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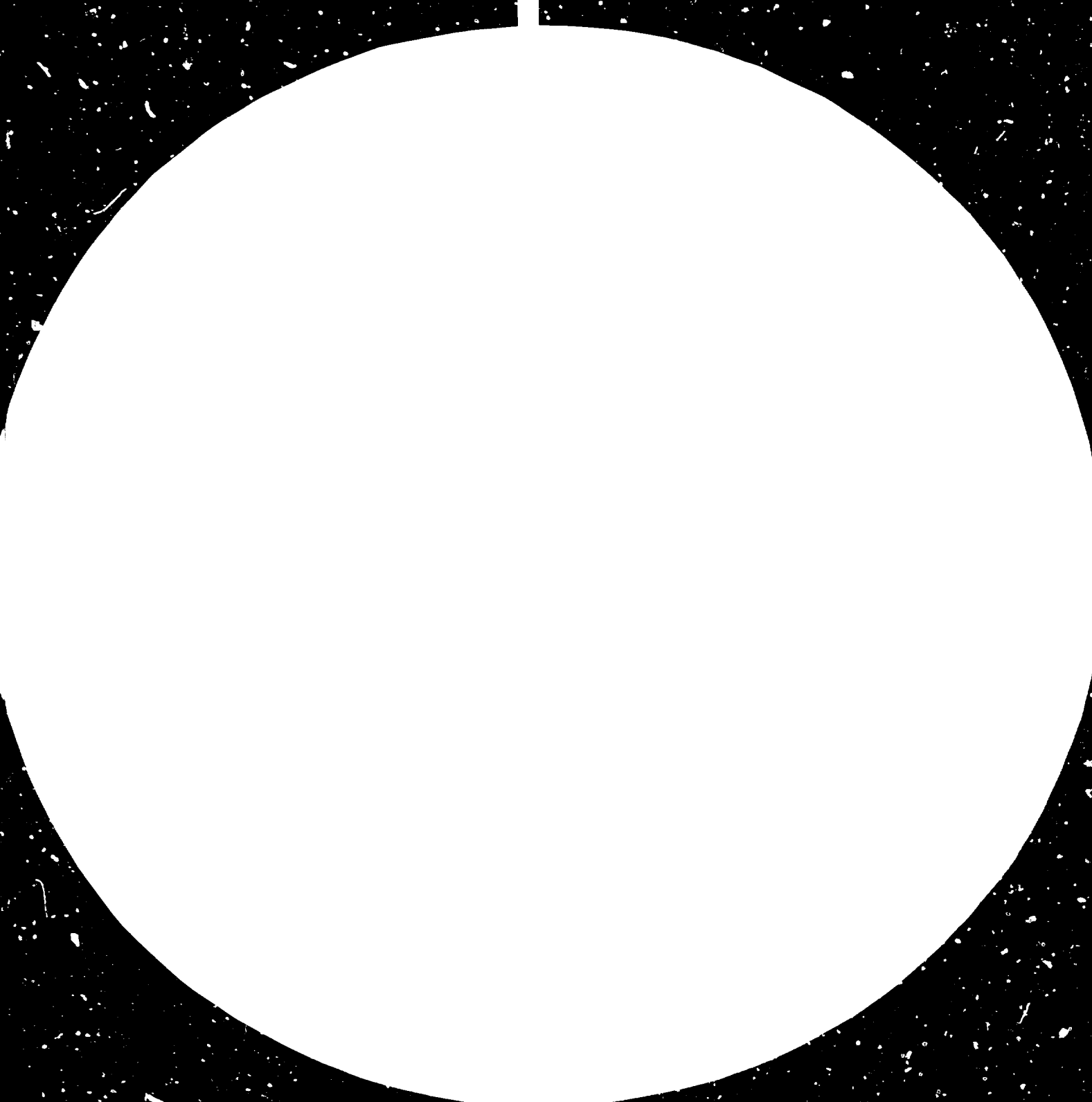
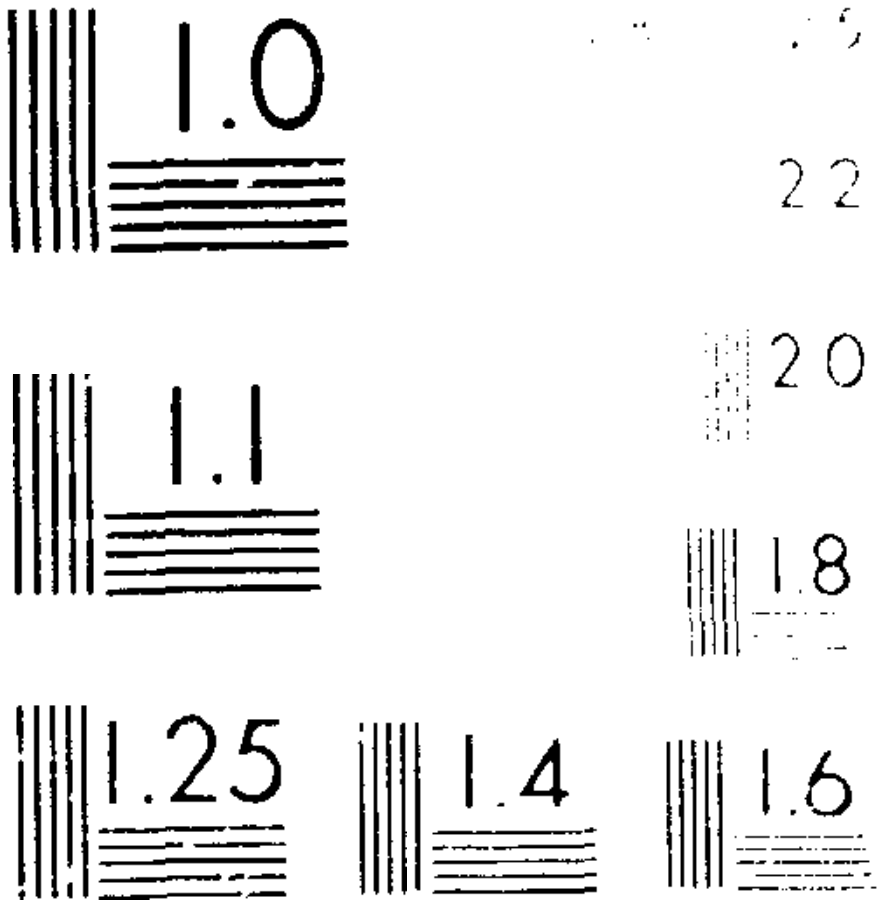
UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

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REVIEW OF INDUSTRIAL DEVELOPMENT IN SIERRA LEONE

S. Shafqat Ali

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Explanatory notes

The monetary unit in Sierra Leone is the leone (Le). During the period covered by the report, the value of the leone in relation to the United States dollar was $US 1 = Le 1.07.

A slash between dates (e.g., 1978/79) indicates a crop year or a financial year.

Use of a hyphen between dates (e.g., 1974-1979) indicates the full period involved, including the beginning and end years.

References to "tons" are to short tons (2,000 lb or 907 kg) unless specified as metric tons (1,000 kg).

The following forms have been used in tables:

Three dots (...) indicate that data are not available or are not separately reported.

A dash (-) indicates that the amount is nil or negligible.

A blank indicates that the item is not applicable.

Totals may not add precisely because of rounding.

Besides the common abbreviations, symbols and terms, the following have been used in this report:

Organizations

International bodies

ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization of the United Nations
GATT	General Agreement on Tariffs and Trade
ILO	International Labour Organisation
IMF	International Monetary Fund
OTC	Office of Technical Co-operation
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization

Sierra Leone Government bodies

CPU	Central Planning Unit (Ministry of Development and Economic Planning)
CSO	Central Statistics Office
FIC	Forest Industries Corporation
NDP	National Development Bank
SLEC	Sierra Leone Electricity Corporation
SLPMB	Sierra Leone Produce Marketing Board

Economic and technical abbreviations

CIF	cost, insurance and freight
FOB	freight on board
GDP	gross domestic product
GNP	gross national product
NDP	National Development Plan
EVC	ethylenevinyl chloride
PVC	polyvinyl chloride

Equivalents

1 mile = 1.609 kilometres
1 square mile = 2.590 square kilometres
1 acre = 0.405 hectares

The "Review of industrial development in Sierra Leone" was prepared by the secretariat of the United Nations Industrial Development Organization (UNIDO) and is based on the work done by S. Shafqat Ali, Project Team Leader of the United Nations Development Programme (UNDP) project "Industrial development programming and project elaboration" (DP/SIL/78/002), for which UNIDO was the executing agency.

Mention of firm names and commercial products does not imply the endorsement of the United Nations Industrial Development Organization (UNIDO).

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DEVELOPING RESOURCE-BASED INDUSTRIES IN SIERRA LEONE

Tables

INTRODUCTION

The project, "Industrial development programming and project elaboration" (DP/SIL/78/002), was carried out for the Ministry of Trade and Industry of the Government of Sierra Leone by experts of the United Nations Industrial Development Organization (UNIDO), acting as executing agency for the United Nations Development Programme (UNDP).

The project was carried out by a team consisting of a junior industrial economist, an industrial engineer and the team leader, S. Shafqat Ali, whose mission began on 1 November 1978 and ended on 23 December 1980. Other short-term experts were also involved in the project.

The purpose of this project was to gather together widely dispersed pieces of industrial information to compose and construct an industrial profile of Sierra Leone on the basis of which a viable and realistic programme of industrial development could be conceived and implemented. The scope of this study included both an appraisal of the existing industrial situation and its foreseeable projection.

An important part of the whole project is, therefore, the industrial review carried out by Mr. Ali with the assistance of the associate expert (the junior industrial economist) and staff members of the Ministry of Trade and Industry. The industrial review deals with the modern sector of Sierra Leonean industry, covering manufacturing, processing and servicing establishments which have fixed assets to the value of 100,000 leone or more, or employ 20 or more workers where machinery is run by motive power. It aims to determine, on the basis of available data, how far existing industry has succeeded in accomplishing national industrialization objectives, to identify the characteristics and problems of existing industry and find solutions to the problems identified, to assess the prospects for development and growth of each individual industry or enterprise, to evaluate the role of foreign investment and devise proposals for its best economic use, to evaluate the ownership and management structure of public-sector enterprises and develop a rational organization for the public sector and, last but not least, to identify the tools of development which the Ministry possesses and can use for the achievement of the national objectives.

The review is presented here in two parts: part one deals with the characteristics, problems and prospects of existing industries; part two, with the development of resource-based industries in Sierra Leone. Conclusions and recommendations are given in detail throughout the review and are summarized at the beginning of each part.

Part one

INDUSTRY, ITS CHARACTERISTICS, PROBLEMS AND PROSPECTS

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Findings

No industrial census has ever been carried out nor has data of any kind been regularly collected from all industrial enterprises. A survey launched for this review proved unsuccessful because of the lack of response from industrial managements and the inability of the Ministry to follow up the postal questionnaire with visits. Consequently, information that became available in respect of around 15% of industrial enterprises has been used as a sample to form certain tentative estimates and to identify, on that basis, characteristics and problems for detailed study.

The tentative statistical picture of Sierra Leonean industry which emerges is shown in table 1 on the next page.

Other statistical indicators are:

(a) Number of establishments employing:

	Number	Percentage
50 or less employees	130	73
51 to 100 employees	28	16
101 to 250 employees	11	6
251 to 499 employees	7	4
500 and above employees	2	1
	178	100

(b) Industrial enterprises

	Percentage
Private sector	76
Public sector	24
	100

(c) Employment

	Percentage
Private-sector industry	51
Public-sector industry	49
	100

(d) Single largest employer of industrial labour: Forest Industries Corporation

Table 1. Basic data on the modern sector of industry, 1979

Industry group	Industrial units (Number)	(%)	Employment (Number)	(%)	Investment (Million Le)	(%)	Gross output value (Million Le)	(%)	Material imports (Million Le)	(%)	Salaries and wages (Million Le)	(%)
1. Food beverages and tobacco	59	33	3 012	27	55.03	50	100.92	52	40.07	38	5.71	40
2. Repair and service workshops	32	18	2 721	25	18.14	16	10.07	6	5.92	5	3.02	21
3. Chemicals, petroleum and refinery products	16	9	592	5	12.57	11	51.55	27	45.52	43	1.20	8
4. Building material industries	16	9	1 037	10	4.08	4	5.35	4	3.15	3	1.15	8
5. Paper products, printing and publishing	16	9	1 017	9	3.08	3	3.20	2	3.00[a/]	3	1.30	9
6. Wood, wood products and furniture	13	7	1 462	13	8.35	7	3.02	1	0.89	1	0.80	5
7. Plastic, rubber and allied products	12	7	419	4	3.60	3	3.48	2	1.49	1	0.55	4
8. Light engineering and metal products	5	3	378	3	2.01	2	4.06	2	3.27	3	0.27	2
9. Textiles and textile products	3	1	209	2	0.62	1	0.75	4	0.19	-	0.21	2
10. Miscellaneous industries	8	4	180	2	3.45	3	4.53		2.66	3	0.12	1
Total	180	100	11 027	100	110.94	100	186.93	100	106.25	100	14.33	100

a/ The import liability of the printing industry includes stationary imported by the government press. No separate figures for these items were available.

(e) Public-sector enterprises known to be owned and managed by:

	Number	Percentage
Statutary bodies	19	43
Government ministries	13	30
Other non-business government organs	4	9
Companies	8	18
	44	100

(f) Enterprise using the largest investment: Sierra Leone Brewery Ltd.

(g) Investment per job created in industry:

	Leone
Maximum	43,457
Average	11,796
Minimum	625

(h) Establishments in which investment per job created is:

	Percentage
Le 20,000 or more	19
Le 10,000 to Le 19,999	16
Le 3,000 to Le 9,999	28
Less than Le 3,000	37
	100

(i) Average investment per industrial enterprise (million Le): 1.56

(j) Capacity of industry to invest annually from its depreciation reserves and profits which can be reinvested (million Le): 13.87

(k) Actual average annual reinvestment from 1976 to 1978 (million Le): 11.09

(l) Reinvestment of depreciation and profit per year (as percentage of total investment): 10

(m) Estimated installed capacity:

	Percentage
Utilized	51
Unutilized	49
	100

(n) Import liability for materials (percentage of gross output value): 56

(o) Salary and wage bill (percentage of gross output value): 8

(p) Estimate of average value added (percentage): 17

(q) Production per employee per year (leones): 16,886

(r) Average emoluments per year per:

	Leones
Employee	1 300
Managerial employee	2 950
Production worker	1 010

(s) Emoluments of managerial employees as a percentage of the total salary and wage bill: 34

Conclusions

1. The process of industrialization in Sierra Leone has completed its first stage, culminating in a somewhat stagnant situation. A new stage has now to be planned and implemented based on the experience gained in the past, the integration of development activity between industry and the primary sectors of the economy, and the creation of new forms of relationship between the Ministry and industry.

2. Industrial information and data are scarce. Consequently, a complete picture of industry and industrial experience gained is not available. This review is the first attempt to piece together the bits of scattered data collected with considerable effort and even this does not represent the complete, accurate and precise picture required for fault-free planning.

3. It is up to the Ministry of Development and its Central Planning Unit to co-ordinate and integrate activities between industry and the primary sectors of the economy. No forum has so far been created to generate integrated planning by bringing together the representatives of the Ministries concerned to pool their thoughts and to combine their resources for the achievement of common goals.

4. The Ministry and the various industries have been running, and continue to run, parallel to each other, not fully aware of the happenings in each other's spheres of operation.

5. Sierra Leone has yet to define the objectives of industrialization. An endeavour has been made in this direction by presenting a new version of the Development of Industries Act. This is an initial step. Continued thinking is needed to realize the objectives outlined.

6. The new objectives of industrialization, which should be vigourously pursued can be summarized as follows:

(a) Replacement of the export of raw materials by export of processed materials;

(b) Local production of industrial and agricultural requirements to the extent which is feasible;

(c) Development of local technological and managerial skills leading to the replacement of expatriate personnel in industry;

(d) Manufacture of goods to meet the primary human needs, i.e. processed foods, building materials, textiles and clothing, medicines and educational supplies;

(e) Development of industry outside Freetown.

7. Sierra Leone has so far followed an outward-looking rather than an inward-looking industrial policy. This has paid the dividends expected. But the existence of an inadequately staffed and equipped Ministry of Trade and Industry has not permitted that Ministry to assume complete control over the direction of industrial development. Consequently, the direction and control of industrial development has to some extent continued to remain in the hands of outsiders. The role of the Ministry has been more or less passive and limited to the award of development certificates.

8. Sierra Leone has still to create and build up the legal, institutional and physical infrastructure required for industrial development.

9. Paradoxically, the scarce personnel resource has been thinly dispersed by creating numerous public agencies and companies to plough public funds into industry, without achieving the results expected.

10. As a consequence of the situation outlined above, the industrialization process has given birth to industry for the sake of industry and none of the objectives outlined in paragraph 6 above have been achieved.

11. An overwhelming dependence on foreign investment and management has led to the following characteristics of existing industry:

(a) A market-oriented, commodity-based structure, geared to producing consumer goods for the limited urban market of Sierra Leone;

(b) A family-oriented ownership structure lacking the broad base of investment required for growth and expansion;

(c) An unbalanced industrial base lacking the capacity to supply even the basic human needs mentioned in paragraph 6 (d) above;

(d) An excessive use of capital-intensive technology, depriving Sierra Leone of the opportunity to exploit its cheap labour resource;

(e) An excessive use of expensive expatriate personnel, depriving Sierra Leoneans of management and industrial experience;

(f) Reliance on imported inputs, causing a poor balance-of-payment situation and an absence of export prospects for industrial products;

(g) Overcapitalization in most industrial enterprises and undercapitalization in others, resulting in higher production costs in the former and production of substandard goods in the latter;

(h) An industrial base created without any regard for forward or backward linkage, resulting in an absence of integration or interdependence;

(i) A great under-utilization of installed capacity, resulting in higher production costs and idle investment;

(j) Concentration of industrial activity in the capital city of Freetown.

12. Another feature is the indiscriminate use of expensive foreign investment, the main purpose of which has been to use industry for the expansion of the import trade. This has resulted in the emergence of small-scale foreign establishments engaged in industries like wheat milling, salt grinding, mixing of paint ingredients, cartridge assembly, mirror polishing, stamping of ethylene-vinyl chloride (EVC) sponge for producing beach sandals and even packaging of imported prepared products.

13. It looks like a blessing in disguise that the current saturation of the import-based sector of manufacturing industry most attractive to foreigners, coupled with the small size of the domestic market for industrial products, has caused a slowdown in growth.

14. The export of Sierra Leonean industrial products through normal channels to neighbouring countries is hampered by the traditionally free in- and outflow of goods, including imported ones, among these countries.

15. The absence of non-tariff barriers, due to the import policy of Open General Licence hitherto followed, has deprived local industry of the full domestic market.

16. The Ministry of Trade and Industry has not so far used, and is still reluctant to use, its regulatory powers over the import business as a lever for opening up new avenues of industrial development.

17. Industry has, by and large, failed to control its production costs enough to become competitive in foreign markets, and is apparently reluctant to do so.

18. The absence of rational ownership and management structures in public-sector enterprises has resulted in a lack of supervisory control, the failure to develop professional management to replace bureaucratic management, over-employment and an inappropriate use of available resources.

Recommendations

1. It is proposed that the measures recommended in chapter 1 of this report to improve the industrial information situation (i.e. an industrial census, continuation of the industrial survey planned and launched by this project, the establishment of a documentation centre and reference library) should be implemented directly or through the Ministry of Development.

2. The Ministry should adopt such measures as are needed to maintain a register of foreign and local, public and private industrial investment and of foreign aid used in the creation of tangible industrial assets.

3. Similarly, the Ministry should maintain an up-to-date record of industrial capacity installed of annual industrial production (enterprise by enterprise and subsector by subsector of industry) as well as of production costs, employment, and import liability.

4. It is recommended that the enactment of the new Development of Industries Act should be vigorously pursued as its coming into force will enable the Ministry to assume direction and control of industrial development, to evaluate the performance of the industrial sector annually and to introduce a system of project evaluation prior to authorizing implementation.

5. In addition to the criteria proposed in the above-mentioned law, the following aspects of each new project should also be evaluated before authorization:

(a) Investment per job created or likely to be created;
(b) Import cost per year of maintaining each person in employment;
(c) Assessment of domestic market and export prospects.

6. The Ministry of Trade and Industry should be reorganized and strengthened on the basis of proposals already presented and discussed.

7. A study group composed of the representatives of each industry and the relevant government agencies should recommend measures to improve capacity utilization through product and market diversification.

8. The possibility of replacing the excise duty on goods produced by a capacity tax could be evaluated as a measure to ensure capacity utilization.

The import of competitive goods could be controlled and restricted subject to retail prices in the domestic market, and export performance should be guaranteed by each enterprise concerned.

9. The possibility of penalizing enterprises which keep their industrial plants shut down for indefinite periods without any genuine reason, should be explored.

10. The following plants, which are lying idle, should be completed and put into operation:

(a) The toilet soap plant in the Washex soap factory;

(b) The canvas and rubber shoe plant in the footwear factory on the Wellington Estate.

11. The ownership base of industry should be broadened by enabling the National Development Bank to expand its programme of equity participation and by establishing a stock exchange.

12. To correct the imbalance in the industrial base, projects should be developed and implemented for the establishment of a textile mill, a tannery, and for engineering and building-materials industries.

(a) It is proposed that UNIDO be requested to find a foreign investor for the textile mill;

(b) A private concern should be asked to present a project for the establishment of a tannery;

(c) As regards engineering and metal-products industries, three different options have been worked out as follows:

(i) The establishment of a small industries estate for light-engineering industries on the vacant land available at the National Workshop;

(ii) The conversion of the National Workshop into a complex of light-engineering industries, or

(iii) The modernization and expansion of the National Workshop.

Details of these options are given in chapter IV and it is proposed that the relevant paragraphs should be presented to the Ministry of Communication as well as to the chairman of the caretaker committee of the National Workshop. Once an option has been selected, it will be possible to work out detailed plans for its implementation;

(d) As regards the building-materials industry, it is proposed that a committee consisting of the representatives of the National Workshop, the clay-brick factory, the construction industry and the Ministry of Works should be formed to review the entire situation and to propose items to be manufactured in order of priority and measures to be taken for the implementation of the programme recommended.

13. Prospects for growth and development of each individual enterprise have been identified and presented in chapter IV. It is recommended that the enterprises concerned should study and discuss them with the Ministry.

14. The following proposals should be considered (they are given in detail in chapter V of this report):

(a) The establishment of an Industrial Free Zone;

(b) The introduction of a scheme for foreign investment in industry on a pay-as-you-earn basis;

(c) The development of resource-based industries by making concessions for extractive operations in the fields of minerals, forestry and fisheries dependent on the establishment of industrial projects for the utilization of the resource leased;

(d) The authorization of foreign investment on a joint-venture basis in areas and fields outside the sphere of the foregoing three proposals.

15. The following recommendations are made to rationalize the ownership and management structure of industry in the public sector: (see chapter VI)

(a) The Ministry of Trade and Industry should establish a separate section for the development of public-sector industrial projects, performance evaluation of each enterprise, and to resolve problems requiring solutions at ministerial or cabinet level;

(b) The following three agencies should be reorganized to function as holding agencies for the investment of public funds in industry;

(i) The National Development Bank (NDB)

(ii) The Forest Industries Corporation (FIC)

(iii) The Sierra Leone Produce Marketing Board (SLPMB)

These agencies could operate as headquarters for the public-sector enterprises and be responsible for exercising the required supervisory control;

(c) A public company should be established for each industrial enterprise in which public funds are invested by any of the holding agencies nominated for this purpose;

(d) A uniform system of industrial management and accounting should be developed for all public-sector industrial enterprises. For this purpose, the assistance of a UNIDO management consultant might be sought.

It is recommended that the proposals outlined in chapter VI should be sent for comments to the Ministry of Development, the Ministry of Finance, the Bank of Sierra Leone, the Ministries of Government engaged in the ownership and management of public-sector industrial enterprises and the proposed holding agencies. Upon receipt of comments, the Ministry might form a committee responsible for drawing up a detailed plan.

16. The following recommendations for the Ministry of Trade and Industry have been outlined in chapter VII:

(a) The Ministry should assume responsibility for the preparation of the development budget for the industrial sector and use this for ensuring the achievement of physical targets related to the completion of industrial projects in the public sector;

(b) The Ministry should redesign its foreign trade policy to become a production-, development-, and export-oriented policy.

I. INDUSTRIAL INFORMATION IN SIERRA LEONE

An appraisal of the industrial situation and its projection requires not only data on existing industry and industrial plans but also on the primary sectors of the economy, on managerial and industrial skills, on capital formation and market prospects. Thus, a wide range of information is needed before a meaningful analysis can be made.

Industrial information is a rare commodity in developing countries and Sierra Leone is not an exception to this. An appraisal of the industrial information situation is therefore the first necessity and the proposal of measures to improve this situation is one of the primary objectives of this study. This chapter is dedicated to the achievement of that objective.

A. Primary sources of industrial information

Industrial establishments constitute the primary source of industrial information. This primary source can be adequately tapped for information only in those developing countries where some control is exercised over industrial development. The industrial sector in Sierra Leone is still not subjected to any regulation. The only industrial law of the country is the Development Act of 1960, the prime object of which is to offer tax concessions to attract foreign investment. There is no law or even executive order under which factories established are registered by the Ministry of Trade and Industry. There is no agency which oversees the performance of industry. There is no definition of industry (small, medium or large).

Sierra Leone has modern factories and the number of these is well over 100. Owned mostly by limited companies (incorporated structure), these are managed mostly by expatriates capable of maintaining proper records of their operations. Despite this capacity to provide information, these enterprises are among the least willing to do so. To ask for information is often to annoy or displease the owner or owner-manager of some of these establishments.

Lack of capital and the absence of national entrepreneurial experience has obliged Sierra Leone to rely heavily on foreign investment for industrial development. This "open-door policy" necessitated the minimum possible interference in the establishment and subsequent management of industrial enterprises.

Information control has been considered as something counter-productive and a deeply-rooted tradition of non-interference has developed which makes the management of these enterprises reluctant to respond to calls for information. But things have to change. The Ministry of Trade and Industry has now to keep a record of the performance efficiency of the industrial sector, must identify and grapple with industrial problems, determine the recurring import liability of the industry, assess the prospects for its growth and facilitate the achievement of this growth. This necessitates a complete change and makes it imperative for the Ministry and industry to develop a new and closer relationship based on mutual co-operation.

The expert visited 21 factories in November 1978 and made an on-the-spot study of the situation. Discussions were also held with the management of these enterprises. As a result of this:

(a) The draft of a new Development of Industries Act was prepared, to define and establish a closer relationship of give and take between the Ministry and industry;

(b) An industrial survey was planned for which a questionnaire was designed, a universe of 180 factories was established and the questionnaire sent to these factories for completion and return by February 1979.

The draft law is under active consideration. As regards (b) above, only four out of 180 factories responded. Since the survey is of paramount importance for the design of the Ministry's new role in the field of industrial development, it is not proposed to give up the endeavour but to pursue the matter further.

B. Secondary sources of industrial information

The secondary sources of industrial information in Sierra Leone are as follows:

(a) Central Statistics Office;

(b) Ministry of Development and its Central Planning Unit;

(c) Ministry of Trade and Industry;

(d) Public-sector agencies engaged in the field of industrial development or concerned with the economic and industrial situation of the country;

(e) Ministry of Labour;

(f) Ministries and agencies of Government engaged in the development of the primary sectors of economy such as agriculture, forestry, fisheries and mining.

In addition, there are the reports of foreign experts, in particular United Nations experts, feasibility reports prepared by consulting firms, and the reports delivered to the Government by United Nations and other aid-giving agencies on the economic and industrial conditions of Sierra Leone. Access to most of these reports is difficult.

1. Central Statistics Office

Surveys and census taking involve highly professional skills in planning, data collection, tabulation and documentation on various aspects of the development of a country. This is the responsibility assigned to the Central Statistics Office (CSO) established in Sierra Leone. Although equipped with a computer, the CSO in Sierra Leone is not adequately staffed and this has limited its activities to the compilation of foreign trade statistics and the national income accounts.

The CSO has a population census unit which has yet to compile and release data from the census taken in 1974/75.

The CSO carried out an agricultural census in 1971/72 and has released a very valuable and informative report on the conditions of agriculture in Sierra Leone.

No industrial census of the organized sector of industry has ever been planned or undertaken. Nor does the CSO collect basic data on this sector of industry annually. The CSO has now, on the recommendation of the UNIDO project, agreed to undertake such a census.

A UNDP/OTC project, operating within the CSO, plans to undertake a survey of the small-industries sector. The sampling design and the questionnaire for this survey have been finalized.

CSO reports on foreign trade statistics and the national income accounts, as well as those on the agricultural census, have become available and these are also used for this study.

The CSO has to be more fully staffed and supported to achieve its objectives, particularly in the industrial field.

2. Ministry of Development and Economic Planning

This Ministry is both a producer and consumer of industrial information. The Ministry has a Central Planning Unit (CPU) supported by a UNDP/OTC team of experts. The unit is engaged in the formulation of periodical national plans, evaluation of plan implementation, and preparation of the annual development programme and development budget. To provide statistical foundations for all these documents, the CPU is supported by a data-planning and procurement unit and a reference library. There is a need to complete this establishment by adding a documentation unit to store well-classified and documented information for the users. In the absence of such a unit, it is difficult for an outsider even to know what information is available from this Ministry.

Almost all development projects are received in the Ministry for clearance. These are supported by feasibility or expert studies based on data. Similarly, aid-giving agencies and countries periodically send missions to determine the areas of assistance needed and to devise viable projects. The reports compiled by these missions provide industrial information of immense value for the users. If the data available in these projects and reports were classified and stored as proposed, a useful system of economic and industrial information would emerge to facilitate planning not only in this but also in other Ministries and agencies of Government.

The CPU depends on the CSO and the other secondary sources of information mentioned above. However, the CPU has also established direct contact with the primary sources of industrial information. The CPU and the CSO are both arms of the Ministry of Development. It would therefore have been more appropriate to strengthen the CSO and to improve its data-planning and procurement functions than to duplicate them, as the CSO is a professional organization more capable of meeting the needs of the users.

The CPU has established a universe of 36 factories for its data collection. Not only is this a rather small universe but also the criteria on the basis of which this universe has been established are not shown. As many as five forms have been designed for data collection and one for tabulation.

The CPU does not collect data on industrial capacity or on investment. The absence of the former makes the use of production data for the assessment of capacity utilization rather difficult, and the absence of the latter deprives the CPU of an opportunity to determine investment growth in the industrial sector.

Questionnaires designed for specific use do suffer from such inadequacies. If a professional organization like the CSO had been strengthened to perform this role the results would have served the interest of the CPU and also other users.

The position at present is that only 18 out of the 36 factories contacted by the CPU respond. The quality of the data received is far from satisfactory. Despite these comments, the Ministry of Development and its Central Planning Unit is the only real source of industrial information. The purpose of this appraisal has not been to offer criticism but to indicate how this source can be further developed and strengthened.

3. Ministry of Trade and Industry

This Ministry, which is expected to be the most active and most significant producer, user and keeper of industrial information, has not yet fully achieved this position. Emphasis, up to now, has remained on foreign trade and commercial development. Whereas the Ministry has remained the most active participant in this field, it has still to identify and perform its role fully in the industrial development of the country.

In Sierra Leone, a number of industrial projects have been carried out on the basis of bilateral assistance from friendly countries. Such assistance is generally provided after feasibility studies are carried out. However, copies of these feasibility studies, or any other data on these projects, are not readily available.

The Ministry of Development compiles the annual development programme and development budget on the basis of information and proposals received from various Ministries and agencies. The Ministry of Trade and Industry has to compile the budget for the industries sector. But it appears that budgetary proposals for several industrial projects are received directly by the Ministry of Development from the project-execution agencies. In a paper separately presented to the Ministry of Trade and Industry, it has been proposed that this Ministry be allowed to play a centralized role in the formulation of programmes and budgets for the industrial sector. This would enable the Ministry to have access to information on the projects outside its fold.

In 1974, the Ministry decided to collect some basic data about private industry. A universe of 86 factories was established and a questionnaire was mailed to these factories The information was to be supplied on a quarterly basis. However, industry did not co-operate and the files of the Ministry are full of reminders to industrial enterprises who did not even reply. The CPU in the Ministry of Development has been more successful than the Ministry of Trade and Industry because the former has more staff and mobility. But the Ministry of Trade and Industry has a lever which has never been applied. If the Ministry had made the issue of licences dependent on the receipt of information, the information would surely have been received. Anyhow, the data voluntarily supplied by the industrial enterprises has been studied. Although the quality of the data is poor and the quantity inadequate. the information has been used wherever possible in constructing the industrial profile of Sierra Leone.

These sporadic endeavours by the CPU, the Ministry of Trade and Industry and the UNIDO project within the Ministry do not present a proper and permanent solution to the problem of industrial information. The situation should improve with the passage of the new Development of Industries Act which will require presentation of all industrial projects (whether in the public or private sector) for approval by the Ministry, registration of existing industrial establishments and the supplying of information by the promoters of new projects and the managements of operating ones. However, what will still need to be done is an annual census of all industrial establishments registerable under the proposed Development of Industries Act. This census has to be carried by the CSO and this will relieve both the CPU and the Ministry of Trade and Industry of the need to chase industrial establishments for the collection of data. For this purpose, it is proposed that the scope of the UNDP/OTC project in the CSO be expanded to cover the work of the census and that the CSO has to be adequately staffed and supported to do this. The CSO will, of course, devise the questionnaire in consultation with the users of the data.

4. Public-sector agencies engaged in the field of industrial development

The following ministries and agencies engaged in the field of industrial development are also vital sources of industrial information:

(a) The National Development Bank. This Bank is a producer as well as user of industrial information. The Bank releases an annual report on its operations which provides adequate data for any macro-study. The Bank also

keeps a record of projects appraised and provides information for micro-studies to authorized personnel. Thus the CPU and the National Development Bank (NDB) are the two major sources of industrial information in Sierra Leone;

(b) The Bank of Sierra Leone. This Bank is the most important source of information on financial and monetary policies. It has a research department which collects and processes economic and industrial information;

(c) The Forest Industries Corporation. The Corporation releases an annual report on its operations which provides adequate data on its own operations but not on the forestry sector as a whole;

(d) The Sierra Leone Produce Marketing Board. This is a primarily commercial organization but it operates as many as eight palm-oil mills and one palm-kernel oil mill;

(e) The Rice Corporation. This is another commercial organization which operates rice mills. It has provided data on rice imports but provides little data on local production of rice or paddy processed in its own mills. The Corporation has now been merged with the Sierra Leone Produce Marketing Board;

(f) Other bodies such as the Ministries of Agriculture and Social Welfare. These Ministries, it appears, have rather limited information on their respective industrial operations. The former looks after the sugar-mill project and the fruit-canning project. The latter runs the baby-food plant at Bo;

(g) The National Workshop. The rehabilitation phase of the workshop is not yet complete and plans for its use and expansion have still to be worked out.

5. Ministry of Labour

This Ministry maintains a register of factories which is designed to supply data on employment and the steam-generation capacity installed. If 'power installed' were also included, the scope of information available from this Ministry would be broader.

In constructing the universe of Sierra Leonean industry, data from the registers of this Ministry were used. It was found, however, that at least 25% of existing factories do not appear on these registers.

The Ministry should have a record of information on industrial relations and vocational training but no publication or processed data has so far been released on the subject. The only source of information is the ILO reports.

6. Ministries responsible for the development of primary sectors of the economy

These ministries produce information on the existing and projected situation of industrial materials such as agricultural produce, minerals, forestry produce, fisheries etc. These ministries also manage and run industrial plants. Unfortunately, organized statistics are scarce.

C. Conclusion and recommendations

Industrial information in Sierra Leone is widely dispersed, inadequately recorded, processed and released. The Ministry of Trade and Industry has still to develop a system for organizing the flow of industrial information required for industrial planning, industrial management and the formulation of industrial policies. To improve the situation, the following measures are recommended:

1. The performance-efficiency survey of industrial establishments launched by the Ministry of Trade and Industry on 15 January 1979 must be vigorously pursued and should be carried out regularly every year.

2. The co-operation of both public and private industry with this survey should be ensured, either by issuing a strongly-worded directive, or by using the lever of withholding import licences until the information required is made available, or both.

3. A team of two officials should visit the factories to give assistance to the management in filling up the questionnaire already sent and to collect the completed forms.

4. The formulation of the annual industrial development programme and development budget should be centralized in the Ministry of Trade and Industry and, for that purpose, the public-sector industrial enterprises, whether or not under the control of the Ministry, should be required to provide the Ministry with a performance report on the outgoing year and targets planned for the incoming year.

5. Plans should be drawn up for an industrial census of the factories registerable under the proposed Development of Industries Act in collaboration with the CPU and the CSO. The CSO should be authorized and equipped to undertake this census on a regular basis. For this purpose, the scope of the UNDP/OTC project in the CSO might be expanded.

6. A proposal should be drawn up for the establishment of a documentation unit in the Ministry of Development.

7. A complete system for gathering industrial information should be devised in collaboration with the Ministry of Development and other ministries and agencies of Government operating in the field of industrial development.

8. The field officer in the Ministry could be provided with transport facilities, thus enabling him to visit the factories to obtain the data required.

II. THE INDUSTRIAL BASE OF SIERRA LEONE

A. Broad classification of industry

Industry in Sierra Leone can be broadly classified into the traditional sector and the modern sector. These two sectors of industry are distinguishable from each other on the basis of investment, technology and employment.

1. The traditional sector of industry

This sector of industry includes family- and cottage-type industrial units engaged mostly in the processing of agricultural produce (i.e. rice hulking and palm-oil processing), handicrafts based on specialized skills, and small industrial enterprises using mostly traditional technology and equipment. This sector is the largest employer of industrial labour in Sierra Leone. It produces, in order of importance:

Palm oil
Husked rice
Sawn timber
Smoked fish
Tailored clothes
Wooden articles
Blacksmith products
Straw mats, hats and basketry
Hand-spun, hand-woven cloth
Bakery products
Jewellery
Gara prints on cloth
Carved products, wood and ivory
Shoes

Investment per establishment is negligible and production in most cases [illegible] to meeting the consumption needs of the family or village or a [illegible] of villages. Handicrafts of wider commercial value are basketry, gara printing, hand-loom cloth and carved products of wood and ivory. Tailoring is the most popular urban trade.

Employment in this sector of industry as assessed through a sample survey carried out by a team of experts from the University of Michigan is considerably higher than the 39,577 recorded during the population census of 1974. Value added per unit of output in the traditional sector of industry is always higher because of the labour-intensive technology used. The large volume of traditional-sector industry, therefore, makes a sizeable contribution to the gross domestic product (GDP).

The size and importance of this sector to the economy required a separate study which was carried out by Asghar S. Nasir, industrial engineer of the project, and was presented separately. This report therefore excludes a review of this sector of industry.

2. The modern sector of industry

The National Development Plan (NDP) (1974/75 to 1978/79) defines the modern sector of industry as covering establishments which fulfil two of the three following criteria:

Capital	Le 50,000
Annual output	Le 100,000
Employment	11 or more persons

This definition has been recently reviewed and the new draft of the Development of Industries Act now provides the following agreed definition on the basis of which a distinction can be made between the traditional and the modern, factory-type sectors of industry:

> "An industrial establishment engaged in the production of consumer or producers' goods or services, using fixed assets to the value of Le 100,000 or employing 20 or more workers where industrial machinery and plant is run by motive power."

This definition covers large, medium and small industrial establishments provided these are operating on the pattern of a factory. This also covers repair and service workshops which fall outside the scope of the NDP definition. The new definition does exclude a few very small factories, but for the purpose of this report, these have also been listed so as to make the picture of Sierra Leone's factory-type industry more complete.

B. Sources of information used and data obtained

The foregoing chapter described the scarcity of industrial information. An industrial survey was planned and launched to fill this gap but this has so far produced few results. Accordingly, it has been decided to use the available secondary sources. These are:

(a) The national accounts (published by the CSO) which provide data on the contribution made by the industrial sector to the GDP;

(b) The National Development Plan (NDP) (1974/75 - 1979/80) which provides macro-data relating to the industrial sector;

(c) Data available from the Central Planning Unit of the Ministry of Development in respect of 18 establishments. This provides actual figures covering the second half of 1975, the full year of 1976, forecasts for 1977 in full and the first half of 1978. Data covers production, consumption of imported materials, operating costs in local currency, employment and wages, and capital expenses incurred or to be incurred during the reporting period;

(d) Data collected by the Ministry of Trade and Industry in the form of quarterly returns. In addition to the items listed at (c), this covers investment and capacity, but there are only very few establishments which have provided data for all the four quarters of any one year. The response in general has been very poor;

(e) Employment data available from the Ministry of Labour;

(f) Questionnaires (six in all) received back duly completed as part of the industrial survey planned by the expert and launched by the Ministry of Trade and Industry;

(g) Information gained in the course of an initial visit by the expert to 21 factories on his arrival in November 1978 and data of a general nature available in the reports compiled by the United Nations and other international bodies.

1. Data used for the preparation of the first NDP for the industrial sector

The National Development Plan uses the following data for its formulation:

(a)	Total industrial investment in 1973/74, (depreciated value of capital assets)	Le 17.5 million
(b)	Gross output value in 1973/74,	Le 57.4 million
(c)	Employment in 1973/74.	3,600 persons

The industrial situation identified by the authors of Sierra Leone's first plan is based on the NDP definition of modern industry given under section A, paragraph 2 above.

The source of this data is not revealed in the plan although it is stated that an industrial survey was carried out, the scope of which was limited to the manufacturing sector by excluding both the processing and servicing industries. It further appears that the gross output value was estimated on the basis of the value added, shown as the contribution made by the industrial sector to the national GDP, compiled annually by the CSO.

2. Industrial performance as reflected in the national accounts

Sierra Leone has yet to undertake an industrial census to identify the universe of the modern as well as the traditional sectors of industry. In the absence of such a census, the contribution made by industry to the GDP, as reflected in the national accounts, is apparently an estimate without a known base. It is possible that, like the CPU of the Ministry of Development, the CSO has also picked a random sample of some manufacturing establishments to reflect their value added in the national accounts. However, a random sample without an identified universe is of limited value. Whatever the methodology used to assess the contribution made by industry to the GDP, the national accounts do provide some meaningful indicators of the performance of the industrial sector.

The table that follows reflects the contribution made to the GDP by:

(a) The industrial sector as a whole;
(b) The modern and the traditional sectors of industry separately.

To show the significance of the national accounts data, the average annual growth rate of the contribution made to the GDP has been worked out as a percentage and is shown in this table.

The national accounts therefore reveal that, although the contribution made by the modern sector of industry to the national GDP had grown over this 4-year period at a rate more than double that of the traditional sector of industry, the traditional sector has remained the major contributor. Its contribution (at factor cost) to the national GDP in 1976/77 formed 58.2 per cent of the total contribution made by the whole industrial sector.

Table 2. Contribution made by the industrial sector to the GDP

Basis of contribution made to GDP	1972/73 (millions of leone)	1976/77 (millions of leone)	Increase in value added over this period (millions of leone)	Increase in value added over this period (percentage of 1972/73)	Average annual growth (percentage)
(a) Whole industrial sector:					
At producer's value	32.2	52.1	19.9	61.8	12.8
At 1972/73 prices	32.2	41.6	9.4	29.2	6.6
At factor cost	21.3	35.4	14.1	66.2	13.6
At 1972/73 factor cost	21.3	27.5	6.2	29.1	6.6
(b) Modern and traditional sectors separately:					
Modern sector at factor cost	7.3	14.8	7.5	101.9	19.2
Traditional sector at factor cost	14.0	20.6	6.6	47.1	10.1

Performance of the modern sector by industry group. The data provided in the national accounts reflect the following indicators of value added growth by industry group during the period 1972/73 to 1976/77:

Industry group	Average annual increase (Percentage)
Wood and wood products	39.1
Paper products and printing	37.4
Chemicals, petroleum and plastics	28.3
Beverages and tobacco	20.7
Textiles and leather	10.2
Metal and allied products	1.7
Food products (excluding beverages and tobacco)	1.4

In 1972/73, the base of timber and wood-processing industries as well as that of the paper-products and printing industries was negligible. Consequently, the rate of annual growth assessed on that base appears high.

In the case of the chemicals, petroleum and plastics sector, some large new plants were constructed in Sierra Leone during the period under review.

The national accounts reflect negligible growth in the contribution made to the GDP by the other four sectors during the period udner review.

Performance of the traditional sector by industry group. This, when computed in percentages, reflects the following situation:

Industry group	Average annual increase (Percentage)
Tailoring	11.1
Textiles	10.7
Woodwork	10.7
Metal products	10.7
Edible oil- and rice-milling	8.4
Others	10.1

In the case of rice and palm-oil milling the contribution made to the GDP is assessed on the basis of rice and palm-fruit harvest data. As regards the remaining sectors, the growth shown apparently reflects expert estimates by the CSO.

3. The value of data from the NDP and the national accounts

The first National Development Plan of Sierra Leone and the national accounts compiled by the CSO do not reveal how the sample was chosen or the universe of Sierra Leonean industry identified, but they do provide valuable indicators of the industrial situation prevalent in those years.

For instance, both these sources of information confirm that there has been negligible growth in certain sectors such as textiles, leather, metal products and processed-food industries. They also highlight the positive growth that has taken place in the fields of industries based on forestry produce printing and publishing and chemical and petroleum refinery products.

C. Identification of the universe of the modern sector of industry

A study of the industrial base of Sierra Leone requires, in the first place, that the whole universe of the modern sector of industry should be clearly established.

This universe has been identified as consisting of 180 industrial establishments, most of which appear to comply with the definition of modern industry (see section A, paragraph 2 above) used as the basis for this study. All the enterprises in this universe are listed in annex I.

The major source of information used to identify this universe was the Ministry of Labour's factory registers for each province. Despite the official nature of this source, there is some doubt as to whether all the information is accurate and up-to-date and it can only be taken as a tentative base until such time as every establishment in this universe can be checked by the proposed industrial census.

This universe includes:

(a) Forty four factories not shown on the registers of the Chief Inspector of Factories (the existence of these factories was confirmed by other authentic sources of information which, however, could not provide the number of employees in each factory. The number of employees, as shown in the universe in annex I, has been estimated on the basis of an average per unit of the factories in the group or sub-group of industry to which it belongs);

(b) A few factories which do not fulful the employment criterion in section A, paragraph 2. (These have been included to give as complete a picture of the industry concerned as possible);

(c) Some industrial establishments lying closed;

(d) Two industrial plants which have disappeared.

The inclusion of (c) and (d) above has been considered necessary to provide the historical background of the industry concerned.

This universe excludes a number of establishments employing 20 or more workers and shown on the registers of factories mentioned above. Investigation proved that these were either firms of contractors or overwhelmingly commercial establishments with little industrial basis.

The universe identified covers all types of industries, manufacturing, processing and servicing. In the case of servicing industries, it includes cold-storage firms, repair and servicing facilities and even mechanized laundries, but excludes hotels and tourist enterprises.

1. Classification of industries by group

The Ministry of Trade and Industry at present uses a classification which divides industry into eight groups. This classification has been adopted for this study with slight modifications which result in two further groups.

The Ministry's classification includes a 'metal products' group. From this group, the enterprises engaged in the productions of steel frames for doors and windows have been excluded and shifted to the 'building materials' group. A new group has been introduced to cover "repair and service workshops", hitherto not considered as an industry. This group includes those repair and service workshops which also produce bodies for buses and trucks.

Similarly, furniture was found distributed between two groups, "metal products" and "wood products." Since most of the furniture workshops use wood as a basic material, furniture is here included in the "wood and wood products" industry group.

Another industry group, "miscellaneous", has been created to cover those establishments which cannot be placed in any specific group. These ten groups are further analysed below.

2. Industry group by number of establishments and employment size

This is reflected in the following table.

Table 3. Number of establishments and employees in each industry group

Industry group	Establishments		Employees	
	(number)	(percentage)	(number)	(percentage)
1. Food, beverages and tobacco	59	33	3 012	27
2. Repair and service workshops	32	18	2 721	25
3. Chemicals, petroleum and refinery products	16	9	592	5
4. Building material industries	16	9	1 037	10
5. Paper products, printing and publishing	16	9	1 017	9
6. Wood, wood products and furniture	13	7	1 462	13
7. Plastic, rubber and allied products	12	7	419	4
8. Light engineering and metal products	5	3	378	3
9. Textiles and textile products	3	1	209	2
10. Miscellaneous industries	8	4	180	2
Total	180	100	11 027	100

This table makes clear the imbalance in Sierra Leone's industrial base. This is shown in:

(a) The absence of tanning and leather-goods industries;

(b) The very few establishments involved in the fields of textiles, light engineering, building materials and resource-based industries.

It is obvious that textiles, tanning and leather-goods industries are needed to produce essential consumer goods for the population. Their absence from the industrial base of Sierra Leone reflects one of its serious shortcomings.

Light-engineering industries provide a training in the skills needed for all types of industrial development, but Sierra Leone has only five small-sized light-engineering establishments. These produce nails, springs, buckets and metal-block frames for use in the production of cement blocks. The only immediate hope is the development of the National Workshop. This is a maintenance shop and its transformation into a complex of light-engineering industries requires both investment and market research to identify the production lines which should be developed.

Building-material industries are few. They consist of one cement-clinker grinding and bagging plant lying idle for several years, one clay-brick factory which is still not free from teething troubles, a few cement-block enterprises, two firms producing floor tiles, and seven concerns producing metal frames for doors and windows. This is a very important industry group as the success of development endeavour in general and the growth of the housing sector in particular depend on its expansion and performance.

Resource-based industries are in the initial stage of development. These, at present, include two fish-freezing plants, a palm-kernel oil mill, a few palm-oil and rice mills, a few sawmills and a fruit-processing plant recently established. A small sugar mill is in the process of being established. Sierra Leone needs a planned effort to correct this imbalance in its industrial base.

3. Establishments by employment-size groups

The 180 industrial establishments in the universe can be further classified into the following employment-size groups.

Number of employees	Group designation
500 or more	A
251 to 499	B
101 to 250	C
50 to 100	D
Less than 50	E

The following table distributes the industrial establishments by employment size in each industry group. Two closed down factories have been omitted and the total industrial units in the table is therefore 178.

Table 4. Number of industrial establishments by employment size, within each industry group

Industry group	Number of establishments in each					Total
	A	B	C	D	E	
1. Food, beverages and tobacco	-	3	2	8	45	58
2. Repair and service workshops	1	2	3	5	21	32
3. Chemicals, petroleum and refinery products	-	-	1	2	13	16
4. Building material industries	-	1	1	2	11	15
5. Paper products, printing and publishing	-	1	1	2	12	16
6. Wood, wood products and furniture	1	-	2	2	8	13
7. Plastic, rubber and allied products	-	-	-	3	9	12
8. Light engineering and metal products	-	-	1	-	4	5
9. Textiles and textile products	-	-	-	2	1	3
10. Miscellaneous industries	-	-	-	2	6	8
Total	2	7	11	28	130	178
Percentage	1	4	6	16	73	100

This table reveals that:

(a) 73% of industrial establishments in the universe are of small size, employing 50 or less persons;

(b) 89% employ less than 100 persons;

(c) Only 11% (20 in number) employ more than 100 persons.

These 20 establishments appear to be of interest and, as such, their identification is of significance. These are as follows:

Food, beverages and tobacco

Sierra Leone Brewery Ltd.
Palm Kernel Oil Mill
Aureol Tobacco Co. Ltd
National Confectionery Ltd (NATCO)
Ouman Thomas Salt Project

Repair and service workshops

Workshop of the Directorate of Road Transport
Workshop managed by Road Transport Corporation
Société Commerciale De Louset Africain
Workshop of the Ministry of Agriculture
Workshop of the Ministry of Works
Workshop of Port Authority at Cline Town

It is apparent that these large workshops are primarily responsible for maintaining the transport fleet of the country on the road. Their capacity to provide a foundation for the development of an automotive industry of any kind or size is limited.

Chemicals, petroleum and refinery products

Petroleum Refining Co. Ltd.

Building material industries

Sierra Leone Clay Bricks Industries Ltd., Freetown (still having teething troubles)
Sierra Leone Cement Works Ltd., Freetown (lying idle)

Paper products, printing and publishing

Sierra Leone Government Printing Press
Daily Mail Press

These are, by and large, responsible for the maintenance of educational supplies, supplies of administrative stationary, and journalistic activities of the Ministry of Information. The Government Printing Press is under expansion.

Wood, wood products and furniture

Forest Industries Corporation (under expansion)
Pangama Saw Mills Ltd. (recently expanded)
Sierra Leone Timber Industrial and Plantation Co.

Light engineering and metal products

National Workshop, Freetown (under rehabilitation and transformation from a maintenance shop to a production shop)

Most of these 20 large enterprises provide a sound base for development. In fact, in some cases action is already under way. For instance, the Palm Kernel Oil Mill is establishing an edible-oil refinery to cut down the import of cooking oil of all kinds.

The brewery has drawn up a plan for its expansion, although details are still awaited. However, the utilization of brewery mash for yeast production is likely to be included in the expansion programme.

Aureol Tobacco has recently completed its expansion, raising its capacity by 29 per cent.

National Confectionery Ltd. is expanding lollipop and confectionery production.

A feasibility study for the expansion of the solar salt plant to raise its present capacity from 6,000 to 25,000 tons per year has already been carried out. Progress is being held up by difficulties in financing. It is also feared that the investment cost of the infrastructure is very high, requiring a review of its feasibility.

The petroleum refinery has to concentrate for several years to come on its problem of capacity utilization. Unless Sierra Leone establishes energy-based

industries such as a glass factory, a ceramic plant, production of structural steel from locally-available scrap, and plants which use oil as a carrier or diluent as in insecticide, cosmetic and aromatic production plants, the refinery will not be able to fully utilize its present installed capacity.

The forestry complex of industries is being assisted by the Federal Republic of Germany and its expansion is already planned. This is reported to include a veneer and plywood plant and particle board plants.

The National Workshop has a team of experts from Hungary on its staff to plan commercial production of items still to be chosen. The management of the clay-brick factory has changed hands and it is expected that the new management will prove more effective. It is very necessary to reactivate the cement-clinker grinding plant and the Ministry should ensure this.

The foregoing table further reveals that, whereas the private sector has chosen small industry and import substitution for investment, the public sector has devoted itself to the development of large-scale resource-based industries. Eleven out of the 20 large-scale projects identified here were either entirely or partly established through public investment.

D. The ownership structure of Sierra Leonean industry

The universe given in annex I, and the sample of Sierra Leonean industry described in section E below, do not offer data to analyze the ownership structure. It is, however, feasible to discuss the ownership structure based on information of a general nature collected from various sources. Industry in Sierra Leone is divided into public-sector, private-sector, or combined-sector ownership.

1. Public-sector ownership of industry

There is no unified pattern of public-sector ownership nor is there any centralized agency or department of Government to oversee and supervise the functioning of public-sector industrial establishments. Public funds are invested in industry by the Ministry of Finance through:

(a) Five statutory bodies:

(i) The Sierra Leone Produce Marketing Board (SLPMB) which was

established to export scheduled agricultural produce such as palm kernels, coffee, cocoa, ginger and so on. Another statutory body, the Rice Corporation has recently been merged with this organization. This Board manages one large palm-kernel oil mill, eight palm-oil mills and three rice mills;

(ii) The Forest Industries Corporation (FIC) operates a timber-processing plant, a furniture factory and a woodcrafts shop;

(iii) The Committee for the management of the National Workshop which was taken over from the defunct railway of Sierra Leone;

(iv) The Road Transport Corporation which runs a large auto repair and service workshop;

(v) The Port Authority which runs another similar repair workshop for the maintenance of its fleet;

(b) Ministries of Government such as the Ministries of Agriculture, Natural Resources, Social Welfare, Information, Public Works, and Transport;

(c) Non-commercial government organizations such as Njala University, the Freetown City Council and the Bank of Sierra Leone;

(d) Companies formed wholly or partly with government funds.

Few industrial projects are established in the public sector without foreign aid or investment. The management of these enterprises is usually vested in the foreign partner. A detailed list of public-sector industrial enterprises has been given in annex III.

Table 5. Ownership structure of industry

Ownership	Establishments		Employees	
	(number)	(percentage)	(number)	(percentage)
1. Public sector:				
(a) Statutory bodies	19	11	2 534	23
(b) Ministries of Government	13	7	1 700	16
(c) Non-commercial organizations of Government	4	2	152	1
(d) Companies registered in Sierra Leone with or without foreign participation	8	4	998	9
Total public sector	44	24	5 384	49
2. Private sector	136	76	5 643	51
Total of both sectors	180	100	11 027	100

This table reflects the distribution of industrial enterprises in the public and private sectors as well as among the four types of ownership mentioned in the public sector.

The table shows that although only 24% of all industrial establishments are in the public sector, these offer employment to 49% of the total industrial labour force. It also shows that the statutory bodies own less than half of the public-sector enterprises. It is clear that the use of (a) and (c) for public-sector ownership of industrial enterprises is hardly appropriate.

2. Corporate Structure

Corporate Structure has a key role to play in broadening the ownership base and ensuring capital formation. Sierra Leone is one of the few developing countries which are making use of corporate ownership in the industrial sector on an appreciable scale. This view was confirmed after inspecting the register of companies in the office of the Registrar General at Freetown. This revealed that since independence as many as 200 industrial companies were formed. Of these, as many as 75 (38% of the companies formed) succeeded in establishing an industrial enterprise. The register also shows that 42% of industrial enterprises are owned by companies and the remaining 58% by partnerships. It appears that the Development Act of 1960, which denies tax concessions to industrial enterprises other than those owned by companies, has promoted the growth of corporate structure. In other words, this form of ownership has been generously used for the purpose of obtaining tax exemption.

A corporate structure of ownership normally accelerates the pace of capital formation and facilitates industrial growth. However, from the facts restated below, this has evidently not happened in Sierra Leone.

(a) Seventy-three per cent of industrial units employ 50 or less workers and corporate structure is not very suitable for this size of enterprise;

(b) Since their incorporation, the expansion of industrial establishments owned by companies has been negligible.

Thus, although corporate structure is a popular form of ownership in Sierra Leone, this has not resulted in capital formation at a faster pace.

The other purpose of corporate structure is the broadening of the ownership base of industrial enterprises. This has also not taken place. This could be due to the absence of a stock exchange, the unattractive profit levels of industrial enterprises owned by companies or to the absence of entrepreneurs in whom small investors can repose their trust.

It would be of interest to the Ministry to collect and analyse annually data on the performance of corporate enterprises in the industrial sector with particular reference to investment generation, capital formation and expansion of the ownership base, and to maintain a chronological record of the growth of corporate-structure ownership.

3. Foreign ownership of Sierra Leonean Industry

Sierra Leone has two sizeable foreign mercantile communities with roots in its economic structure. These together own, manage and run most of the industrial enterprises. Both these communities have traditions of family ownership of business and this has resulted in the formation of family-oriented companies. These communities rely on the industrialized world for technology, equipment and supplies, and on their respective countries of origin for managerial staff. The urban population of Sierra Leone provides the market. The proportion of shares held by nationals of Sierra Leone in the companies formed by these foreign communities is not known but is expected to be negligible.

E. Profiles of 34 industrial establishments used as a sample of the universe

The data so far used from the NDP, from the national accounts, and from the Ministry of Labour have given us information on total investment, gross output value and employment in the industrial sector, on the contribution of the industrial sector to the GDP, and on the scope of the modern industrial sector and its distribution between industry groups.

For the purposes of this review, far more detailed information is required on investment, capital formation, capacity utilization, gross output value, import liability and wages and salaries. This information is scarce.

One of the only sources of such information is the data available on the records of the Ministry of Development and the Ministry of Trade and Industry relating to somewhat over 30 factories. This data has been screened and evaluated, analysed and documented to construct individual profiles of 34 industrial establishments.

It is admitted that, despite every effort, it has not been possible to use a uniform format for the construction of these profiles. This is due to the lack of uniformity in the data available. These profiles together form the source document for this study. How far they can be used as a sample to construct an overall profile of Sierra Leonean industry is analysed in the paragraph that follows. The source document itself is not annexed to the report for reasons of space.

1. The validity of using the profiles as a sample

The source document covers 19% of the establishments in the universe identified (see annex 1) and about 40% of the known or estimated employment in this 19% of the total establishments. This apparently makes the use of these 34 profiles as a random sample for this study possible.

The validity is further explored by placing the sample in the frame of the universe as classified by industry group and employment size in table 6 on the next page.

In summary there is nothing that can replace an industrial census which provides a real base for sample studies of specific issues and problems. Here, it was necessary to develop a base from the only sample available. All the information given below is derived from this sample of the performance profiles of 34 industrial establishments.

2. Investment

Investment data on 32 of the 34 units has been tabulated and is given as annex IV.

In most cases, investment is in terms of original costs and the reporting year is 1976/77.

The data reveals that the total investment of these 32 establishments amounts to Le 49.86 millions. The average investment per unit comes to Le 1.56 millions.

Table 6. Relationship of sample to universe
(a unit = an industrial establishment)

Industry group	Employment-size group[a/] A	B	C	D	E	Total units
1. Food, beverages and tobacco						
Number of units in universe	-	3	2	8	45	58
Number of units in sample	-	3	2	3	3	11
Sample-to-universe ratio (%)	-	100	100	38	7	19
2. Repair and service workshops						
Number of units in universe	1	2	3	5	21	32
Number of units in sample	-	-	-	-	1	1
Sample-to-universe ratio (%)	0	0	0	0	5	3
3. Chemicals, petroleum and refinery products						
Number of units in universe	-	-	1	2	13	16
Number of units in sample	-	-	1	2	6	9
Sample-to-universe ratio (%)			100	100	50	56
4. Building material industries						
Number of units in universe	-	1	1	2	11	15
Number of units in sample	-	1	-	-	1	2
Sample-to-universe ratio (%)	-	100	0	0	0	13
5. Paper products, printing and publishing						
Number of units in universe	-	1	1	2	12	16
Number of units in sample	-	1	-	-	-	1
Sample-to-universe ratio (%)	-	100	0	0	0	6
6. Wood, wood products and furniture						
Number of units in universe	1	-	2	2	8	13
Number of units in sample	1	-	1	-	1	3
Sample-to-universe ratio (%)	100	-	50	0	12	23
7. Plastic, rubber and allied products						
Number of units in universe	-	-	-	3	9	12
Number of units in sample	-	-	-	-	2	2
Sample-to-universe ratio (%)	-	-	-	0	23	17
8. Light engineering and metal products						
Number of units in universe	-	-	1	-	4	5
Number of units in sample	-	-	-	-	2	2
Sample-to-universe ratio (%)	-	-	0	-	50	40
9. Textiles and textile products						
Number of units in universe	-	-	-	2	1	3
Number of units in sample	-	-	-	2	-	2
Sample-to-universe ratio (%)	-	-	-	100	0	67
10. Miscellaneous industries						
Number of units in universe	-	-	-	2	6	8
Number of units in sample	-	-	-	-	1	1
Sample-to-universe ratio (%)	-	-	-	0	17	13
Total industrial sector						
Number of units in universe	2	7	11	28	130	178
Number of units in sample	1	5	4	7	17	34
Sample-to-universe ratio (%)	50	72	36	25	13	19

a/ The designations of employment-size groups A-E are those given in section C, paragraph 3 above.

The investment data further shows that one single factory (Sierra Leone Brewery) accounts for 25% of the total investment of the 32 factories. The Brewery, with an investment of Le 12.39 millions, tops the investment table.

Ninety one per cent of the total investment of the 32 factories is accounted for by only 11 factories.

The first impression which the data gives is that a number of the industrial establishments are either overcapitalized or undercapitalized.

Investment-size groups. The investment data also reflects investment per job created. This indicates the nature of the technology used, the complexity of the industrial operations involved, and gives a cursory impression of the investment used to create the infrastructure required for the project. To this situation, establishments in the sample are divided into four groups on the basis of average investment per employee as shown below.

Group	Investment range per employee (leone)
I	20,000 or more
II	10,000 to 19,999
III	3,000 to 9,999
IV	Less than 3,000

Establishments which fall into these four categories are listed below.

(a) Group I has the following six establishments

	Investment per employee (Leone)
1. Petroleum Refining Co. Ltd.	43,457
2. Seaboard West Africa Flour Mills Ltd.	37,066
3. Sierra Leone Brewery Ltd.	31,850
4. Chanrai Chemicals Ltd.	25,316
5. Aureol Tobacco Co. Ltd.	24,750
6. Panguma Saw Mills Ltd.	24,354

The appearance of 2, 4 and 6 in this category looks surprising. The flour mill has a grinding capacity of 50 tons per shift and in all probability the infrastructure component of the investment cost of this factory is high. As regards Chanrai, the new soap plant has a capacity of 10 tons per shift and the high investment cost signifies the choice of capital-intensive technology. The Panguma sawmill has a capacity of 300,000 cubic feet per year. Its investment cost has been revalued on the high side. In general, all the six are based on highly capital-intensive technology.

(b) Group II has five establishments:

		Investment per employee (leone)
1.	Sierra Leone Explosives Ltd.	19,167
2.	National Confectionery Ltd. (NATCO)	18,109
3.	Wellington Distillery	17,872
4.	Sierra Leone Nail Manufacturing Co. Ltd.	12,850
5.	Foam Manufacturing Co. Ltd.	12,628

Establishment 1 assembles cartridges with the help of a single machine. Establishment 4 produces wire nails. In the opinion of the expert, both are examples of an inappropriate use of capital-intensive technology.

(c) Group III includes:

		Investment per employee (leone)
1.	Palm Kernel Oil Mill	9,333
2.	Sierra Leone Oxygen Factory Ltd.	9,447
3.	Sierra Leone Match Industries Ltd.	9,062
4.	Plastic Manufacturing (S.L.) Ltd. (Bata)	5,960
5.	Metal Ware Manufacturing Co. Ltd. (buckets)	4,815
6.	Sierra Leone Clay Bricks Industries Ltd.	4,040
7.	Sierra Leone Knitting Mills Ltd.	3,195
8.	Sierra Leone Enterprises Ltd. (soft drinks)	3,060
9.	Sierra Leone Government Printing Press	3,032

All these indicate the use of appropriate technology which is neither capital intensive nor labour intensive. In respect of 6, it may be mentioned that two investment figures are available. The factory reported an investment of Le 2 millions in 1976/77. The Ministry's file indicates an accumulated investment of Le 9 millions which, if true, makes this an over-capitalized unit;

(d) Group IV covers the remaining 12 units:

		Investment per employee (leone)
1.	Sierra Industrial Vestment Co. Ltd. (SIVCO) (ready-made garments)	2,813

The investment data further shows that one single factory (Sierra Leone Brewery) accounts for 25% of the total investment of the 32 factories. The Brewery, with an investment of Le 12.39 millions, tops the investment table.

Ninety one per cent of the total investment of the 32 factories is accounted for by only 11 factories.

The first impression which the data gives is that a number of the industrial establishments are either overcapitalized or undercapitalized.

Investment-size groups. The investment data also reflects investment per job created. This indicates the nature of the technology used, the complexity of the industrial operations involved, and gives a cursory impression of the investment used to create the infrastructure required for the project. To this examination, establishments in the sample were divided into four groups on the basis of average investment per employee as shown below.

Group	Investment range per employee (Leone)
I	20,000 or more
II	10,000 to 19,999
III	3,000 to 9,999
IV	Less than 3,000

Establishments which fall into these four categories are listed below.

(a) Group I has the following six establishments

	Investment per employee (Leone)
1. Petroleum Refining Co. Ltd.	43,457
2. Standard West Africa Flour Mills Ltd.	37,066
3. Sierra Leone Brewery Ltd.	31,850
4. Chanrai Chemicals Ltd.	25,316
5. Aureol Tobacco Co. Ltd.	24,750
6. Pangama Saw Mills Ltd.	24,354

The clearance of 2, 4 and 6 in this category looks surprising. The flour mill has a grinding capacity of 50 tons per shift and in all probability the infrastructure component of the investment cost of this factory is high. As regards Chanrai, the new soap plant has a capacity of 10 tons per shift and the high investment cost signifies the choice of capital-intensive technology. The Pangama sawmill has a capacity of 300,000 cubic feet per year. Its investment cost has been revalued on the high side. In general, all the six are based on highly capital-intensive technology.

2.	Sierra Leone Paint Manufacturing Ltd.	2,500
3.	Metal Beds and Springs Manufacturing Co.	2,310
4.	Forest Industries Corporation	2,281
5.	CFAO Motors Ltd.	2,222
6.	Sierra Leone Shrimp Export Ltd.	2,183
7.	Washex Soap Co.	2,175
8.	Freetown Cold Storage	1,775
9.	Feed Mill	1,700
10.	Salt Manufacturing (SL) Co. Ltd.	1,583
11.	Oriental Candle Factory	1,111
12.	Marble Tile Co. Ltd.	625

This group includes two types of industries. Those based on labour-intensive technology are 1, 3, 4, 5, 6 and 12. Those based on single or simple industrial operations or those which are commerce-oriented are 2 and 7 to 11. (In respect of 8, it should be mentioned that investment data for this factory was not available. However, the equity figure was available. Since this was in line with the investment of the other beverage plant, the equity figure has been assumed to be equivalent to the investment figure.);

Industrial investment estimate. By distributing the weight of average investment per worker among employment-size groups and industry groups in the following tables, two separate investment estimates for the whole of Sierra Leonean industry have been formed.

Table 7. Investment estimate, distributing the weight of investment per worker among employment-size groups

Employment-size group a/	Sample			Universe		(%)
	Number of employees	Investment (leone)	Investment per worker (leone)	Number of employees	Investment estimate (leone)	
A	858	1 957 510	2 281	1 348	3 074 788	2.54
B	1 928	26 157 000	13 567	2 746	37 254 982	30.77
C	582	12 131 000	20 843	1 626	33 890 718	28.00
D	518	6 073 500	11 725	1 922	22 535 450	18.61
E	494	3 548 287	7 183	3 385	24 314 455	20.08
Total	4 380	49 867 297	-	11 027	121 070 393	100

a/ The definition of employment-size groups is given in section C, paragraph 3 above.

This table shows that investment in employment-size group A is the lowest and in group B is the highest. This appears to be a normal and appropriate position.

Table 8. Investment estimate, distributing the weight of investment per worker among industry groups

Industry group	Sample		Universe			
	Number of employees	Investment (leone)	Investment per worker (leone)	Number of employees	Investment estimate (leone)	(%)
1. Food, beverages and tobacco	1 648	30 108 512	18 269	3 012	55 028 420	50
2. Repair and service workshops	45	300 000	6 667	2 721	18 140 907	16
3. Chemicals, petroleum and refinery products	400	8 493 000	21 232	592	12 569 344	11
4. Building material industries	511	2 010 000	3 933	1 037	4 078 521	4
5. Paper products publishing	435	1 319 000	3 032	1 017	3 083 544	3
6. Wood, wood products and furniture	1 016	5 805 510	5 714	1 462	8 353 868	7
7. Plastic, rubber and allied products	76	652 831	8 589	419	3 598 791	3
8. Light engineering and metal products	103	548 944	5 329	378	2 014 362	2
9. Textiles and textile products	134	399 500	2 981	209	623 029	1
10. Miscellaneous industries	12	230 000	19 166	108	3 449 880	3
Total	4 380	49 867 297		11 027	110 940 666	100

This table brings down the investment estimate from Le 121.07 millions to Le 110.94 millions and this might be taken as the tentative investment figure for the entire Sierra Leonean industry.

The table also shows that investment in the food, beverages and tobacco group is the highest (50%) of all the 10 groups. Investment in group 9 (textiles), 8 (light engineering), 5 (printing), 7 (plastic products) and 10 (miscellaneous) ranges from 1 to 3% only. This further highlights the imbalance of Sierra Leonean industry the correction of which should be the main aim of future industrial planning.

New investments in industry and their sources. No record is maintained of new investments sanctioned or used for industrial development. The promoters of industrial projects approach the Ministry of Trade and Industry for authorization only if tax exemption is required. The National Development Bank has recently emerged as a significant investor of public funds in the equity of public- and private-sector industrial projects. This bank participates in the equity of new projects and offers loans to fill the financing gap if any.

Project aid received from friendly countries and agencies is also important in the case of industrial projects in the public sector. Private enterprise is no longer very active. Investment by private enterprise has slowed down because the import-substitution sector is visibly saturated. Identification of import-substitution industries now requires market studies. Resource-based industries require large-scale investment beyond the capacity of private enterprise. Whether in the public or the private sector, investment without the participation of foreign enterprise is rare.

The only data available shows the year of establishment of some of the industrial units, and names the projects established in and after 1977. Data on investment in the latter case is not available in the Ministry of Trade and Industry as the project-execution authorities are located in other ministries and agencies of Government. The available data has been tabulated in table 9 below. The investment figures available are those in annex IV.

Table 9. New factories established since 1970

Year of establishment	Name of establishment	Investment (millions of leone)
1970	Petroleum Refining Co. Ltd.	5.51
1971	Salt Manufacturing (S.L.) Co. Ltd.	(.10
1973	Chanrai Chemicals Ltd.	2.00
1973	Palm Kernel Oil Mill	2.80
1974	Sierra Leone Explosives Ltd.	0.23
1975	Foam Manufacturing Co. Ltd.	0.37
1976	Sierra Leone Clay Brick Industries Ltd.	2.00
1976	Sierra Fishing Co. Ltd.	1.00
1977	Palm Oil Mills Ltd., Daru	-
Onwards	Palm Oil Mills Ltd., Gambia Matturu	-
	Mabole Fruit Company	-
	Osman Thomas Salt Project	-
	Jute Products Co.	-
	Mobai Palm Oil Mills Ltd.	-

The investment situation in the above table indicates that, on average, one project has been going into production every year during the nineteen-seventies. This further indicates that average annual investment in the establishment of new plants is around Le 2.50 millions. New investment per year includes investments used for:

		Millions of leone
(a)	The expansion or modernization of existing plants	2.14
(b)	The establishment of new plants	2.50
	Total	4.64

Investment is also taking place in projects now being established such as the sugar mill, but investment on such projects will be shown in the figures for the year in which the plant is completed.

The first National Development plan provided an investment target of Le 45 millions to be reached in five years. The average annual target of projected investment on the above basis was Le 9 millions. Subject to further verification, the achievement of this target has been 41.76%.

Need for the maintenance of a record of investment data. Investment data is of crucial significance for industrial planners and policy makers. It is used to determine and project the rate of investment growth, to identify investment trends, to devise measures to control and improve production efficiency and productivity, to assess the import requirements of spares for machinery, and to facilitate the repatriation of foreign capital and profits earned on that capital. It is therefore proposed that the Ministry should maintain an accurate record of industrial investments.

3. Capital

Capital-formation capacity of existing industry. Industrial development is a dynamic process. Under normal conditions, an industrial establishment either grows or degenerates. It is therefore a normal phenomenon for industry to form capital to facilitate its growth. Capital is formed by means of depreciation profits earned on investment annually. It is also formed by making effective use of the capacity to borrow and to increase the equity share capital. The last two sources seem to be rarely used in Sierra Leone. The first two sources are briefly discussed below:

(a) Depreciation is allowed under taxation laws at varying rates based on the expected life of an item of investment. These rates vary from country to country. Normally, the depreciation allowance on land, buildings and civil works is 5%, on plant and machinery 10% and on transport and office equipment 25% annually. Assuming that the average is 7.5% of the original investment, existing industry has the capacity to earn a depreciation allowance of Le 8.32 millions annually (7.5% of Le 110.94 millions);

(b) Profits are partly distributed as dividends and partly retained for reinvestment. The situation relating to the profitability of Sierra Leonean industry is not very clear. Available data indicate that a small percentage of industrial enterprises are still struggling to break even. On the other hand, there are some which are making a phenomenal return on investment. The average return on investment of the entire industry could be around 15%. Assuming that 5% of this is retained for reinvestment, the amount available annually is about Le 5.55 millions.

Thus, total availability per year could be around Le 13.87 millions:

Capital expenses incurred annually by existing industry. There are only 18 establishments which provide information on capital expenses incurred annually to the Ministry of Development on a form issued by that Ministry. Out of 18, 10 to 12 industrial units reported the capital expenses incurred on machinery, equipment, buildings and civil works during two consecutive years.

Treating this as a representative fact of the situation, it is assumed that 66% of the enterprises do make some investment in a year. The data reported for two years is tabulated below. The investment base is that shown in annex IV.

Table 10. Capital expenses incurred by industry
(leone)

Name of establishment	Investment base	Investment made	
		1975/76	1976/77
Petroleum Refining Co. Ltd.	5 519 000	13 400	776 300
Aureol Tobacco Co. Ltd.	7 648 000	464 622	476 800
Pangama Saw Mills Ltd.	3 848 000	194 000	183 000
Seaboard West Africa Flour Mills Ltd.	3 150 000	92 699	129 930
Chanrai Chemicals Ltd.	2 000 000	278 695	754 082
Sierra Leone Clay Brick Industries Ltd.	2 000 000	-	29 817
Sierra Leone Oxygen Factory Ltd.	440 000	67 286	16 000
Foam Manufacturing Co. Ltd.	378 831	853 776	74 955
Sierra Leone Match Industries Ltd.	290 000	-	140 000
Freetown Cold Storage	284 000	50 000	776 300
Sierra Industrial Vestment Co. Ltd. (SIVCO)	211 000	17 209	-
Oriental Cardl Factory	20 000	90 000	-
Total	26 188 831	2 121 687	3 157 184
Percentage	100	8	12

If the situation reflected in the foregoing table is taken as representative of the entire industry, it can be assumed that the rate of capital formed and invested is 10% of the investment base (i.e. Le 11.09 millions as against the assessed capacity of Le 13.87 millions). This is a good performance by any standards for a developing country.

Table 11. Capacity utilization of establishments in the sample

Name of establishment	Unit of capacity	Capacity	Reporting year	Production	Production as percentage of capacity
Sierra Leone Brewery Ltd.	case	1 500 000	1978	1 543 830	103
National Confectionery Ltd. (NATCO)					
(a) Biscuits	ton	1 200	1978	1 313	109
(b) Confectionery	ton	1 800		1 781	99
Sierra Leone Enterprises Ltd. (7-Up)	case	400 000	1976/77	350 000	88
Amreol Tobacco Co. Ltd.	million sticks	1 960	1976/77	1 227	79
Freetown Cold Storage (Coca Cola)	case	900 000	1976/77	685 000	76
Wellington Distillery	case	35 000	1977	24 550	70
Palm Kernel Oil Mill (input material capacity)	ton	40 000	1975	26 500	67
Chemrai Chemicals Ltd.					
(a) Soap	ton	3 600	1976/77	2 030	56
(b) Polythene bags	ton	360	1976/77	123	34
Feed Mill Products Ltd.	ton	4 400	1976/77	2 160	49
Pangama Saw Mills Ltd.	cu ft	300 000	1978	135 502	45
Sierra Leone Rail Manufacturing Co. Ltd.	cwt	24 000	1974	10 200	43
Sierra Leone Oxygen Factory Ltd.					
(a) Oxygen	cu ft	4 755 000	1975/76	1 883 437	40
(b) Acetylene	cu ft	2 500 000	1975/76	683 586	27
(c) Carbon dioxide	lb	400 000	1975/76	224 191	56
Metal Beds and Springs Manufacturing Co.					
(a) Beds	unit	15 000	1974	5 284	35
(b) Springs	unit	30 000		12 181	41
Petroleum Refining Co. Ltd. (input material)	long ton	500 000	1976/77	194 142	39
Seaboard West African Flour Mills Ltd.					
(a) Flour	ton	49 000	1977/78	16 741	46
(b) Feed Mill	ton	15 500		5 357	60
Sierra Leone Match Industries Ltd.	carton	15 000	1976/77	5 132	34
Foam Manufacturing Co. Ltd.	sq m	9 000	1976/77	3 079	34
Sierra Leone Paint Manufacturing Ltd.	gallon	220 000	1976/77	61 848	28
Salt Manufacturing (S.L.) Co. Ltd.	ton	35 000	1979	8 120	23
Sierra Leone Knitting Mills Ltd.					
(a) Knitwear	dozen	100 000	1976/77	21 608	22
(b) Knitted fabrics	lb	250 000	1976/77	22 147	9

Note:

cwt = 112 lbs or 50.8 kilogrammes
cu ft = 0.028 cu m
gallon = 4.55 litres
lb = 454 grammes
long ton = 2,240 lb or 1,016 kilogrammes
ton or short ton = 2,000 lbs or 907 kilogrammes.

4. Capacity utilization

Data on installed capacity and its utilization is available in respect of only 20 industrial establishments. This is presented in table 11.

The data of the sample, when blown up to project the capacity utilization of all the industrial establishments in the universe, yield the results given in the table that follows.

Table 12. Capacity utilization of establishments in the universe

Capacity used (percentage)	Number of units in the sample using capacity	Estimated units in the universe using capacity	
		(number)	(percentage)
90 to 100	2	18	10
70 to 90	4	36	20
50 to 70	2	18	10
30 to 50	9	81	45
30 or below	3	27	15
Total	20	180	100

Industries with over 70% capacity utilization are those producing alcoholic and non-alcoholic beverages, confectionery and biscuits, and cigarettes. Industries with less than 50% capacity utilization include petroleum refining, wheat milling, animal-feed production, oxygen, matches, foam mattresses, paints, salt and knitwear. The projected figures seem to indicate that 60% of industrial establishments in Sierra Leone are operating below 50% capacity. The average capacity utilization of the entire industry is 51%, which is relatively low.

Some of the most obvious factors restricting full utilization of capacity are:

(a) The small size of the domestic market;

(b) Reduction of industry's share of the domestic market by imports of competitive goods;

(c) The absence of a well-designed plan to boost the export of manufactures.

These are discussed briefly in the paragraphs that follow.

The small size of the domestic market. Market limitations are caused by the small population, low purchasing power and the traditional consumption pattern of the society. Industry in Sierra Leone is designed to produce goods for an urban market which is very limited. It is not designed to make any contribution to improving the purchasing power of the rural population. Industry is not located in rural areas nor based on rural produce. The industry already established does not make any impact on the consumption pattern of the society. These constraints make the development of the local market difficult and endeavours made by industry in this direction have not met with much success;

Reduction of industry's share of the available domestic market. Despite the limitations outlined above, the domestic market for locally produced industrial goods does exist. Industry has, however, to share this market with imported products superior in quality. Protection invariably proves inadequate because of the high production costs of local industry. If protective duties are increased, this results in the arrival of imported products from adjoining countries because of the inter-country trading pattern which permits free inflow and outflow of industrial products. The inter-country trading pattern has flourished because of the lack of ability (and perhaps will) to seal the borders. Economic solutions have not yet been found and, in any case, these can prove effective only with the co-operation of all the countries in the region;

The economics of export. Sierra Leonean industry has no option but to export, but industry is unable to exercise this option fully because of economic factors, the inter-country trading pattern and procedural bottlenecks.

The overwhelming dependence of the country's industry on imported inputs on the one hand makes its products uncompetitive in the export markets and, on the other, makes the balance-of-payment effect of exporting doubtful. Imported inputs include:

(a) Investment capital (whose cost is payable in foreign currency);

(b) Supplies (which include basic, auxilliary and packaging materials and spares);

(c) Services (which include technical, managerial, commercial and administrative services);

(d) Expertise.

Unless the domestic value added is improved, competitiveness in the export market cannot be improved.

The inter-country trading pattern offers a more attractive option to industry, i.e. sales on cash terms to the traders of adjoining countries who visit Freetown periodically. This is more attractive than the customs duty rebate.

Procedural difficulties are encountered both at the customs and at the bank counter. These result in delayed shipments and delayed payments. The removal of these constraints and bottlenecks would be possible but it would first be necessary to carry out a specialized study on how to improve capacity utilization and facilitate exports. The constraints and bottlenecks in the domestic and export markets listed above are probably not the only ones. There could be others common to industry in general or specific to individual enterprises. A specialized study is needed not only to uncover all these factors but also to identify the necessary remedial measures.

Such a study is not possible without the co-operation and participation of industry. The industrialists should know the circumstances under which both capacity utilization and exporting are possible. They have made previous efforts in these fields and their knowledge and experience will provide a base for this study.

It is therefore proposed that a joint study group be formed, composed of the representatives of:

Industry (through the Chamber of Commerce)
The National Development Bank
The Research Department of the Bank of Sierra Leone
The Ministry of Trade and Industry

The terms of reference of the proposed study will be drawn up when required.

5. Gross output value

Annual gross output value is known for only 29 establishments in the sample. This data has been tabulated in annex V.

A comparison of this with the investment data (annex IV) shows that two enterprises have been included which do not appear in the investment data, namely A.J. Seward, and Cosmetics Pharmaceutical Ltd. Also that five enterprises have been left out because their output value is not known. These are Sierra Leone Clay Brick Industries Ltd., Sierra Leone Explosives Ltd., Sierra Leone Shrimp Export Co. Ltd., Marble Tile Co. Ltd. and Metal Ware Manufacturing Ltd. Thus, whereas the investment sample covers 19% of the total industrial establishments, the output value sample covers only 16% of these units. Both investment and output data are available for 27 industrial establishments, representing 15% of the units in the universe. This is a situation which could not be helped due to the absence of data.

Aggregates and averages of gross output value. The data on gross output value shows the following aggregates and averages.

		Leone
(a)	Gross output value of 29 establishments	95,720,796
(b)	Number of employees 3,839	
(c)	Average gross output value per employee	4,934
(d)	Gross output value per investment of Le 1,000	2,021

The figure at (d) above has been computed on the basis of the investment of Le 47.35 million in 29 establishments of this sample;

Estimate of the gross output value of Sierra Leonean industry. This is calculated by distributing the weight of the averages at (c) and (d) in the foregoing paragraph among employment-size and industry groups. Table 13 gives an estimate based on the average per employee as distributed among employment-size groups.

Table 13. Estimate of gross output value, based on the average output per employee in each employment-size group

Employment-group size a/	Sample			Universe		
	Number of employees	Total output value (leone)	Average output value per employee (leone)	Number of employees	Estimated total output value (leone)	(percentage)
A	858	1 560 839	1 819	1 348	2 452 012	0.93
B	1 433	37 163 305	25 933	2 746	64 220 008	24.39
C	582	36 993 111	63 321	1 626	102 959 946	39.10
D	518	14 969 654	28 956	1 922	55 653 432	21.14
E	448	5 033 885	11 236	3 385	38 033 860	14.44
Total	3 839	95 720 796		11 027	263 319 258	100

a/ The employment-size groups A-E are those described in section C, paragraph 3 of this chapter.

Another estimate of gross output value is obtained by distributing the weight of both the averages (per employee and per investment unit of Le 1,000) among industry groups. In the table that follows, since output per employee of groups 4 and 10 was not available. The average of employment-size group E above has been used. The figures given for estimated investment in column 5 are taken from table 8.

The estimates of gross output value based on output per employee (column 6) and on output per investment unit of Le 1,000 (column 7) are so close that the gross output value of the entire industry can be assumed to be around 186.92 million leone.

Table 14. Estimate of gross output value, distributing the weight of averages among industry groups

Industry group	Sample			Universe					
	Number of employees	Average output value per:		Number of employees	Estimated investment ('000 Le)	Estimated output value based on:			
		Employee (leone)	Investment unit of Le 1,000 (leone)			Employees cols (2) x (4)		Investment cols (3) x (5)	
						('000 Le)	(%)	('000 Le)	(%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Food, beverages and tobacco	1 611	34 187	1 834	3 012	55 028	102 971	54	100 921	54
2. Repair and service workshops	45	3 702	555	2 721	18 141	10 073	5	10 068	5
3. Chemicals and refinery products	459	76 706	4 101	592	12 569	45 410	24	51 546	28
4. Building material industries	...	11 236	1 312	1 037	4 079	11 652	6	5 352	3
5. Paper products, printing and publishing	435	3 144	1 037	1 017	3 084	3 197	2	3 198	2
6. Wood, wood products and furniture	1 016	2 071	362	1 468	8 354	3 027	2	3 024	1
7. Plastic, rubber and allied products	76	7 860	966	419	3 599	3 293	2	3 477	2
8. Light engineering and metal products	63	11 387	2 015	378	2 014	4 304	2	4 058	2
9. Textiles and textile products	134	3 581	1 202	509	623	748	3	749	3
10. Miscellaneous industries	...	11 236	1 312	180	3 450	2 022		4 526	
Total	3 839			11 333	110 951	186 697	100	186 919	100

6. Industrial inputs and their cost in foreign currency

The main industrial inputs in Sierra Leone are as follows.

(a) Materials (basic, auxilliary and packaging) and spares. Materials consumed by Sierra Leonean industry include semi-processed materials, intermediates and even prepared products imported for packing. It has been estimated (see annex VI) that 96% of all materials used by Sierra Leonean industry are imported. The domestic contribution is only 4%. Materials form 58% of the total input of industry;

(b) Personnel costs include salaries, wages and cost of fringe benefits allowed to employees both local and expatriate. It is roughly estimated that about 20% of the salary and wage bill of the entire industry could leave the country in foreign currency. The remaining 80% forms around 7% of the total input;

(c) The cost of utilities includes power, steam and water. No estimate of the foreign currency component of the cost of utilities is possible, but it could be as high as 60%;

(d) The cost of maintenance of plant, buildings, and other fixed assets includes that of transport and office equipment. No data is available on these inputs and consequently the foreign currency component of this factor cannot be estimated;

(e) The cost of depreciation can be distributed between local and foreign currency if the investment made in each currency is known. Depreciation is allowed at a higher rate on imported equipment and therefore it is assumed that around 75% of the depreciation allowed is usable for replacement of imported equipment or additions to the installed equipment. Only 25% is expendable on the replacement or extension of buildings and civil works;

(f) Capital charges other than depreciation. Interest on borrowed capital is payable in the currency of that capital. Most new projects are repatriating interest in foreign currency on foreign capital used for financing;

(g) The cost of know-how is repatriable in the form of a royalty or licence fee on sales and is entirely in foreign currency;

(h) Management fees are mostly repatriable, only a small proportion is used locally. In any case, the ratio of local to foreign currency varies from enterprise to enterprise based on agreements;

(i) The cost of insurance on supplies from abroad is payable in foreign currency;

(j) The cost of administration including sales expenses, travels costs, communication costs (telephone, telex and postage), costs of stationery, office supplies and other sundary expenses, is partly payable in local and partly in foreign currency.

Ex-factory prices include profit on investment which can be distributed between local and foreign currency on the basis of the composition of the investment. Value added by industry may be reasonable and even considerable but the domestic value added is marginal and this is the major problem of local industry.

It is for the Ministry to take stock of the situation and to develop measures to improve industry's domestic value added. It is possible to improve the domestic value added by replacing imported inputs with local ones and in several cases the prospects are promising. All future development plans for industry are to be aimed at turning the corner. This forms a subject of discussion in a separate chapter of this report.

Of the inputs into Sierra Leonean industry listed above, data is only available on raw materials and on personnel costs. However, these are the two major inputs. They are analyzed and discussed in the following paragraphs.

Data on raw-material imports. The information tabulated in annex VI is based on the data reported by 27 industrial units either to the Ministry of Development or to the Ministry of Trade and Industry. Of the 27 units, the reporting year is either 1976/77 or 1977 for 17 of the units, 1978 for six units and 1974 for four units.

Some prominent features of the situation revealed by this data are presented below.

Imported materials as a percentage of total materials used by industry	96%
CIF, Freetown, value of the imported materials used by the 27 establishments in one year	Le 51.96 million
Gross output value of the 27 units in one year of operation	Le 88.05 million
Average imports per output-value unit of Le 1,000	Le 590
Investment cost of 24 out of the 27 establishments	Le 43.08 million
Average annual imports per investment unit of Le 1,000	Le 1,201
Number of persons employed in the 27 establishments	3,494
Average CIF value of materials used per employee	Le 14,878
Average CIF value of imports per establishment	Le 1.92 million

Estimate of annual raw-material imports by the entire industry. Primary estimates, based on the averages given in the last paragraph, are as follows:

	Millions of leone
Estimate based on average material used per employee	164.05
Estimate based on average imports per investment unit of Le 1,000	118.11
Estimate based on average imports per output-value unit of Le 1,000	114.37

If the weight of the average of the last item is distributed among the 10 industry groups, a more realistic estimate of the imports of industrial materials per year can be developed.

Table 15. Estimate of total industrial imports of raw materials per year, distributing the weight of average imports per output-value unit of Le 1,000 among industry groups

Industry groups	Sample		Universe		
	CIF value of imports (leone)	Imports per output-value unit of Le 1,000 (leone)	Estimated output value (1 000 Le)	Estimated imports (1 000 Le)	(%)
1. Food, beverages and tobacco	18 992 676	397	100 921	40 065	38
2. Repair and service workshops	...[a]	90[a]	10 068	5 920	5
3. Chemicals, petroleum and refinery products	30 020 263	883	51 546	45 515	43
4. Building material industries	...[a]	590[a]	5 352	3 147	3
5. Paper products, printing and publishing	1 324 000	967	3 198	3 092	3
6. Wood, wood products and furniture	623 384	296	3 024	895	1
7. Plastic, rubber and allied products	257 053	430	3 477	1 495	1
8. Light engineering and metal products	577 723	805	4 058	3 266	3
9. Textile products	192 039	402	479	192	-
10. Miscellaneous industries	...[a]	90[a]	4 526	2 661	3
Total	51 987 138		186 919	106 248	100
Average		590			

[a] Since the imports of groups 2, 4 and 10 were not known, averages of the whole industrial sector have been used as estimates.

This table shows that the import liability of industry groups 6, 1, 9 and 7 is low compared with that of groups 5, 3 and 8. The total import liability of Sierra Leonean industry is estimated at around Le 106 million.

Enterprises using imported materials beyond 50% of their gross output value. These are as follows:

Enterprise	Value of imported materials as a percentage of gross output value
Sierra Leone Government Printing Press	97
Petroleum Refining Co. Ltd.	90
Metal Beds and Springs Manufacturing Co.	82
Sierra Leone Nail Manufacturing Co. Ltd.	78
Seaboard West Africa Flour Mills Ltd.	66
Washex Soap Co. (laundry soap)	66
Freetown Cold Storage (beverages)	59
Chanrai Chemicals Ltd. (laundry soap)	59
Sierra Leone Knitting Mills Ltd.	57
Feed Mill Products Ltd.	56
Sierra Leone Enterprises Ltd. (beverages)	56
Foam Manufacturing Co. Ltd.	53
National Confectionary Ltd. (NATCO)	52
A.J. Seward	51
Sierra Leone Paint Manufacturing	50

This represents only the import liability for materials. If the liability in foreign currency for other items mentioned in paragraph 6 is taken into account, it could be that the annual foreign currency liability of at least the first four enterprises in the foregoing list might exceed their gross output value. It is also possible that the net balance-of-payment effect of certain enterprises is negative. If should be possible to improve the domestic value added and to curtail imports or the dependence on imports of several enterprises.

Enterprises using imported materials to a value less than 30% of their gross output value. Sierra Leone has industries whose domestic value added is higher and whose balance-of-payment effect is positive beyond any shadow of doubt. The sample in annex VII shows 12 out of 27 enterprises whose import liability is less than 50%. This means that 45% of the enterprises have a sound base. Of these, five enterprises have an import liability lower than 30% of their gross output value. These are mentioned below:

	Value of imported materials as a percentage of gross output value
Sierra Leone Oxygen Factory Ltd.	7
Forest Industries Corporation	21
Sierra Industrial Vestment Co. Ltd. (SIVCO)	21
Aureol Tobacco Co. Ltd.	29
Sierra Leone Brewery Ltd.	26

This highlights the need for evaluating industrial projects prior to authorizing their establishment. Enterprises with negative or marginal balance-of-payment effect or domestic value added cannot be expected to contribute much to the economy.

Cost of imported materials for maintaining one person in employment. Employment is one objective of industrialization. In paragraph 2 above, the investment cost per job created by existing industry is discussed. The average per job is very high, i.e. Le 11,385. This indicates an indiscriminate use of capital-intensive technology.

Sierra Leone likewise incurs a foreign-exchange liability for maintaining each person in employment. A part of this liability is incurred in the form of materials imported. The average per employee of the 27 factories in the sample is as high as Le 14,878, which reflects their over-heavy import base. The cost of imported materials per employee of the following 10 enterprises exceeds Le 10,000 per year.

Enterprises	Cost of imported materials per employee (Leone)
Petroleum Refining Co. Ltd	212 863
Seaboard West Africa Flour Mills Ltd.	72 041
Feed Mill Products Ltd.	22 536
Washex Soap Co.	18 343
National Confectionery Ltd. (NATCO)	16 090
Chanrai Chemicals Ltd.	14 333
Oriental Candle Factory	13 333
Sierra Leone Nails Manufacturing Co. Ltd.	12 935
Aureol Tobacco Co. Ltd.	12 218
Sierra Leone Brewery Ltd.	10 343

These 10 enterprises form 37% of the 27 units in the sample. To these may be compared the import liability of the following 12 establishments at the lower end of the scale of cost per employee.

Forest Industries Corporation	440
Sierra Leone Oxygen Factory Ltd.	554
Sierra Industrial Vestment Co. Ltd. (SIVCO)	613
Pangum Saw Mills Ltd.	1 558
Cosmetic Pharmaceutical Co. Ltd.	1 833
Sierra Leone Knitting Mills Ltd	2 475
Sierra Leone Match Industries Ltd.	2 563
Salt Manufacturing (S.L.) Co. Ltd.	2 903
Plastic Manufacturing (S.L.) Ltd.	3 018
Sierra Leone Government Printing Press	3 044
Foam Manufacturing Co. Ltd.	3 940
Sierra Leone Enterprises Ltd.	4 043

If employment is the prime objective of industrialization, its achievement requires the evaluation of an industrial project to determine its initial and recurring foreign-currency liability per job created prior to authorizing its establishment.

7. Imports and import policy

Imports in Sierra Leone are licensed but not regulated to achieve rationalization. The use of import licensing as a tool of industrial development is not practised.

Import procedures are simple. Items are categorized either as Open General Licence (OGL) or specific. OGL is regulated by the Bank of Sierra Leone on the basis of the changing balance-of-payment situation. The OGL list includes certain items of industrial consumption. There is no distinction between items required for industrial use and those for commercial sale. The Ministry of Trade and Industry controls the specific list. This list covers several items of industrial use. Applicants for licences are required to provide documentary evidence to justify the import. The Bank of Sierra Leone exercises its control by limiting the import of items on this list up to the overall ceiling fixed. Liberal imports during the initial phase of development reduce the incentive for import substitution by local industry and simultaneously restrict full utilization of installed industrial capacity. This practice permits industry to use imported raw and intermediate materials in place of those available locally. For instance, laundry soap is produced from imported oil.

However, the import policy, as practised, does enable the Government to keep price levels under control and requires industry to achieve the standard of operational efficiency necessary for survival in the face of competition with imported products.

Import licences issued by the Ministry. On request, the Ministry of Trade and Industry has provided a list of 24 industrial establishments to whom licences for imports to the value shown against their names were issued in 1977 and 1978. This list is given in annex VII. This list shows that the value of the licences issued in 1977 was Le 30.41 million and of those issued in 1978 was Le 19.66 million. This variation in the value of licences issued between the two years indicates that import licences are not issued to industry on the basis of industrial capacity.

Comparison of import-licence value with the CIF value of imported materials reported by industry. The data provided by the Ministry (annex VII) does not

tally with the data provided by the industrial enterprises themselves to the Ministry (annex VI). In some cases, the value of import licences issued even exceeds the gross output value shown in annex V. Out of 24 establishments, there are only 11 which appear in all the three annexes mentioned. It therefore seems appropriate to provide a comparison to measure over- or under-licensing in percentages. Annex VII gives the value of licences issued during the years 1977 and 1978. For the purpose of comparison, the average of the two years is used.

Table 16. Comparison of the value of import licences issued annually with the CIF value of the materials imported and the value of goods produced

Establishment	Value of import licences issued (average of 2 years) (leone)	CIF value of materials imported per year (leone)	As a percentage of the licence value	Gross output value (leone)	As a percentage of the licence value
National Confectionery Ltd. (NATCO)	7 503 500	2 204 265	29.40	4 217 655	56.20
Oriental Candle Factory	475 000	240 000	50.52	120 000	25.26
Feed Mill Products Ltd.	102 500	473 260	461.71	846 433	625.78
Sierra Industrial Vestment Co. Ltd. (SIVCO)	90 000	46 000	51.11	222 536	247.26
Washex Soap Co.	175 000	1 045 575	597.47	1 579 020	902.29
Metal Beds and Springs Manufacturing Co.	100 000	309 023	309.02	374 330	374.33
P.Z. (Sierra Leone) Ltd.	8 513 750	82 000	9.63	194.629	2.28
Sierra Leone Nail Manufacturing Co. Ltd.	1 588 544	268 700	16.91	343 000	21.59
Salt Manufacturing (SL) Co Ltd.	382 500	188 700	49.33	624 000	163.13
Aureol Tobacco Co. Ltd.	2 500 000	3 775 222	151.00	13 054 680	540.18
Sierra Leone Brewery Ltd.	569 640	4 023 508	706.32	15 413 659	270.85

The above table includes National Confectionery Ltd. (NATCO) which has a sister commercial enterprise, Choithram. It is assumed that the licence issued covers Choithram. Similarly, P.Z. (Sierra Leone) Ltd. is a commercial enterprise, a subsidiary of which runs a match factory. It is assumed that the licence covers the requirements of both. The over-licensing in the case of another four enterprises, i.e., Oriental Candle Factory, SIVCO, Sierra Leone Nail Manufacturing Co. Ltd. and Salt Manufacturing (SL) Co. Ltd. could be due to oversight or for some valid reason not known. The remaining five enterprises are under-licensed. To streamline imports, it is proposed that a system of industrial licencing should be devised and introduced. This system has to be designed to fulfil the needs of import rationalization, capacity utilization, industrial development and export promotion. A discussion on this system will be found in one of the following chapters of this report.

8. Wages and salaries

Employees in industry are classified into:

(a) Managerial, administrative and supervisory personnel;
(b) Skilled, semi-skilled and unskilled workers.

The employees in category (a) are by and large expatriates and foreigners. Expatriates include many Indians and Lebanese born in Sierra Leone. It is not easy to distinguish those newly arrived from those who have lived in Sierra Leone for a long time.

Data is available for 28 enterprises, but separate information in respect of (a) and (b) above is available for only 14 enterprises. Annex VIII (A), provides data on these 14 units, while annex VIII (B) presents data on those enterprises for which separate information in respect of managerial and other employees is not known. The table at annex VIII (A) reflects the weight of the supervisory staff in personnel costs and that of the latter in the gross output value of each individual enterprise.

The emoluments of supervisory staff form 34% of the total personnel costs. The bulk of the supervisory staff is composed of expatriates. It is obvious that the employment of expatriates is costly and yet the industry has not done anything to ensure their replacement by Sierra Leoneans. As a consequence, Sierra Leoneans have been deprived of jobs, experience and training. Employment of more costly expatriates also affects the prices of local industrial products and operational costs in foreign currency. It is therefore necessary for the government to ensure on-the-job training for Sierra Leoneans and the gradual replacement of expatriate personnel by local staff.

The annex also provides an indicator of the value added by each individual enterprise. Value added by an industrial enterprise in Sierra Leone is composed of only two items, personnel costs and gross profits. No data about the latter is available. However, from the data available about the former, the situation can be gauged. It may be said that the gross value added also includes depreciation and interest on borrowed capital. In this case also, no adequate data is available.

In table 17, the personnel costs in overall terms form about 8% of the gross output value. This figure will be confirmed by distributing the weight of average emoluments per worker among industry groups, as has been done in table 18.

Table 17. Employment, personnel cost per employee and as a percentage of output value

	Number of employees	Emoluments (1 000 Le)	Personnel cost per employee (leone)	Output (1 000 Le)	Personnel cost as percentage of output
Sample	3 445	4 709	1 367	87 143	5.4
Universe	11 027	15 160	1 367	186 919	8.1

Based on the assumption made earlier in this chapter that the average return on investment is around 15% (section E, paragraph 3, the gross profit as a percentage of gross output is about 9%. This 9% together with the 8% of personnel costs results in an estimated average net value added of 17% for the entire industry. The reporting year in most cases is 1976/77.

Domestic value added is different because this excludes the added value in foreign currency such as depreciation of imported assets and services. Reverting to the personnel costs, the enterprises included in the sample with personnel costs lower than or about the average mentioned are as follows:

	Personnel costs as a percentage of gross output value
Seaboard West Africa Flour Mills Ltd.	1.33
Petroleum Refining Co. Ltd.	1.37
Chanrai Chemicals Ltd. (soap)	2.07
Washex Soap Co.	2.66
Feed Mill Products Ltd.	2.87
S.L. Paint Manufacturing Ltd.	3.68
National Confectionery Ltd. (NATCO)	4.26
Sierra Leone Nail Manufacturing Co. Ltd.	5.53
Sierra Leone Brewery Ltd.	5.63
Aureol Tobacco Co. Ltd.	5.76
Oriental Candle Factory	5.83
Cosmetic Pharmaceutical Co. Ltd.	6.16

It is evident that the value added in the first six enterprises will be marginal. There are, however, industrial enterprises in Sierra Leone with higher personnel costs and value added. Those in the sample are as follows:

	Personnel costs as a percentage of gross output value
1. Sierra Leone Oxygen Factory Ltd.	54.24
2. CFAO Motors Ltd.	53.61
3. Sierra Industrial Vestment Co. Ltd. (SIVCO)	40.90
4. Sierra Leone Government Printing Press	40.60
5. Pangama Saw Mills Ltd.	27.62
6. Forest Industries Corporation	25.89
7. A.J. Seward	21.98
8. Sierra Leone Knitting Mills Ltd.	19.84
9. Plastic Manufacturing (S.L.) Ltd. (Bata)	17.86
10. Foam Manufacturing Co. Ltd.	14.42
11. Sierra Leone Match Industries Ltd.	13.53
12. Freetown Cold Storage Ltd.	11.30
13. Wellington Distillery	8.96
14. Salt Manufacturing (S.L.) Co. Ltd.	8.17

Table 18. Employment, personnel cost per employee and as a percentage of output value by industry group

Industry group	Number of employees	Emoluments (1000 Le)	Personnel cost per employee (leone)	Number of employees	Emoluments (1000 Le)	Output (1000 Le)	Personnel cost as percentage of output
1. Food, beverages and tobacco	1 236	2 345	1 897	3 012	5 714	100 192	5.7
2. Repair and service workshops	...a/	...a/	1 112	2 721	3 026	10 026	30.0
3. Chemical, petroleum, and refinery products	478	966	2 021	592	1 196	51 546	2.3
4. Building material industries	...a/	...a/	1 112	1 037	1 153	5 352	21.5
5. Paper products, printing and publishing	435	556	1 278	1 017	1 300	3 198	40.6
6. Wood, wood products and furniture	1 016	554	0 545	1 462	797	3 024	26.3
7. Plastic, rubber and allied products	76	99	1 303	419	546	3 477	15.7
8. Light engineering and metal products	65	47	0 723	378	273	4 058	6.7
9. Textiles and textile products	139	142	1 022	209	214	749	28.6
10. Miscellaneous industries	...a/	...a/	1 112	108	140	4 526	2.6
Total	3 445	4 709	-	11 027	14 339	186 919	7.7

a/ Due to lack of data, the average personnel cost per employee of employment group E has been used for groups 2, 4 and 10.

As already mentioned, the situation presented above requires two-fold action:

(a) Formulation of a policy to ensure the gradual replacement of expatriates by local employees;

(b) Formulation of guidelines to ensure improvement in the value added of certain industries.

These issues are discussed in the following chapters.

III. CHARACTERISTICS AND PROBLEMS OF SIERRA LEONEAN INDUSTRY

A. Control and direction of industry

Industry in Sierra Leone has emerged in the absence of local capital, local entrepreneurship and local managerial and technical personnel. Initiative and direction in the field of industrial development, therefore, came from foreign investors and the expatriate communities settled in Sierra Leone. After almost two decades of independence, the situation has not changed. Initiative, control and direction continue to remain in the hands of outsiders.

1. Entrepreneurship development

The development of national entrepreneurship would be promoted by the establishment of an institution which could assist in the selection, formulation, evaluation, financing, implementation and subsequent management of industrial projects. Such an institution has so far not been thought of and the prospect of its establishment is remote. The absence of such an institution has helped outsiders to retain the initiative, control and direction of industry.

2. Government participation

The lack of national entrepreneurship as well as the absence of any institution to promote it, makes it imperative for the Government, through the Ministry of Trade and Industry, to participate actively in the process of industrial planning and development. A Development Act has been in existence since 1960 which authorizes the Ministry to award development certificates to such companies as may require tax concessions for investing in industry. The Act does not impose any restriction on the choice of industry, its size or location. Thus, despite the existence of this law, the role of the Ministry of Trade and Industry in the field of industrial development has remained limited. The Development Act of 1960 is now being replaced by a new Development of Industries Act. This law, when enacted, will equip the Ministry with powers to take over the initiative, direction and control of industry. However, unless the Ministry acquires the capacity to operate the proposed law and to participate actively in the planning and development process of industry, the situation will not change. To create this capacity, a scheme for establishing a Division of Industrial Development Programming, composed of three sections, one each for industrial planning, industrial operation and small industries, has been finalized. It is anticipated that, with the implementation of this scheme, the problem of training local personnal might be solved.

This project plans to equip the staff in the industrial planning section with the skills required for undertaking industrial studies, formulating and evaluating industrial projects and preparing annual development programmes. It is hoped, through this, to pave the way for the Ministry to take over the direction of industry in Sierra Leone.

B. Characteristics of Sierra Leonean industry

The industrial data presented in the foregoing chapter and its analysis, shows that Sierra Leone has developed an industry with certain characteristics which give rise to problems.

(a) Industry is market-oriented and commodity-based;

(b) Industrial enterprises have a family-oriented ownership base;

(c) The industrial base lacks balance and equilibrium;

(d) Some industries are based on an excessive use of capital-intensive technology;

(e) Installed industrial capacity is under-utilized;

(f) Industry tends to function on high production costs;

(g) Exports are underdeveloped;

(h) Imports are overdeveloped.

Each characteristic is briefly reviewed in the paragraphs that follow to identify specific problems and their solutions.

The main objective, however, remains to determine how far the existing industrial base can be used as a springboard for further development.

1. Market-oriented commodity base

Private enterprises, whether foreign or local, mostly produce consumer goods to meet the demand in urban areas. This is substantiated by the list of commodities produced in each of the 10 industry groups.

1. Food, beverages and tobacco

Wheat flour, bakery products, husked rice; palm and palm-kernel oil; Beminix baby food; solar salt. Coca Cola, 7-Up, Canada Dry and other synthetic soft drinks; pineapple, citrus and mango juice; Star, Heineken and Guiness beer; whisky, dry gin and wines; biscuits, confectionery; poultry feed, poultry products; frozen fish, shrimps and lobsters; cigarettes (several well-known brands).

2. Repair and service workshops for

   Automobiles, agricultural equipment, construction machinery, equipment used in banks and offices, air-conditioning equipment.

3. Chemicals, petroleum and refinery products

   Refinery products (motor spirit, kerosene oil, naphta, bunker oil etc.); industrial gasses (oxygen, nitrogen, acetylene and carbon dioxide); paints; toilet soap, laundry soap; safety matches; candles. This sector also packs imported cosmetics, aromatics and insecticides.

4. Building material industries

   Terrazzo tiles, marble tiles, clay bricks, cement blocks, pre-stressed and pre-cast building elements, metal doors and windows.

5. Paper products, printing and publishing

   Cartons for packing, toilet paper in consumer-size rolls, stationery, printed educational material.

6. Wood, wood products and furniture

   Sawn and seasoned timber, furniture, boats.

7. Plastic, rubber and allied products

   PVC sponge beach sandals, PVC shoes, suitcases, polythene bags, foam mattresses, and plastic bottles.

8. Light engineering and metal products

   Nails, springs, trunks, buckets and some farm tools.

9. Textiles and textile products

   Knitted fabrics, knitwear, ready-made garments.

10. Miscellaneous industries

    Bedspring mattresses, cut and polished diamonds, cut and polished mirrors, cartridges.

As can be seen, 90% of the commodities produced are consumer goods for sale in urban areas. Sierra Leone not only produces a large variety of consumer goods but has become self-sufficient in most of these items. This is a remarkable achievement.

However, Sierra Leone offers a very small market for consumer goods. The population is around 3 million and the per-capita income about $US 130. The choice of commodities suitable for consumption in urban areas alone has further restricted the market. It is the market limitation which has guided the planning and growth of industry in Sierra Leone. Consequently 73% of the industrial enterprises established are too small in size. A glance at annex I and the foregoing chapter shows that there are:

(a) Industries in which there is only one factory for the industry;

(b) Small enterprises which hold a monopoly of the items they produce;

(c) Enterprises enjoying a monopoly which are unable to run their respective industrial plants to full capacity.

This is a situation which can be remedied by pursuing a course of product and market diversification with minimum additional investment. Such a course would require conscious planning by each enterprise concerned. The Ministry of Trade and Industry can offer consultancy and advisory services in the selection of new products and new markets as well as indicating the additional facilities required to achieve the diversification course chosen. It is in this field that the Ministry could use the expertise available in this project after specific enterprises have been selected.

2. Family-oriented ownership base

This characteristic of Sierra Leonean industry has been discussed fully in chapter II, section D above. This discussion establishes the need to broaden the ownership base so that existing industry can grow and expand and the benefits of industry be more widely distributed.

Proposals for measures to facilitate broadening the ownership base of industry were contained in the draft of the Development of Industries Act. They included the establishment of a stock exchange and the establishment of an investment trust. The first of these proposals found favour and the establishment of a stock exchange is now expected to become a statutory responsibility of the Ministry of Trade and Industry. However, the stock exchange when established will only be a means towards the achievement of the end. The success of the stock exchange will depend on the emergence of entrepreneurs in whom small investors can repose trust, and this in turn depends on the dividends declared and the capital gains assured. To achieve these ends, a close supervision of the

functioning of corporate structures by the Bank of Sierra Leone is necessary. The Bank is in a position to promote and control capital formation in the corporate structures. It is further proposed that the capital-formation data of corporate structures should be released annually for use by planners.

The proposal for an investment trust did not find favour because the National Development Bank had already been authorized to participate in the equity of industrial projects. It was also discovered that the Bank of Sierra Leone has a savings bonds scheme the proceeds of which form a development fund at present used for agricultural development. As the National Development Bank is short of resources and cannot pursue its programme of equity participation vigorously, it is proposed that the development fund maintained by the Bank of Sierra Leone should be used partly to finance the equity participation programme of the National Development Bank.

3. Imbalance of the industrial base

An industrial base operates as a springboard for growth and development only if it is balanced. The equilibrium required for this purpose is lost by laying emphasis on certain subsectors and neglecting others. An imbalance is also caused if raw-material producing areas are deprived of related industries and too much emphasis is put on the development of consumer-goods industries in the main market centre of a country.

In Sierra Leone, the emphasis has been on the creation of import-substitution industries to the neglect of export development. In this narrow field of import substitution, care has not been exercised to develop a balanced complex based partly on local and partly on imported materials. Almost everything produced by Sierra Leonean industry is based entirely on imported materials. Thus equilibrium is lacking even in this narrow field. The strength of an industrial structure is gauged by the extent to which engineering and resource-based industries are developed. In Sierra Leone these have been neglected. Industry has been allowed to concentrate in Freetown where an industrial estate has been established and is now fully occupied.

The correction of the existing imbalance is discussed in the paragraphs that follow under the headings:

(a) Import-substitution industries;
(b) Engineering industries;
(c) Resource-based industries;
(d) Concentration of industries in Freetown.

Import-substitution industries. It is necessary for Sierra Leone to freeze the growth of manufacturing industries which rely mostly on imported raw and intermediate materials for some years to come. It is foreseen that this objective will be achieved after the Development of Industries law is enacted and enforced. The proposed law does not permit the authorization of industrial projects whose value added is less than 30% and whose balance-of-payment effect is not definitely positive. It is also necessary for Sierra Leone to control and reduce the existing import liability of industry. The Development of Industries law, if enacted, will authorize the Ministry to introduce and establish a system of industrial licensing. It is proposed that the procedures to control and reduce the import liability may authorize the Ministry to:

(a) Shift all items of industrial materials and spares from the Open General Licence List to the specific list of items whose import is permitted in Sierra Leone (the Ministry of Trade and Industry controls only those imports which are on the specific list);

(b) Refuse the issue of import licences for those items, for which local substitutes are available;

(c) Direct an industrial enterprise to introduce production of certain of their requirements locally within a specified period, after which the import of that item could be restricted.

An instance of (b) is the import of fatty acids for laundry soap. This import could be replaced by palm oil. An instance of (c) is wooden match sticks which are being imported but can be produced locally;

Engineering and metal industries. The engineering subsector of industry includes both heavy- and light-engineering as well as metal industries of all sorts. It is proposed that, in the forthcoming national plan for the industrial sector, a prominent place should be assigned to engineering and metal industries. To initiate development in this field, it is further proposed that;

(a) The existing programme of skill development should be reviewed, redesigned and expanded (in this connection, it may be said that the Ministry of Education at present manages and runs three trade centres with the assistance of the International Labour Organization (ILO) to provide training in basic engineering and electrical skills. It seems necessary to relate the training more closely to the needs of industry;

(b) A comprehensive scheme for the reorganization of the National Workshop should be prepared, approved and financed on a priority basis (a further discussion on this workshop appears later in the report);

(c) The repair and service workshops subsector should develop a capacity for the production of spares, components and accessories as well as for undertaking sub-assembly or assembly of certain items (these are identified in a subsequent chapter);

(d) New projects in this field should be identified and included in the next development plan (this is one of the tasks of this project);

Resource-based industries. The foregoing chapter adequately demonstrates the imbalance caused by the neglect of the resource-based industrial subsector in the past. The proposed Development of Industries Act attaches top priority to this subsector. These measures are not likely to prove effective or adequate unless there is simultaneous planning and financing of:

(a) Development of the infrastructure in raw-material producing areas;

(b) Development in the related primary sectors of the economy to ensure a continuing supply of materials;

(c) The creation of industrial processing and manufacturing facilities.

It is evident that planning the growth of resource-based industries will require close co-ordination between the Ministries involved in the production of materials, active public-sector involvement, and the participation of aid-giving countries and agencies to ensure the success of the programme. The urgent need for a resource-based industrial sector in Sierra Leone makes a special effort necessary. The process of planning begins with an appraisal of the production situation in various primary sectors of the economy to determine the quantities of materials available for industrial utilization over and above the present consumption requirements. These primary sectors are fisheries, livestock, minerals, forestry and agriculture.

It is also necessary to project production data on the basis of development efforts now being made in each of these sectors. This investigation requires inter-ministry dialogue and discussion. This would be possible either by creating joint committees for each sector or by using the services of the economist who will be posted in the proposed industrial planning unit which is being established, to undertake a sector-by-sector investigation of primary industry. In either case, the active co-operation of the Ministry responsible for the primary sector is a prerequisite for success. This project will provide the documentation required for the task of data collection and analysis.

It is also necessary for the Ministry of Trade and Industry to take stock of the present situation in this field. This requires the collection and analysis of available reports both on resources and on their industrial utilization. This will enable the Ministry to chose projects for undertaking feasibility studies. Several feasibility studies have been carried out already. These include studies on a sardinella cannery, a cotton-polyester-blend integrated textile mill, a second sugar mill, an alumina project etc. It is proposed that these studies should be evaluated and that details of suitable

projects should be circulated to Sierra Leonean embassies in friendly countries to explore the possibility of obtaining development aid or investment for the implementation of these projects.

Concentration of industry in Freetown. The factors responsible for the concentration of industry in Freetown are the absence of infrastructure facilities outside Freetown, the choice of market-oriented commodities for production and the fact that most established industries are based on imported materials. The removal of this imbalance therefore requires an emphasis in future on regional development and on industries designed to:

(a) Process locally-available raw materials or to manufacture goods based on these materials;

(b) Exploit the reservoir of cheap labour available in areas outside Freetown;

(c) Exploit the non-urban domestic market for industrial products.

The proposed Development of Industries Act makes it a statutory responsibility of the Ministry to establish industrial estates in areas outside Freetown. A preliminary study has to be launched immediately to identify places where the proposed estates could be established and the industries suitable for establishment on each estate. The Ministry can then select a site for the first estate to be established in an area outside Freetown.

4. Capital-intensive technology

The previous chapter highlights another feature of Sierra Leone industry, namely the extensive use of capital-intensive technology for industrial development.

The reasons why most of the industrial establishments in Sierra Leone have chosen highly capital-intensive technology are partly that there has been no institution in Sierra Leone to brief entrepreneurs on what alternative technologies are available and which ones are most suited to Sierra Leone under the prevailing conditions. There has been an exclusive dependence on foreign consulting firms who tend to think in terms of capital-intensive technology and the choice of technology is left entirely to the foreign investors. Moreover, the Development Act of 1960 offered incentives and facilitated the tax-free import of technology and technical equipment without any evaluation of its suitability or its contribution to balanced development.

It is proposed that, in future, foreign consultants be required to list the alternative technologies available for each process and to give reasons for recommending any particular process.

The cost of technology is also important to developing countries with unemployment problems. It is therefore proposed that, at the time of evaluating projects, the investment cost per job created and the foreign-currency cost per year of maintaining each job created, should be worked out and presented in the report to the project-approval committee. It is visualized that strict project evaluation and the provision of tax incentives based on that evaluation will eventually enable the Ministry to ensure the selection of the most appropriate technology for each project.

5. Under-utilized industrial capacity

The previous chapter indicates that the amount of unutilized installed capacity in Sierra Leonean industry is considerable. In some developing countries, capacity utilization is controlled and improved by charging excise duty on a capacity basis. In some countries, legislative measures have been adopted to forbid the closing down of industrial plants without authorization. In Sierra Leone, these measures do not exist. The absence of a capacity tax does not oblige an enterprise to make special efforts to improve its capacity utilization, and, in the absence of any law, there are a number of factories which are lying closed without any fear of being penalized.

Capacity utilization can also be improved by promoting the export of industrial products. This is an issue which has been discussed fully in the previous chapter. Some additional recommendations appear under paragraph 7 in this chapter.

There are two kinds of reasons for under-utilization of capacity, those which are of a general nature (such as the small size of the Sierra Leonean market and competition with similar imported products) and those which are specific to particular enterprises.

General causes. As regards these, it is proposed that:

(a) Enterprises which are unable to utilize their capacity should be identified and asked to undertake a market-development study for their respective products within a specified period and to communicate to the Ministry the results of this study for further action;

(b) Imported products which compete with local products should be removed from the Open General Licence (OGL) list of imported items and brought onto the specific list which is directly controlled by the Ministry.

It is visualized that (b) above will enable the Ministry to ensure the maximum domestic market for locally-produced goods, and that (a) will encourage both the enterprises and the Ministry to develop the market for industrial products.

Specific causes. There are some which have come to the notice of the expert, and these indicate the need for a factory-to-factory study of the situation. The known cases are as follows:

(a) The Bennimix Baby Food Plant at Bo and the National Workshop at Freetown are unable to work to full capacity due to a shortage of working capital;

(b) The sawmills are unable to work to capacity due to difficulties in the transportation of logs from the forest to the mill sites,

(c) The rice mills have not been operating to capacity due to difficulties in the procurement of paddy;

(d) The palm-oil mills are not running to capacity due to problems in harvesting wild palm and the slow progress in establishing the new plantations;

(e) The fruit-processing company is unable to get enough fruit and vegetable to feed its plant to capacity;

(f) The match factory can neither produce quality matches nor utilize its full capacity due to defective equipment.

The problem of working capital appears to be serious in the case of those public-sector industrial projects which are not incorporated. It is obvious that once a company is established, a commercial bank can consider its requirements for short-term loans more promptly. It may be that, in some cases of initiating a project, the working-capital requirements are not estimated realistically and subsequently the problems of liquidity causes difficulty. In any case, the Ministry could undertake a study of this problem, factory by factory, and provide such assistance as is needed.

Idle industrial capacity. In addition to the amount of under-utilized industrial capacity, there are factories known to be closed and two industrial plants lying idle because they are not completed. The closed-down factories are:

(a) The clinker-grinding and cement-bagging plant. It is closed not only because the transhipment cost of clinker from the ship to the coast is high, but also because the same concern is also an importer of cement and does not favour the reactivation of this plant;

(b) The Italian Bakery has closed. The equipment installed is lying idle;

(c) A poultry-processing plant;

(d) The Dutch Ice-cream Factory has been closed for almost two years. It has recently been partially reactivated;

(e) A milk-reconstitution plant came into existence and then closed.

It is recommended that the closure of a plant on a permanent or temporary basis should require the authorization of the Ministry. This alone can enable the Ministry to investigate and identify the factors responsible for the shut-down and to find solutions to the problems. It is likewise necessary to penalize unauthorized shut downs. It is proposed that a provision to this effect should be included in the Development of Industries Act before it passes into law.

The two incomplete plants mentioned are:

(a) The toilet soap plant in the Washer Soap Factory. A visit to the plant in November 1978 revealed that the completion of this plant does not require much investment. It does, however, require authorization. Since the Channai toilet-soap plant has already come into operation, the commissioning of another plant of the same capacity will place both the plants in difficulty. However, there are advantages in having a second plant. Competition might result in improvement in quality, and a monopoly price situation will be avoided if the import of soap cake is banned or curtailed. The Liberian detergent factory has been trying to get union status in the Mano River Union. This was not approved because there was no corresponding plant at that time in Sierra Leone. It is proposed that now all the three plants (the detergent plant in Liberia and the two toilet soap plants in Sierra Leone) should be considered for union status;

(b) The rubber plant. In November 1978, the expert visited a shoe factory on the Wellington Estate. This was found to be equipped with two plants, one for producing canvas shoes and one for producing rubber footwear components. Both these plants were not in operation because of lack of expertise and because both the plants lacked some equipment. The entrepreneur was advised to obtain the services of a rubber technologist with experience in the shoe industry in a developing country. So far as is known, these plants have not re-opened.

In such cases, the Ministry can exert pressure for reopening, but, before doing so, it should know the reasons why these plants were closed and what efforts have been made or are needed to reactivate them.

6. High production costs

The data presented and analyzed in the previous chapter establishes that Sierra Leonean industry operates with high production costs. This is because:

(a) Industry in Sierra Leone is overcapitalized;

(b) Installed capacity is under-utilized;

(c) The investment package authorized for the establishment of industrial enterprises includes large foreign loans requiring repayment with interest;

(d) The cost of imported technical expertise has not been competitive;

(e) Salaries offered to expatriate employees have not been controlled.

In regard to (a), overcapitalization has to some extent been unavoidable because of the complementary investments in infrastructural facilities, but a look at the industrial establishments indicates that civil work has, by and large, been over-designed. Some industrial establishments have been planned and implemented as prestige projects.

It is difficult to determine how far the Development Act of 1960, which offers both tax-free import of building materials and also capital allowance at an abnormally high rate on buildings, is responsible for over-capitalization. A break-down of investment costs is not available for any enterprise.

It is necessary to prevent the establishment of over-capitalized industrial enterprises and this will be possible if the investment cost of each project received for approval is properly evaluated as will be required by the proposed Development of Industries Act when it comes into force.

It is likewise necessary to reduce the production costs of industry. This would be possible provided the services of a short-term consultant are obtained to undertake a study of the situation and recommend measures, both to the Government and to individual enterprises, for controlling and reducing production costs.

7. Underdeveloped exports

The previous chapter establishes the fact that Sierra Leone has failed to develop and capture export markets, despite the following favourable conditions:

(a) A reservoir of industrial capacity, surplus to the requirements of the domestic market, is available for export production;

(b) Export markets are available in the region and Sierra Leone's geographical location gives an advantage to local industry over its competitors from both the industrialized and developing countries;

(c) A number of items are being produced under licence and the quality of these items is competitive;

(d) Since most of the enterprises are based on modern, capital-intensive technology, the quality of the products of local industry in general is reasonable (with a few exceptions such as safety matches, knitwear, laundry soap etc.);

(e) The Government of Sierra Leone offers the possibility of reclaiming excise duty paid on production and import duty paid on materials.

In fact, industry prefers to allow its products to be smuggled to adjoining countries rather than exported through normal channels. Sierra Leonean industry is by and large owned and managed by trading communities with contacts and sometimes branches, in foreign countries, but these facilities are not being used to acquire a foothold in these countries for the goods produced in Sierra Leone.

The only adverse factor is the higher production costs, and these could be controlled and brought down to a reasonable level. For instance, a number of enterprises are over a decade old and thus their depreciation cost is minimal. It is possible to dispense with the services of highly-paid foreign personnel. In most cases, foreign loans have now been paid up with interest. Consequently, there does not appear to be any reason why products of local industry should not be competitive in price in the adjoining countries. Despite the favourable situation, Sierra Leone industry seems reluctant to move forward into the markets available for its products in the adjoining countries.

There is an UNCTAD/GATT International Trade Centre project for export promotion operating in the Ministry of Trade and Industry and an export promotion council is likely to be established soon. This is a step in the right direction. It is hoped that the International Trade Centre project and the export promotion council will undertake research to identify both the psychological and economic obstacles to exporting. Such a study would pave the way for the export of industrial products through normal channels.

It is also necessary to identify which products Sierra Leonean industry is in a position to export and which are in demand in the adjoining countries (Gambia, Ghana, Guinea, the Ivory Coast, Liberia, Nigeria, Senegal).

The International Trade Centre project can identify the items in demand in neighbouring countries. As regards items available for export, on the basis of surplus capacity, quality, and other consideration mentioned above, these could be as follows:

Food, beverages and tobacco

Cigarettes
Beer
Alcoholic beverages
Biscuits

Confectionery

Palm oil (this will be possible when the Dara and Gambia Mattru projects reach capacity)

Wheat flour

Frozen shrimps, lobsters, sardinella (export to countries outside the region)

Solar salt (after the completion of the Osman Thomas project)

Chemicals, petroleum and refinery products

Refinery products (items to be identified separately)

Soap

Paint

Candles

Cosmetics, aromatics and insecticides packed under licence, provided known foreign trade marks are also acquired

Plastic, rubber and allied products

EVC beach sandals

Plastic footwear

Suitcases

Foam mattresses and other foam products

Plastic bottles (baby feeders, if produced, will have a good market) and polythene bags

Textiles and textile products

Ready-made garments

Knitwear

Other products

Terrazzo and marble tiles

Framed mirrors

Springs and spring mattresses

Nails

Cartridges

Further investigation is of course needed to pick out the items with the most promising prospects.

It is proposed that the Ministry should form a team to work out the export economics of each item and to propose measures to make it attractive for the producers to export.

It is further proposed that the Ministry should explore the prospects of using import licensing as a lever to boost exports. In this respect, the following suggestions are offered for investigation and consideration:

(i) The import of certain items should be allowed only against export performance guarantees;

(ii) The import of industrial materials above a certain ceiling should be made dependant on export performance;

(iii) Where an industrial enterprise is owned by a commercial house, the commercial imports above a certain ceiling should be made dependant on the export of industrial products.

In short, import policy has to be made export-oriented.

8. Overdeveloped imports

The corresponding characteristic of industry highlighted by the data presented in the previous chapter is its import-happy nature. The data presented establishes that this is due to the fact that industry in Sierra Leone owes its birth and growth to the foreign import houses established in Sierra Leone during the pre-independence era. After independence, these houses branched out into the industrial field, but only such industries were established as could protect and advance their import interests.

It is because of this background that the value added, and particularly the domestic value added, of Sierra Leonean industry is in most cases negligible. This is further substantiated by the contribution made by industry to the gross national product, i.e. 7%. Another interesting fact established in the last chapter is that the annual import liability of industry, if run to full capacity, would amount to about 66% of the annual export earnings of the country.

The first prerequisite is to freeze the growth of industry with low value added. This will be possible if the policies and procedures outlined in the proposed Development of Industries Act are fully applied. In that event, it will not be possible to authorize an industrial project whose balance-of-payment effect is not positive.

The second obligation is to ensure that existing industries are guided to improve their value added and to curtail their import liability. This appears difficult but is nevertheless possible. With close co-operation between industry and the Ministry, and with the availability of advisory services, it is visualised that the present import liability can be brought down by 10 - 25% in the foreseeable future. Import curtailment and self-reliant growth are possible provided industry agrees to:

(a) The replacement of imported materials by locally-available substitutes;

(b) The in-plant production of certain intermediates at present imported;

(c) The introduction of certain changes in the product range;

(d) The introduction of structural changes in certain industries to ensure interdependence.

A guide-line for industry, worked out on the above basis, forms the subject matter of the chapter that follows.

IV. THE GROWTH AND DEVELOPMENT PROSPECTS OF PRESENT INDUSTRIES

All the information required for an assessment of the growth and development prospects of each individual enterprise is not available. Such an establishment-by-establishment assessment may not be possible. However, the Ministry of Trade and Industry arranged for the expert to visit 21 factories in Freetown on his arrival in November 1978. These visits provided an opportunity to form certain impressions about industries and establishments and to discuss certain features with the management where this was possible. These impressions and discussions provide a starting point for this study.

The data presented in chapter II has already shown that:

(a) Sierra Leonean industry is at present utilizing 51% of its installed capacity in overall terms;

(b) The CIF cost of the materials imported by industry is equivalent to 59% of its gross output value;

(c) The balance-of-payment effect in the case of most establishments is doubtful or marginal because of several other foreign-currency liabilities such as interest on foreign capital borrowed, profits on foreign investment, salaries of expatriate personnel, royalties etc.;

(d) Value added by most industrial establishment in Sierra Leone ranges between 10 and 20% of the gross output value.

It is evident from (a) that horizontal expansion is, in most cases, not possible. An improvement in the situation outlined at (b), (c) and (d) requires vertical growth and development. In some cases, diversification might be feasible to make optimum use of facilities which are not at present being fully utilized.

There are two requirements common to the entire industrial sector, spare parts and packaging materials. The bulk of these are at present imported. The time is not yet ripe to initiate the production of spare parts on a commercial scale. However, the prospects for developing a packaging industry look more promising and so consideration of this sector precedes the appraisal of the prospects of other industries.

A. Packaging industry

Industrial products are packaged both for commercial presentation and for the protection of the goods during transport and distribution. Sierra Leone industry uses:

(a) Packages, boxes and cartons made of paper, grey board, cardboard, kraft paper, corrugated paper etc.;

(b) Plastic bags, bottles and containers made of polythene, PVC and other plastic resins;

(c) Tin containers, printed and unprinted, coated and uncoated;

(d) Glass containers and bottles;

(e) Sacks made of cloth, jute, kenaf or urena lobata.

A specialized study is needed to determine the requirements of local industry for each type of packaging materials mentioned above and to assess the present product mix and capacity of Sierra Leone's packaging industry. It is assumed that this will form part of the feasibility study if the proposal outlined below finds favour with all concerned.

1. Cartons and packages of paper and board

The packaging industry, capable of producing cartons for distribution and commercial product packaging, consists of:

(a) UNIPAC (United Paper Company) which is equipped for producing cartons from grey board. This enterprise has equipment for cutting, bending and stapling operations but not for glueing kraft-liner layers or fluting or corrugating. Consequently, load-bearing containers suitable for shipment or transportation of heavier products are not yet produced;

(b) The printing industry, which is composed of 10 printing presses. Some of these are equipped with convertors for producing commercial packaging for light-weight products. The existance of this industry obviates the need for importing cardboard and folding box-board printed packaging and cartons used for the local distribution of light products. However, instead of using this facility fully, both packages and cartons are being imported on the ground that the imported packaging materials are more suitable for the products.

It is therefore proposed that:

(i) Packaging material should be removed from the Open General Licence list and transferred to the specific list of importable items;

(ii) The import of packaging materials which can be produced locally should be banned or severely restricted.

At present, packaging materials are being imported because the capacity of the local packaging industry is too limited to cater for all the requirements of industry and trade, and also because the types of packages now produced, or

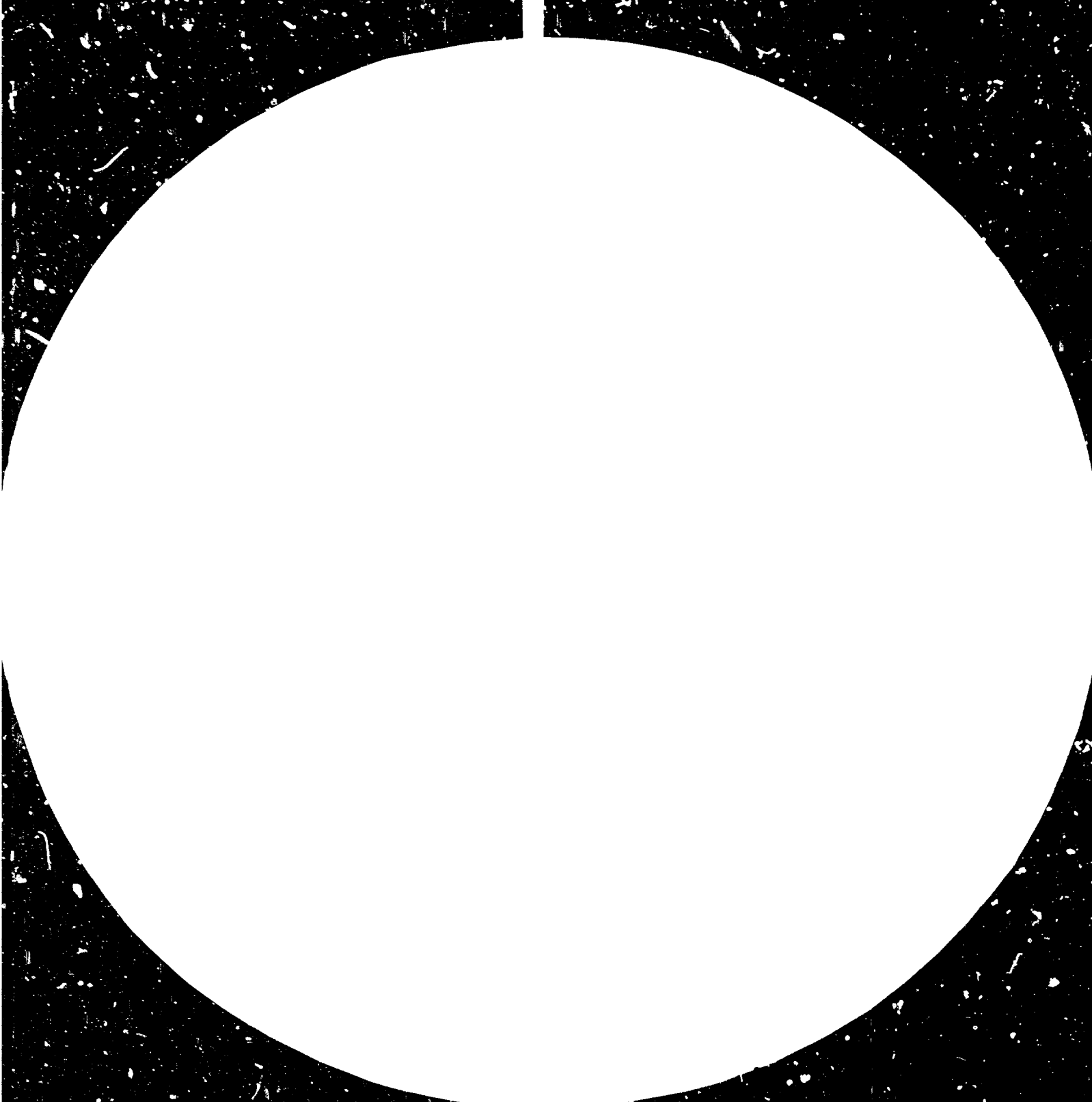
which can be produced, do not serve the needs of all industries and all products. It is a fact that neither UNIPAC nor the printing establishments equipped for converting cardboard into packages can produce all types of cartons and commercial packaging. UNIPAC is not even moderately well equipped and is unable to produce cartons from multi-ply kraft liner and corrugated fluting. Similarly there is really no well-equipped unit for producing product packaging. Printing is a business in itself and the facility for conversion of cardboard into packages is only a small sideline.

The requirements of local industry, though not yet assessed, seem to justify the establishment of a modern packaging unit. Products using imported cardboard packages are cigarettes, biscuits, cartridges, knitwear, footwear, toilet soap, cosmetics, school chalk, ice cream, consumer packets of wheat flour and other food items. Such a unit, if established, would cut the import of packaging material on the one hand, and would enable the Government to assess the prospects for establishing a small-scale board-making plant in Sierra Leone. It is therefore proposed that UNIPAC be asked to develop and present to the Ministry an appropriate scheme for creating a modern packaging unit equipped for producing cartons of all sorts as well as cardboard packaging. The scheme should include package designing, multicolour printing, cardboard converting and coating, gluing of kraft-liner layers, corrugating etc. If UNIPAC agrees to consider expansion, the best thing would be for them to seek the collaboration of some firm capable of undertaking a feasibility study and subsequently implementing the proposed project.

If UNIPAC is not interested in expanding into a new and different production line, an alternative suggestion would be for UNIPAC to concentrate on its present line of production, equipping itself to diversify its product range, while one of the printing presses (preferably the one which is already producing packages for baby food) could be encouraged to develop itself into a modern packaging unit. It would be necessary for this press to equip itself with a package-design department, and to enlarge its printing capacity to cover multicolour printing and its packaging department to cover cardboard and folding box-board packages of all types and sizes.

2. Polythene bags and plastic containers

There are two factories in Freetown equipped with extruders. One has half a dozen or more extruders for producing polythene film and the other has only one

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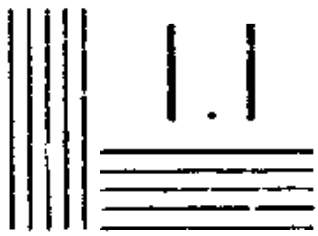
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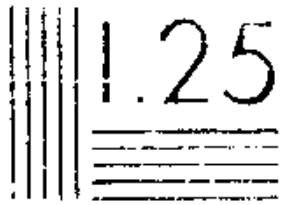
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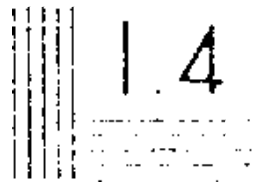
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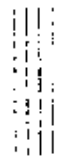
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extruder but this is relatively more modern and has a higher capacity. Production capacity in this sector is large and the industry is even capable of producing inner bags for fertilizer and several other products for which double packing is needed. There is scope for market development and both these enterprises have now to channel their efforts in this direction. Export prospects also exist. One firm has branches outside Sierra Leone and is therefore in an advantageous position to secure orders from adjoining countries.

The only other plastic packaging in production is blow-moulded bottles. In this field, there are also two factories and production capacity is more than adequate. This makes product diversification and market development necessary. The expert, during his visit to one of the factories, advised the management to become a member of a "mould bank" in Europe. This would facilitate diversification. Immediate possibilities are baby feeding bottles and dolls.

There is no injection-moulding plant capable of producing hard containers, domestic utensils etc. One firm has imported a very small machine to produce stoppers for its bottles. It would also be possible to diversify the production of this small machine.

To ensure the largest possible share of the domestic market to this industry, which already has excess capacity, it is proposed that the import of plastic packaging material should be banned. Secondly, the enterprises should be advised to consider product diversification and market development, including export, and should inform the Ministry of the results of their respective efforts.

3. Tin containers

One-gallon tin containers are at present being produced by the paint factory for packing its own paints. The prospect for developing a container industry in Sierra Leone at present appears to be modest. Industries using or expected to use tin containers are:

Edible-oil mills
Beverage plant
Brewery
Fruit-juice cannery
Biscuit and confectionery factory

Glass containers compete with tin containers. Sierra Leone has materials for producing glass containers (both silica sand and fuel oil) but the modern trend is to can soft drinks, fruit juice, beer and refined edible oil (whether hydrogenated or not). Packing costs in both cases (glass or tin container) are almost the same. Sierra Leone is not at present canning fruit and vegetables but, if the newly-established factory at Mabole starts canning, tin containers will have to be produced locally. A glass-bottle plant, for which a feasibility study has been carried out for the Mano River Union, could be established in Liberia and thinking in the Union Secretariat favours its establishment in that country. In the circumstances, it is proposed that a prefeasibility study on the establishment of a plant for producing tin containers should be carried out. This study might also compare the feasibility of glass and tin containers.

4. Glass containers

As stated in the last paragraph, a feasibility study for a glass-bottle plant is available and the plant, whether established in Sierra Leone or Liberia, will have union status. To ensure the financing of this project, it would be advisable to settle the location of the plant. This, in all probability, will be a political decision. The feasibility study establishes the fact that consumption of glass bottles is growing at a faster pace in Sierra Leone.

5. Sacks made of cloth, jute or urena lobata

A project for the establishment of a gunny-bag factory based on urena lobata has been under consideration since 1977. The National Development Bank is financing the project. In a meeting held recently in the Ministry of Development on the fertilizer-blending and -bagging plant, a representative of the Bank stated that, during the initial phase of the project, bags will be produced from imported, synthetic fibre. Thus, the utilization of a locally-available fibre, urena lobata, is still a matter for the future.

The demand for bags and sacks is likely to grow next year when the sugar mill goes into production, the fertilizer-bagging plant is established and the cement-clinker grinding and bagging plant is reactivated. It is therefore proposed that the Ministry may take some interest in the project and ensure its establishment as early as possible.

B. Food, beverage and tobacco industries

1. Fish processing and freezing

Sierra Leone has an industry providing cold-storage and transhipment facilities to the foreign companies authorized to fish in Sierra Leonean waters. Prospects for the establishment of an export-oriented sardinella cannery have already been assessed but no action seems to have been taken to implement this project. A similar situation relates to the authorized integrated fish-meal plant.

The growth of industries based on fishery resources will be possible only after a radical change has taken place in the present policy of granting fishing rights in exchange for a modest trawler registration fee and a nominal fish-catch tax. The change required in the policy has to be such as to make it obligatory and profitable for the fishing companies to land their entire catch on the coast of Sierra Leone for industrial processing and canning prior to export. This change can be effected gradually but will be beneficial only if adopted jointly by all the countries in the region.

Sierra Leone at present imports fresh and processed fish to the value of around Le 2 million a year. It is true that the per-capita consumption of fish in Sierra Leone is abnormally high, i.e. 18 to 22 kilogrammes per year. But Sierra Leone has a sizeable fish resource capable of providing enough fish to meet local demand and for export to earn foreign currency. It is proposed that fish imports should be gradually reduced and then stopped. The import of processed fish is a handicap to the growth of a local fish-processing industry. A restriction of fish imports would be an encouragement to investors in this industry.

2. Meat production

Sierra Leone consumes around 12,000 tons of meat per year. To meet this demand requires 66,000 cattle of which 63% are imported from Guinea.

Freetown has the largest slaughter house. According to 1968 data, 7,269 cattle were slaughtered in that year. Other slaughter houses where more than 100 cattle are slaughtered per year are located at Koidu, Bo and Magburaka. Fifty per cent of the cattle are slaughtered in the eastern province. 30% in

the western and 20% in the northern province. Two modern abattoirs have been planned and are being built at Makeni and Freetown.

Sierra Leone has to develop a livestock industry to overcome the present deficit in cattle. The interim solution lies in the development of poultry farming on a very large scale. There are at present three small hatcheries, three feed mills and three poultry-processing plants. Sierra Leone could, with the assistance of FAO, develop an integrated project for poultry development.

The poultry-feed industry is heavily based on imported inputs. Feed is composed of maize (around 50% of the total), proteins (15 to 20%) vitamins, minerals and roughage or filler (35%). Sierra Leone is deficient in maize but production is growing. It is necessary that the poultry-feed industry should use local maize and supplement this with cassava. If the import of maize is stopped, it would be possible for the industry to use cassava chips instead. Similarly, imports of proteins could also be stopped, particularly if fish meal is likely to be produced locally. Palm oil and palm-kernel cake are available as a source of protein. The industry can produce blood meal if necessary.

Although 66,000 cattle and a similar number of sheep and goats are slaughtered annually, there is not a single tannery in Sierra Leone. Prospects for a tanning industry are discussed in section F, paragraph 1 of this chapter.

3. Milk production

Sierra Leone spends about Le 4 million in foreign currency every year on the import of reconstituted milk in bottles, evaporated milk, cheese and cream in cans, powdered milk in consumer packs and butter.

No effort seems to have been made so far to raise dairy cattle, although conditions are suitable. Some serious attention in this field is needed.

It would be possible to replace the imports mentioned above by establishing a milk-reconstitution plant based on imported milk powder. Before sponsoring such a project, however, it would be necessary to find out why the Fan Milk Reconstitution Plant, established in Freetown in the nineteen-sixties, did not survive and also to determine the balance-of-payment effect of the proposed project. If the Ministry is interested in such a project, a prefeasibility study can be undertaken.

4. Wheat-flour milling

Sierra Leone does not produce wheat and does not seem likely to do so. Wheat flour is not a staple food in Sierra Leone. The reason for establishing a 50-ton-per-shift wheat-flour mill is not clear. However, industry promotes consumption and since the establishment of the Seaboard West Africa Flour Mill, consumption of wheat flour has gone up considerably. A comparison of the CIF price of wheat imported by Seaboard and wheat flour imported by National Confectionery Ltd. (NATCO) reveals the following situation in 1977/78.

	Leone	As a percentage of CIF price of wheat
CIF price of wheat per 100 kilogrammes	10.53	100
CIF price of wheat per 100 kilogrammes after adjusting for 24% mill feed and its price	12.63	120
CIF price of wheat flour imported by NATCO	12.69	120
Ex-factory sale price of Seaboard wheat flour	19.51	185

It is apparent that it is more economical to import wheat flour than to import wheat and produce flour locally. The table also reveals that grinding charges are estimated at 55% of the cost of Seaboard flour, which is abnormally high.

Again the amount of mill feed extracted is too high at 24% of the wheat. In 1977/78 it was 27%. It would be more economical to produce wholemeal. But, if fine flour is needed, the amount of mill feed can be brought down to 10 - 15%. Sierra Leone is at present spending scarce foreign currency to the value of Le 7 million per year on the import of wheat and this liability is growing. At the same time, wheat flour is also being imported for sale in supermarkets.

It would be possible to produce maize and sorghum flour in the same mill after making certain adjustments to the plant. Since these are local crops, it is proposed that the required adjustments should be made. The possibility of selling a blend of wheat, maize and sorghum flour in the market should also be explored as, at present, the wheat-flour mill is an uneconomic industrial enterprise. It is necessary to make this overcapitalized mill (see chapter II) economically more feasible as soon as possible on the above basis.

5. Rice milling

Rice is the major staple food and consequently the major crop of Sierra Leone. The paddy produced is husked in villages in the houses. Only paddy supplied to urban areas is husked mechanically. For this purpose, there are four mills, all in the public sector and managed by the agency responsible for the procurement of rice. It has not so far been possible to utilize fully this small rice-milling capacity (5 tons per hour) due to the prevailing and increasing rice shortage, although the land is reported to be ideal for rice cultivation. It is obvious that modernization or expansion of the rice-milling industry is out of the question until rice production increases. It is also not advisable to divert resources from rice cultivation to the industrial utilization of by-products, at present wasted, such as paddy straw, rice bran and rice husk, although it is obvious that, in the long run, waste utilization would improve the economics of paddy cultivation.

To improve the capacity utilization and the management efficiency of the rice mills, it is proposed that:

(a) Either the rice mills should be transfered to private enterprise with authorization to procure paddy directly from the farmers at a price not less than the minimum commercial price fixed by the Government;

(b) Or that a subsidiary company should be established to run each mill on commercial lines.

6. Edible-oil industry

Sierra Leone has vast and rich resources of palm fruit, palm kernels, groundnuts and coconuts. Despite the extent of these resources, Sierra Leone imports as much as 5,500 to 7,300 tons of fixed, processed vegetable oils and animal fats per year at a cost of approximately Le 5 million. (For details see the foreign trade statistics released by the CSO.)

This seems paradoxical and to understand it, a penetrating look at the structure of the edible-oil industry in Sierra Leone is necessary. Proposals for improving the situation are given under each heading.

Rural industry based on wild palms. The exploitation on a commercial scale of the available resources of wild palm (39 million trees) has been found to be difficult, firstly because of the problems of sterilizing the fresh fruit bunches for oil extraction within three hours or so after plucking.

Secondly, trees are not located close to each other even in areas infested with oil palm. Thirdly, the wild oil-palm tree is too tall for the fruit to be harvested with ease. This resource is at present, used mainly to supply the rural cottage industry based on boiling and manual pressing of palm fruit for oil extraction. It is evident that oil extracted in this manner is rich in free fatty acids but it appears that the rural population has become accustomed to consuming oil with a high percentage of acidity.

Modernization of the rural palm-oil industry would be necessary to achieve better yields, increased production and improved quality both for urban and rural areas. Such an improvement is long overdue. Some experts have proposed the introduction of static-screw presses for oil extraction. However, this is not only a problem of equipment. There will also be a problem of ownership and management if the organization of production is raised from the home to the village level.

It is therefore, proposed that in a selected wild-palm area, a pilot plant be established with the aim of standardizing capacity, equipment, technological process and yield on the one hand, and ownership and management on the other. Once standardization is achieved, a programme for the development of this industry on that basis in rural areas can be worked out.

If this proposal is approved, a scheme for the suggested pilot centre will be prepared by this project and presented to the Ministry.

Industry based on oil-palm plantations. The problem of wild-palm exploitation obliged the planners to design and use a pattern of development based on an agro-industrial complex comprised of a plantation and an oil mill. Two projects of almost similar size and capacity, one at Bara and the other at Gambia Mattru, were established, one with International Development Association (IDA) assistance and the other with that of the Economic Commission for Africa (ECA). This experiment seems to have proved a success and, as a consequence, private enterprise has developed a similar project for establishment at Mokai. The European Economic Community (EEC) has shown an interest and is financing a feasibility study.

Palm-oil production has to be expanded not only to supply the present needs of the domestic market but also to provide a margin for export. In the agriculture-based industrial sector this could emerge as the single largest earner of foreign currency. It is, therefore, proposed that a team of two

experts, one from FAO and the other from UNIDO, should be formed to develop a 10-year programme for the expansion of this industry on a large scale. This team would not only cover all the aspects of development, such as choice of palm-oil variety, size and location of plantations etc., but would also propose measures to reduce the costs of pre-investment, investment and operation.

Palm-oil mills managed by SLPMB. As in the case of the rice mills, it is proposed that SLPMB should either transfer the eight palm-oil mills under its control to private ownership or establish a subsidiary company whose task would be to add a plantation to each mill to make it self-sufficient in raw materials and to see to the replacement or modernization or expansion of each mill.

Palm-kernel oil mill. This is the largest oil mill in the country, able to produce 10,000 tons of oil annually. The entire production is exported. This mill does not always utilize its full capacity because of the short supply of kernels. Improvement in supply depends upon the price offered, which in turn has to be fixed in relation to the prevailing FOB price of kernel oil.

Edible-oil refinery. To replace edible-oil imports, and to add value to the export of palm-kernel oil, it is necessary to plan and establish a vegetable-oil refinery with or without a hydrogenation or hardening plant. A recent quotation indicates that a 20-ton-per-day refining unit equipped with a hydrogenation plant would cost only £298,675 (sterling). It is understood that SLPMB, on the advice this project, has already hired a consultant to undertake a feasibility study.

The prospect for exporting refined and hydrogenated oil to adjoining countries has also to be explored. Implementation of this project, on a priority basis, is recommended.

Groundnuts. Cultivation of groundnuts in Sierra Leone covers an area of 34,000 acres or more. Production is around 15,000 tons per year (source: 1972 census). Groundnut oil required marginal hydrogenation. The yield of oil per ton of groundnuts is also very high.

There is only one privately-owned mill, at Bo, equipped to extract oil from groundnuts. This has a capacity of 5,080 tons per year. No data about the performance of this mill is available. The Ministry could evaluate the performance of this mill and base its future plans for the exploitation of groundnuts for edible-oil production on this evaluation and on the experience gained by this mill.

Coconut. This resource has so far remained unutilized. It is now understood that FAO has started research into developing a coconut plantation based on an improved variety. It is proposed that any such project should be for a complex composed of a plantation and an oil mill. It is further suggested that the proposed FAO/UNIDO team could also be charged with preparing this project.

7. Baby-food production

FAO has established a pilot project at Bo for producing baby food based on locally available grain. This project is at present managed by the Ministry of Social Welfare. The project has social objectives which can only be achieved if the project is commercially viable. It is therefore proposed that this project should be provided with a corporate structure and funds to improve its liquidity.

8. Salt production

There are, at present, two enterprises in Sierra Leone, one of whom grinds imported salt and the other produces solar salt. They are as follows:

Salt Manufacturing Co. Ltd. Kissy Dockyard. This Company imports around 10,000 tons of solar salt annually from Senegal or Egypt for grinding, packing and local sale. The value added in this industry can be hardly 5 - 10% and the balance-of-payment effect could be negative. If this company had equipped itself with a refinery and a granulation plant for producing table and refined salt, the value added would have been, higher, in the opinion of the expert.

Osman Thomas Company. This company has established a project for producing solar salt. This enterprise was the subject of a study to develop a project of union status.

Union-status project. The Mano River Union Secretariat used the services of a firm of consultants to prepare a project of union status. These consultants established a union market of 25,000 tons and proposed the expansion of the Osman Thomas project to achieve the union consumption target. This project covers all the processes, salt production, refining, granulation, grinding and packing and is therefore a composite project of the type required. However, the cost of infrastructure (housing for the work force, a long approach road and harbour facilities) is so high that the project may not be economically feasible and may not be implemented.

Formulation of a new project. In the circumstances, another feasibility report may be needed for this project. It seems, advisable to present below some imperatives of this industry to enable the Government to draw up terms of reference for a new study.

(a) Market. Market investigation is needed to estimate the consumption of salt in the Union and in Sierra Leone for domestic, animal feeding, fish preservation, tanning and industrial use.

As regards the last item, reference should be made to the Alsuisse project for alumina production. It is not known whether it is proposed to produce caustic soda for this project locally, but if this is so, it will be more feasible to plan one large project which can also meet the requirements of the proposed caustic soda plant;

(b) Technology. Salt can be produced by evaporating the water content with solar heat or with artificial heat.

The former technology is labour-intensive but is more suited for areas where the rainy season is not very long. Sierra Leone has a coastline of 405 miles and it should be possible to find coastal areas where the labour supply is abundant and the rainy season is short.

The latter technology is capital-intensive. Operational costs are also high due to the rise in the price of fuel. This should be considered only as a last resort. The consultants must provide comparisons of the investment costs and the operating costs of the two technologies;

(c) Location. The area where this project is to be located should have the following characteristics:

(i) A bay where the rising tide can fill the reservoirs, obviating or reducing the need for sea pumps which are very expensive

(ii) At least 3 to 3.5% salt throughout most of the year in the sea water used for evaporation;

(iii) An abundance of available labour;

(iv) A short rainy season.

UNIDO could provide expertise for this study. Since the project is of vital importance to the country's economy, it is proposed that UNIDO should be formally requested for assistance with this project.

9. Alcoholic beverages

Sierra Leone has a brewery, a distillery and two bottling plants for imported wines:

The brewery represents the single largest industrial investment in Sierra Leone. It produces one local brand of beer, Star, and two foreign brands under licence, Heineken and Guinness.

All materials used, malt, hops, flavouring, bottles, stoppers and cartons are imported. In 1978, the imports cost about Le 3.5 million in foreign currency, equivalent to 37% of the brewery's gross output value. As regards packaging materials (bottles, crown corks and cartons), the proposals made in section A, paragraph 1 should be considered in consultation with the brewery. Hops and flavourings cannot be replaced by any local products. As regards malt, the possibility of replacing this basic material by a local substitute should be considered. The food shortage apparently does not permit the use of rice and maize for brewing. But, if the brewery could develop its own farm to grow the grain required, the Government might consider proposals to provide such assistance as may be needed. This would make the brewery an agro-industrial complex.

The foreign-currency liability of the Brewery is not restricted to imported materials. The production costs of the brewery are composed of materials (37%) spares (5.4%), depreciation (4.5%), maintenance (11%), utilities (4.6%) and others (8%).

The first three items of these costs are almost entirely in foreign currency.

In the case of personnel, 45% of the cost appears to be in foreign currency, which is very high. A similar situation exists in the case of administration and maintenance costs. It is therefore proposed that the brewery be advised to review its foreign currency costs with a view to bringing these down and should inform the Government of its plans.

The brewery is well equipped and well placed to build up exports of its products, in particular those under licence. It is proposed that the brewery should draw up an export plan and inform the Government of the export targets which could be achieved during the next three years. The brewery should also indicate if any additional incentive is needed for exporting, giving full reasons for consideration by the Government.

Brewer's wash is at present wasted. Production of yeast from this waste is possible. The brewery should be asked to prepare and present to the Government a scheme for yeast production. If necessary, the collaboration of the three

feed mills operating in Sierra Leone could be sought to estimate the demand for the brewery's production of yeast. The possibility of its export to adjoining countries, wherever a poultry or animal-feed industry exists, can also be investigated.

The distillery was established in 1962 for the specific purpose of distilling locally produced alcohol called "omole". This alcohol was being illegally produced for local consumption in its raw state. It was decided to restrict production through a licensing system and to channel it entirely to the distillery for purification and blending with imported concentrates of whisky, gin, rum, brandy, vodka and africoco prior to bottling and sale.

One of the main problems faced by the distillery since its establishment is competition from imported spirits. It appears that the distillery is unable to compete with imports primarily because of the relatively high prices of its products. This is said to be largely on account of the price of the local alcohol which is reportedly three to four times more expensive than imported alcohol. The reason for the price differential is not known and it is proposed that a study should be made to investigate the matter and to make recommendations to improve the situation. If it turns out that the price of "omole" cannot be substantially reduced because of its base, a cheaper alternative source of local alcohol may have to be found.

One possibility would be alcohol from molasses which will soon become available from the sugar mill being established in Makunta with assistance from the People's Republic of China. A distillery with a capacity of 6,000 litres per day will be an integral part of the project. The prospects for utilizing cassava for the production of alcohol also seem promising. It is proposed that the management of the distillery should be requested to assess the feasibility of such a project.

The import liability of the company is 59% of its gross output value. The possibility of reducing this is small because imports of concentrates presently cannot be replaced by local flavorrings. However, the distillery is in a position to export. In fact, it is producing africoco, a liqueur made from cocoa and coconut extracts, primarily for export. By increasing its exports, the distillery would be able to offset its import liability to some extent. Moreover, it would enable the company to benefit from economies of scale (i.e. to reduce its overhead costs per unit output) which is not possible at present because of the small domestic market. It is therefore recommended that the management should be requested to submit proposals on exports and export targets for the coming three years, with or without any additional incentives.

Another development in this field is under way. An Austrian firm initially presented a proposal for the production of vinegar from non-marketable fruits and the waste from the Mabole Fruit Company. Subsequently, the proposal was expanded to cover the production of dry baker's yeast, making use of the molasses likely to become available from the sugar mill. It is further visualized that the plant proposed by the firm will produce raw alcohol which could be distilled into pure alcohol by the Wellington Distillery. The Austrian firm is expected to employ a consultant to formulate a detailed proposal based on the ideas mentioned above. It is proposed that the scope of this study should be widened to explore the possibility of making the three plants interdependent.

The bottling plants. Wine is not produced locally nor do there appear to be promising prospects for its production. Only bamboo or palm wine is produced locally by tapping the palm tree and is consumed fresh. As such, the import of wine has to continue. It is bottled under licence by two private enterprises and the distillery. Whether there is any foreign-currency saving in importing wines in bulk and bottling them locally is not known. Since bottles are also imported, it would be interesting to ask the bottling plants to present data for a study of this question.

10. Non-alcoholic beverages (soft drinks)

There are two soft drink plants in Sierra Leone and both are engaged in producing synthetic drinks based on imported extracts. Other ingredients, bottles, crown corks and crates are also imported. The situation relating to packaging materials has already been discussed.

It is proposed that the Mabole Fruit Company might produce concentrates of citrus, mango and lemon for the two bottling plants. This would not only reduce dependence on imports but would also establish the interdependence of the beverage plants and the fruit-processing company on a firm basis. There are so many synthetic drinks on the market that establishing new drinks may be difficult. Mabole should help the beverage industry in developing marketable soft drinks based on their fruit-juice concentrates.

Ginger ale is a soft drink produced locally for which essential oil of ginger is at present imported. National Confectionery Ltd. also imports 'gingerine' for the production of ginger biscuits. Alcohol-free ginger beer is produced in every household in Sierra Leone for consumption. Ginger is

grown abundantly in Sierra Leone and is cheap. The Mabole Fruit Company could be asked to assess the prospects for industrial utilization of ginger as well as for developing a commercial drink similar to the ginger beer produced domestically. The possibility of exporting "gingerine", if produced locally, could also be assessed.

11. Confectionery and biscuits

National Confectionery Ltd. (NATCO) produces both confectionery and biscuits from imported materials and uses imported materials both for product packaging and for distribution. NATCO spends Le 2.78 million annually on the import of materials alone and this amount is equivalent to 67.51% of its gross output value.

The major items of import are:

	Percentage of total imports
Sugar	23
Glucose	10
Fat	6
Wheat flour	12
Total basic materials	51
Chemicals	10
Packing materials	31
Spares	2
Machinery replacement	6
	100

It will not be possible to do without imported sugar even after the first sugar mill at Mamunta goes into production. Liquid glucose can be produced from maize and possibly also from cassava, but demand does not justify the creation of this facility. The import of fats will be eliminated when SLPMB succeeds in establishing an edible-oil refinery equipped with a hydrogenation plant.

NATCO does not use wheat flour produced by Seaboard West Africa Flour Mills because this tends to be more expensive than imported flour and also because its type is different. Since wheat is, in any case, imported and Seaboard cannot meet the demand of the entire country for wheat flour, there may not be any sense in obliging NATCO to buy wheat flour from Seaboard West Africa. What NATCO should concentrate on is:

(a) The replacement of imported packaging materials by local substitutes;

(b) The export of biscuits and confectionery.

It might be considered whether NATCO needs some additional incentive to increase exports. For instance, if NATCO were given a monopoly of the import of biscuits and confectionery of the types it does not produce, up to a ceiling not higher than the average of the last three years, it might be possible for NATCO to export 20 to 33% of its production, in the expert's opinion.

12. Cigarettes

Aureol Tobacco (an Anglo-American enterprise) produces cigarettes from tobacco of which only 15% is local and the remainder imported. It is understood that a subsidiary of this company is trying to grow tobacco but progress is apparently very slow. The Ministry of Agriculture could be advised to evaluate this attempt and to reinforce the programme, if necessary. The wrapping and packaging materials used are 100% imported. As already proposed, the development of a local packaging industry should receive priority as this is the only common requirement of all industries where imports can be replaced with convenience.

The prospects for exporting cigarettes are promising. It is therefore proposed that the management of Aureol Tobacco should be advised to present a programme indicating export targets for the next three years.

C. Repair and service workshops

1. The effect of import policy on the growth of the repair and servicing industry

The repair and service industry owes its birth and growth to the government policy of permitting the import of vehicles and domestic electrical appliances free of restriction as to source, size or type. Sales promotion has obliged the importers to equip themselves with facilities to offer after-sales service. This import policy, which brought into existence a repair and service workshop for each brand of vehicle or domestic electrical appliance imported, has, however, discouraged the development of a local manufacturing industry in the automotive and electrical fields.

This import policy also made it difficult to achieve standardization in repair and service facilities. The industry is at present geared not to repair faults but to replace components. It is evident that this type of repair and service industry is a luxury for a developing country.

2. An import policy to encourage manufacturing industry

It is probable that the large increase in the price of petroleum will oblige the Government to reshape its import policy to achieve economies in the

consumption of energy. It is very likely that the import of cars of more than 1,300 cubic centimetre capacity will be restricted and similar restrictions imposed on air-conditioning and refrigeration plants.

However, to promote manufacturing industry, it would be necessary to limit imports to certain specific brands. If this policy is adopted, it should be possible to negotiate the creation of assembly or manufacturing facilities of some sort. Even if this cannot be arranged, the demand for spares of the brands chosen for import will make it commercially feasible to produce some of the spares locally. The evident commercial viability will be an incentive to private enterprise.

3. Items suitable for local manufacture

In the initial stages of developing manufacturing industry in this sector, the following products should be considered:

Automobile parts

Lead accumulators (car battery)
Spark plugs
Leaf springs
Silencers
Oil and air filters of all sorts
Cut-outs
Ignition coils
Rubber components (car mats, wipers, hoses etc.)

Electrical parts

Electric wire and cable for domestic use
Conducting pipes, used for concealing wire
Electrical accessories, such as switches and plugs of all sorts
Lighting appliances
Domestic appliances, such as electric irons and kettles

Assembly plants

It would be possible to start assembling small items such as radio sets. Plants for the assembly of bigger items, such as vehicles, refrigerators and air-conditioners, might be located in the Industrial Free Zone, if this is established. This would facilitate the export of surplus production to other countries in the region.

If and when the Ministry finds investors for any of the items mentioned above, this project will carry out a pre-feasibility study.

D. Chemical industries

The largest single investment in this field is in the petroleum refinery. The largest number of establishments, however, are in the packaging of imported chemical products, with or without the use of any chemical process. In addition, there are two soap factories, two candle-making units and one factory each for producing industrial gases, matches, paints and pharmaceuticals.

1. Petroleum refinery

Established in 1970 at a cost of Le 5.5 million, the refinery is equipped with an atmospheric distillery and has the capacity to refine 500,000 tons of crude per year into straight-run products. Only a third of the installed capacity is being used. Capacity utilization could improve if the refinery succeeds in:

(a) Exporting its products;

(b) Diversifying its product range to replace imports;

(c) Developing the domestic market for its products.

(a) Exports. The refinery cannot market its products in the Mano River Union because Liberia has its own refinery. However, the management of the refinery, which is owned by multi-national petroleum distribution companies, cannot remain unaware of other opportunities for selling its products in any country in West Africa. Since the refinery has not so far exported its products to any of these countries, it is assumed that either the market is fully saturated or it is not in the business interest of the management of the refinery to export its products to the neighbouring countries;

(b) Product diversification. Sierra Leone at present imports lubricants, petroleum jelly and mineral wax. For the production of lubricants, a separate plant (fairly expensive) is needed and therefore the refinery cannot produce this item. The other two items (jelly and wax) are straight-run products and can be produced. The management might consider their production as this would replace imports costing around Le 0.5 million per year;

(c) Development of the domestic market. This depends upon the expansion of the capacity for thermal generation of electricity, and the establishment of energy-based industries.

Sierra Leone has now started work on the first phase of its hydro-electric project (Hydel) and this, when completed, will provide sufficient thermal capacity for several years to come.

As regards the establishment of energy-based industries, it has already been shown that fertilizer consumption does not justify production of ammonia or urea locally. The feasibility of a glass factory has been demonstrated but the Mano River Union Secretariat has sponsored this project for location in Liberia. Alusuisse has presented a proposal for establishing an alumina plant which has so far not been approved. It is understood that materials for a ceramic industry are available, but no study has so far been carried out. Thus, the prospects for a substantial increase in the consumption of refinery products in the near future are not very great.

This gives rise to the question of whether it is economically more feasible and profitable to produce refinery products locally while utilizing only 33% of the capacity of the refinery, or to import refinery products from Liberia or any other country. It is evident that both the value added and the balance-of-payment effect of this industry is marginal. But when the plant only uses 33% of its capacity, the economic and financial viability also becomes doubtful. It is therefore proposed that the management of the refinery should be requested to work out the comparative economics of the two alternatives mentioned. The management of the refinery should also assess the possibility of integrating the production and marketing of the two refineries in the Mano River Union so as to make their respective operations more economical.

2. Packaging of chemical products

Chemical products packaged locally include cosmetics, aromatics and insecticides. The industry imports both prepared products and packaging material which makes the balance-of-payment effect of this industry doubtful.

It is therefore proposed that each enterprise engaged in this industry should be asked to develop a programme designed to:

(a) Replace its packaging materials by locally-produced substitutes;

(b) Replace the import of prepared products by establishing formulation plants to prepare the products locally (even though based on imported ingredients);

(c) Replace certain imported ingredients by locally-available substitutes (petroleum jelly, white oil, fats and vegetable oils in the case of cosmetics, alcohol in the case of perfumes, and petro-vehicles in the case of insecticides);

(d) Produce such ingredients locally as is found feasible.

The programme should then be submitted to the Ministry.

3. Soap-making

Sierra Leone has two soap factories. Until recently, both were engaged in the production of laundry soap, making use of manual or semi-manual processes and using imported ingredients (vegetable oil, caustic soda, sodium silicate and packaging materials). One of the two producers recently equipped themselves with a Mazoni plant for producing both laundry and toilet soap. The other producer has now imported a part of the plant required for producing toilet soap.

An appraisal of the overall situation leads to the following conclusions:

(a) Although the size of the Sierra Leonean market does not justify the establishment of two plants for producing toilet soap, the foreign-currency position of the country does not permit an industrial plant already imported to remain idle;

(b) Local production of toilet soap is likely to become profitable only after a protective duty has been imposed on the import of this item;

(c) Export of toilet soap would be necessary if two plants are operating simultaneously;

(d) Exporting might require both union status for the industry in the Mano River Union and financial incentives over and above those at present available;

(e) Exporting will be in the interest of the country only if soap is produced from locally-available vegetable oils and fats.

These conclusions make it necessary for both the enterprises concerned to submit a well-documented case for:

(i) The imposition of a protective duty on imported toilet soap;

(ii) The provision of such incentives as may be required for export in addition to the refund of import duty paid on materials used;

(iii) The granting of Union Status in the Mano River Union (possibly in exchange for a similar facility for the detergent plant in Liberia).

The Ministry of Trade and Industry should consider these requests only when both the enterprises have started producing soap (toilet as well as laundry) from locally-available vegetable oils and fats and have guaranteed to export toilet soap to a specific value per year.

4. Candle-making

There are two enterprises engaged in this industry. The import base of this industry can be eliminated only if the refinery ensures the production and supply of mineral wax. If this has to be imported, the import of mineral wax should be licensed only against guaranteed production levels in the candle industry, verifiable on the basis of excise duty paid. If there is no excise duty on candles, this should be levied so that a relationship between import and production is established. At present, production of candles appears to be low in comparison to the amount of wax imported. It is not necessary for this industry to use imported packaging materials and licences should not be issued for these materials to this industry.

5. Safety matches

There is only one factory which produces safety matches. This was set up as a private business in the sixties but later became a subsidiary of the commercial company P.Z. (Sierra Leone) Ltd., which also owns a cold-storage plant. Since the take-over, the company has imported one or two machines for the production of inner and outer boxes as well as labelling. The plant is, however, still incomplete and is not equipped to produce the splinters or sticks which are imported. P.Z. ought, therefore, to complete the plant. It is proposed, for this purpose, that the company should first identify suitable local wood for producing sticks. The relevant expertise is available at the Forest Industries Corporation or the forestry division of the Ministry of Agriculture and Forestry. This project has already procured some information about the equipment required for this purpose from the People's Republic of China.

Product quality is also substandard and this is one reason why imported matches are competitive despite their higher price. Improvement in quality requires the replacement of some of the older machinery as well as adequate process control.

It is proposed that the company should acquire the services of an expert to prepare a plan for the modernization and completion of its plant and that this should be done within a period to be mutually agreed upon between the Ministry and the company. Unless the company improves the quality of its products and equips itself for producing sticks from locally available wood or, alternatively, from paper, the tariff protection at present enjoyed has no justification.

6. Paints

Sierra Leone has a paint factory and this was one of the units visited in November 1978. The plant is composed of a mixing mill for producing paints and a tin-can producing unit for packing the paints produced.

Paints are a mixture of pigments and diluting and drying agents such as oils, thinners, plasticizers and other vehicles. Pigments include white lead, zinc oxide, carbon black, lamp black, iron blue, chromium oxide, etc. Organic dyes are used as toners. The paint industry in Sierra Leone imports both pigments and vehicles in a prepared form. In most developing countries, paint factories are equipped with grinding mills for pigment-grinding to save foreign currency. Developing countries also produce distempers for sale in powdered form. These are diluted by the user in plain water, mostly for painting walls. The paint factory does not produce distempers in this form. They would be cheaper and would facilitate the use of distemper in areas outside Freetown. Lacquers and varnishes, for which there appears to be a sufficient market, are also not at present being produced.

This factory therefore needs both process addition and product diversification. This could be a starting point for a dialogue with the factory.

Sierra Leone is expected to become a pigment-producing country because of the availability of rutile deposits, said to be the largest in the world. It is hoped that these will be industrially utilized to the fullest extent.

7. Pharmaceuticals

This is an industry which can be greatly developed in Sierra Leone. The development of local production would be justified to replace the large present amount of imports.

A start could be made with the production, under licence, of tablets, capsules, syrups and ointments. At present, there is only one enterprise equipped with a single tabletting machine which is being used for the production under licence of a single pharmaceutical. It is proposed that other importers of pharmaceuticals might be interested in developing this industry.

E. Building materials industries

1. Cement

Sierra Leone does not have limestone and clay together in one place and is therefore not in the most advantageous position for developing a cement industry. The alternatives open to Sierra Leone are either to continue its dependence on imports or to reactivate the only plant for grinding and bagging imported clinker which at present is lying idle. The reasons why this plant is lying idle are as follows:

(a) The plant is owned by one of the largest importers of cement and as long as the import of cement is more profitable than the import of clinker for grinding, the prospects of reactivating the plant are slim;

(b) The added value in clinker grinding and cement bagging is not sufficient incentive either to the Government or to the owner of the plant to ensure its reactivation;

(c) This plant is reported to be not properly located and the cost of transporting clinkers from the ship to the plant is prohibitive;

(d) The plant is not appropriately planned. There is only one line for bagging and if this stops for any reason, clinker-grinding also necessarily comes to a halt.

Normally, in developing countries, there is a law which forbids the closing down of a plant without government permission in writing. In Sierra Leone, there is no such law and, as a consequence, factories go out of production without notifying their intention to do so.

It is proposed that a meeting with the owner of the plant be arranged to assess the prospects of reactivating it.

Mention should be made of a proposal received from MORCEM, a foreign enterprise which runs a clinker-grinding ball mill in Liberia, for establishing a new plant in Sierra Leone. This enterprise was requested to present details of this project to the Ministry.

2. Clay

Sierra Leone has a modern clay-brick factory which was planned and established by a foreign concern for the Government of Sierra Leone. The plant could not be run successfully by the original enterprise which left the country in 1977 or 1978. It is now commonly claimed that the plant is not appropriately located, is overcapitalized and ill-planned. These three aspects of the plant are discussed below to try and assess its future.

The location of the plant is not considered to be appropriate because of the lack of a clay deposit in its neighbourhood. It is normal that, prior to the establishment of a clay-brick factory, a clay deposit capable of feeding the factory over its expected life of 30 to 40 years is found. In this case, the plant was established and it was then discovered that the clay had to be transported from a deposit 40 miles away. Transportation costs made brick production uneconomic and consequently the foreign concern departed.

A search for clay deposits in the neighbourhood of the plant was then started. It was stated that geologists had found three suitable deposits of clay in Freetown. However, the new management has now confirmed that there is only one workable deposit and that this is located at a distance of eight miles and will not last beyond eighteen months. What will happen thereafter is not known.

It is proposed that another team of geologists should be asked (and, if necessary, the assistance of UNDP could be sought for this purpose) to locate suitable clay deposits all over Sierra Leone. If it is established that workable clay deposits are of small size and are dispersed all over the country, it would be appropriate to give up attempts at clay-brick production with modern technology. In that case, small-capacity periodical kilns like those popular in India and Pakistan, using a technology based on manual brick-moulding and sun-drying, would be suitable. A project of this type would not cost more than Le 50,000.

It appears that the new management took over control of the plant prior to undertaking an in-depth study of the situation. This was possible because the management was not asked to take any risk of its own. It has been allowed an annual fee for its services which is not linked to production or profit or the cost of the bricks produced. Consequently, six months after the take-over, it is still not known when commercial production of bricks will start.

It is generally agreed that the plant is overcapitalized. It was to cost Le 2 million according to the original estimates, but on completion it was found that Le 9 million had been spent. The periodical kiln installed is said to be able to contain 100,000 bricks and, if it is assumed that one charge per week is possible, the average production per day is expected to be 10,000. The investment cost of the plant, Le 9 million, if depreciated at 10%, gives a daily depreciation cost of Le 3,000 (on the basis of 300 working days a year) or Le 3 for every brick produced. This is providing the plant is run at full capacity.

The new management has now informed the Government that the bricks produced will be more expensive compared to cement blocks. This means that the plant would need a continuing subsidy to compete with cement blocks or it could operate for export which the new management has proposed.

The Government had agreed to hand over management to the present enterprise on the specific understanding that the bricks produced will be exported at a profit. Now the management has indicated that only brick facings will be exported to economise on freight costs. It is proposed that the Government should obtain a guarantee to ensure the export of brick facings at least. In any case, the Government should ask for a production and market plan for the current year, indicating monthly targets of production, local sales and exports in order to be able to judge performance.

The new management has now indicated that the kiln constructed by the previous enterprise is ill-designed and that, if the bricks are produced in this kiln, the fuel cost will be four times higher than normal. This means that either a new kiln will have to be built or this kiln will have to be modified. In both cases, the investment cost of the plant will move upwards.

It is expected that eventually the new management will come forward to say that a completely fresh look at the whole project is necessary. The issue then will be not how to reinforce a completely bad project but how to make the best use of the existing installations. This will require new studies. It is proposed that the following alternatives might be considered to give a new shape to the project:

(a) Production of high-value-added items such as clay pipes, low-temperature glazed tiles, decorative bricks, roofing tiles, red-clay pottery both glazed and unglazed, and decorative pieces of lead-glazed pottery;

(b) Re-designing of the project to make maximum use of the existing facilities for the production of bauxite or high-alumina bricks and refractories. These would be exclusively for export. There is a ready market for refractories. It is visualized that Alusuisse, which holds a lease over bauxite deposits, might in that case be ready to purchase and take over the plant.

The alternatives proposed above are for consideration only after it has been adequately established that the present project is completely unfeasible and has to be abandoned.

3. Other building materials

Sierra Leone produces other building materials such as cement blocks, pre-cast and pre-stressed building elements, terrazzo tiles, marble tiles, steel door and window frames, building elements of timber and shutter doors. It is understood that an enterprise has recently emerged for the manufacture of aluminium door and window frames.

The building elements and materials which Sierra Leone does not produce at present are numerous. The most important of the materials required is constructional steel (steel bars, sections and sizes and roofing sheets). Building elements needed include building hardware like pipes, door fittings including locks, sanitary fittings, electrical wire, electrical accessories and fittings, ceramic elements, bathroom tiles, etc. There is, therefore, considerable scope for the development of the building materials industry.

It is proposed that the Ministry of Industry should set up a committee to identify the items which could be produced and to determine an order of priority. This project will provide market and economic data to facilitate the task of the committee and will participate in discussions.

The committee should be headed by the principal industrial development officer and should include the chairman of the National Workshop, two representatives of the contruction industry and one representative each of the Ministries of Works and Mines. This committee should present its report to the Ministry of Trade and Industry within a period of two months. On the basis of the report, this project could prepare prefeasibility studies or project profiles to facilitate the selection of projects for more detailed feasibility studies and implementation. The assistance of UNIDO can be sought in producing detailed feasibility studies of the projects chosen.

F. Plastic, rubber, leather and allied industries

1. Footwear

There are two main enterprises engaged in the production of footwear. These are Plastic Manufacturing (S.L.) Ltd., and Plastic Footwear Industries.

Footwear is produced from two major components, bottoms and uppers. Sierra Leone produces material for bottoms, i.e. rubber. It is surprising that neither of the footwear enterprises use this material. These enterprises

import EVC sheets for beach sandals. Sponge-rubber sheets could be made from locally-produced rubber for beach sandals. At present, EVC waste is a problem, but if the base were changed from EVC to rubber, the waste could be recycled. Not only would Sierra Leone save a substantial amount in foreign currency but it would also produce cheaper and more comfortable beach sandals.

For the bottoms of other footwear produced by Plastic Manufacturing (S.L) Ltd., PVC is invariably used. It is possible to produce rubber soles and heels to replace the imports in this field.

No effort has been made to develop a tanning industry in Sierra Leone to produce leather for uppers. Hides and skins are at present used to make soup by poorer people because they are cheaper than meat. If a tannery were established, the price of hides and skins would reach the international level and this would enable the livestock owners and butchers to sell meat at a cheaper price. Meat is expensive because the offal is not marketable. Once industrial utilization of offal starts, a decrease in the price of meat corresponding to the sales revenue from offal can be expected.

In general, Sierra Leone has the resources to produce basic materials for the footwear industry.

Production of sponge-rubber sheets, rubber soles and heels and other rubber goods. One of the two factories, Plastic Footwear Industries, is already partially equipped for the proposed line of production. A little more machinery and the services of a rubber technologist are needed so that the production of sponge-rubber sheets as well as soles and heels for other types of footwear can start. This type of rubber technology is available in at least two African countries, Egypt and Tanzania, and two Asian countries, Pakistan and India. Technology in this field was transferred to Tanzania by Pakistan through its multinational company, Service Shoes Ltd. The following alternatives are available:

(a) Plastic Footwear Industries may advertise for an appropriately-qualified rubber technologist in the four countries mentioned to obtain the services of an experienced technologist on the most competitive terms, or

(b) They could enter into a short-term contract of collaboration with Services Shoes Ltd. of Pakistan to develop the new line of production.

Production of leather for the footwear industry. Two slaughter houses already exist in Freetown. One modern abattoir is in the process of being established. In Sierra Leone, around 50,000 cattle and 100,000 sheep and goats

are slaughtered annually. Thus, enough material is available to produce leather for the two production lines to be established, one each in the existing two factories. Both the factories are partially equipped for this purpose and some additional machinery in each factory with a conveyor would enable each factory to produce 1,000 pairs daily, which is the minimum economic unit. There are three alternatives for establishing a tannery:

(a) Bata, which has the required expertise and is managing tanneries all over the world, could be persuaded to establish a tannery capable of processing 250 hides and 500 skins per day. Bata, if agreeable, could arrange a feasibility study for such a project within a period of months;

(b) A co-operative of the tanners (there are some village-level tanning units at Kissy in Freetown), livestock owners and butchers, who at present sell the hides, could be established. UNIDO could be requested for initial assistance in planning and establishing the tannery. Alternatively, the Government could hire the services of a qualified and experienced tanner for a period of three years to initiate the development of this much-needed industry;

(c) The collaboration of Services Shoes Ltd of Pakistan would be another alternative.

Plastic shoes. The arrangements proposed above, when finalized, should provide an incentive for producing plastic shoes for export. Import licences for materials for this industry can then be linked to export earnings.

Import of footwear. The measures proposed above would enable Sierra Leone to eliminate the import of shoes. On the other hand, the export of sponge-rubber sheets and plastic shoes would become a possibility.

2. Plastic packaging

There are three main enterprises engaged in this industry:

(a) Chamrai Industries Polythene Extrusion Plant, the largest enterprise of its kind, equipped with a battery of extruders and allied machinery;

(b) BP (W.A.) Ltd., equipped with a blow-moulding machine for producing bottles for packing Whitex;

(c) Shankardas and Sons, equipped with a high-capacity extruder for producing polythene bags, a blow-moulding machine for producing bottles, and a small plastic-injection moulding machine for producing stoppers for bottles.

It seems that over-capacity for both polythene bags and bottles has been created. As soon as Shankardas goes into full production, this over-capacity will become more apparent. To avoid cut-throat competition, product diversification, specialization and market development is recommended by the expert.

It is possible to diversify the production of blow-moulding machines. In this connection, it should be said that the capacity of plastic machines is always large and the exploitation of the capacity installed depends on

moulds which are expensive and whose production is not at present possible in Sierra Leone. The firms in this industry have therefore been advised to become members of the "mould banks" operating in Europe. They should identify items of manufacture on the basis of market research and then borrow moulds for the items identified from these banks. Prospects for producing baby bottles and plastic toys such as dolls on the blow-moulding machines are promising. As regards polythese bags, it is proposed that the two enterprises involved should specialize in the production of bags of different types and thicknesses and carry out intensive research for market development. Otherwise, it will be difficult to use the installed capacity fully.

As regards injection moulding, the scope is vast. At present, rotary types of machines are being used for producing shoes. Shankardas has installed a small machine for stoppers. It is possible to diversify production to make full use of capacity. The possibility of producing plastic bodies for ball-point pens might be investigated.

There is a scope for an injection-moulding machine with an intake capacity of 14 to 16 ounces for producing plastic utensils, kitchen ware, buckets, tubs and even seats of chairs. This machine, when installed, would give a boost to plastic-goods manufacturing both for the domestic market and for export.

It is necessary to use import licensing as a lever for development in this field. Initially, import licences can be linked to production performance and, in due course, to export performance.

3. Polyurethene foam

Sierra Leone has one well-equipped modern plant for producing polyurethene foam and foam mattresses. This is yet another plant which seems to have been established before assessing the requirements of the local market. As a consequence, over-capacity has been created and it will be difficult to utilize the entire capacity for the domestic market for some years to come. The factory has also to face competition from the three spring-mattress factories in operation. These are old, well-established factories with a hold on the market. It would therefore be necessary for this factory to export its products in order to survive. This requires a study of the export market and of the need for incentives in addition to the ones available. The enterprise should be advised to undertake this study and present its report to the Government within a specified period.

Polyurethene is an expensive material to use for foam. It is understood that a number of formulations aimed at bringing down the production costs have since been developed. It is proposed that the enterprise should establish contact with a large variety of material suppliers abroad for advice and assistance.

4. Suitcases

Sierra Leone has a factory which produces suitcases and travellers' requisites of reasonable quality. Despite its competitive prices, the factory is unable to utilize its full capacity because of competing imports, the small size of the Sierra Leonean market, and their inability to produce all types of suitcases and allied products.

At the time a visit was paid in November 1978, the capacity utilization was around 65% and an attempt had been planned to achieve product diversification to improve the situation.

It is proposed that Sierra Leone might try to get Union Status in the Mano River Union for some of its existing factories. If this is accepted, the foam-manufacturing and suitcase-producing enterprises should be considered for this purpose.

It is further proposed that this factory might endeavour to produce certain new categories of high-class suitcases and brief-cases under licence. Manufacture of these products is at present entirely based on imported materials such as artificial leather, fibre, hardboard, and suitcase accessories.

5. The outlook for producing artificial leather in Sierra Leone

Artificial leather is at present being used in Sierra Leone as one of the basic materials for the production of the following items; footwear, mattresses, suitcases and furniture. The possibility of producing this material locally, therefore, looks attractive. This project could undertake a pre-feasibility study if the Ministry finds an investor interested in such a venture.

G. Paper, paper products, printing and publishing

Printing and publishing

This industry is fairly developed both in the public and private sectors. The Government Printing Press is the premier printing enterprise in the public sector. This has been recently modernized and expanded at a cost of around Le 5.5 million. It is proposed that this enterprise should be run on commercial lines and, for this purpose, a corporate structure should be established. Procurement and distribution of stationery could be separated. An industrial enterprise, if allowed to import finished products for sale as such, develops a tendency to rely on the profits of imports and shirks its responsibility to produce goods to replace the imports. This tendency can be seen in the data presented in the foregoing chapter which indicate that the value of imports is equivalent to 97% of the turnover.

As regards industry in the private sector, there are as many as ten printing presses some of which appear to be adequately equipped.

It is proposed that job specialization should be introduced by establishing a system of group consultation within the industry. This would enable each press to develop a specialized field of production.

H. Wood, wood products and furniture industries

1. Forest Industries Corporation

Forestry is a resource whose industrial potential is immense. Industrialization, however, depends largely on the exploitation of the resource. The Government of Sierra Leone, soon after independence, established a Forest Industries Corporation to achieve the twin objectives of resource exploitation and its industrial utilization.

The information from some of the annual reports of the Corporation does not, however, present a strong picture of the Corporation's performance. These reports clearly indicate that, after 15 years of its existence, the Corporation is still struggling to improve the condition of roads and transportation in order to organize its logging operations properly. As a consequence, the average annual availability of logs to the sawmill is not very great. Plans to extract and stock logs in large quantities during the

dry season do not seem to have met with much success. Thus, the installed capacity of the sawmill has remained unutilized and the Corporation has still to achieve a major breakthrough in this field.

One of the objectives for which this Corporation was established was to replace the export of logs, initially by sawn timber and, subsequently, by wood products. Little headway towards the achievement of this objective has been made or planned.

The economics of a modern sawmill depend largely on a profitable utilization of conversion waste, which is as high as 28%. There is no indication in the annual reports about the sale of this waste or its products.

The Forest Industries Corporation is the largest employer of industrial labour in Sierra Leone but when productivity per worker is computed, this gives an impression that there is over-employment.

The foregoing picture is one which emerges from the annual reports of the Corporation. It is proposed to visit the Corporation and to discuss not only the above situation but also the measures needed to improve the situation.

It is understood that expansion of the Corporation, based on a feasibility study carried out by a consultant of the Federal Republic of Germany is under consideration. It is further understood that the Government of the Federal Republic of Germany has agreed to finance this expansion.

The Corporation has also revived its request for the services of a UNIDO expert in production management.

2. Other sawmills

There are two large sawmills in the private sector. Both of these also extract their own timber and suffer from the same bottlenecks as the Forest Industries Corporation, i.e. the long rainy season, the condition of the factory-to-forest link roads, and the inadequacy of log-hauling equipment.

Some data about one of these mills is available and this indicates that capacity utilization in the private sector is better.

3. Furniture

Several enterprises of all kinds are engaged in this industry. The largest and best-known are:

The Furniture and Woodcraft Workshop of the Forest Industries Corporation at Kenema

The International Furniture Company Ltd., Freetown

E.A. Javard Modern Metal and Wood Furniture Company, Freetown

The furnishing requirements of high-, medium- and low-income groups differ from each other. Whereas design, workmanship and quality materials are the hallmarks of consumers' requirements in high-income groups, utility and price are the considerations which most affect consumers from low- and medium-income groups.

It is apparent that the three large enterprises mentioned intend to cater for the requirements of high-income groups. This brings these enterprises into direct competition with imported furniture. Consumers from high-income groups are also influenced by considerations of prestige and distinction. Thus, the local enterprises fail in their competition with the imports, despite a heavy protective duty placed on the import of furniture. These enterprises are also not competitive in the price-conscious sector of the furniture market because of their overheads. The economy market is completely in the hands of small producers.

Sierra Leone produces both furniture and upholstery materials, solid wood (teak, ebony and other high-priced varieties) springs, foam etc. The basic skills of woodwork and upholstery are also available. The role played by the defunct Railway Carriage Workshop in the development of these skills is undeniable. Thus, the potential is there, not only to replace imports, but also to build up a sizeable export of solid-wood furniture.

To achieve this, the industry might require restructuring, technical assistance for upgrading workmanship and design capabilities, and investment to facilitate modernization. Restructuring has to be planned to enable enterprises to specialize in the production of:

(a) Structural elements and components of furniture (with or without carving and inlay);

(b) Upholstery and soft-furnishing components of furniture;

(c) Standardized furniture on a mass scale for schools, hospitals, shops, housing complexes, offices, etc.;

(d) High-class furniture of excellent workmanship and design.

The Forest Industries Corporation might assume the role of leadership in the development of this industry. It is therefore proposed that a committee be established under the chairmanship of the General Manager of the Corporation to prepare a comprehensive plan for the development of this industry with the aim of eliminating imports and introducing exports as described above.

I. Light engineering and metal industries

Sierra Leone has still to initiate a programme for the development of light engineering and metal industries. In all, there are at present five enterprises (see annex I), of which the four smaller units are in the private sector. These produce respectively, springs, nails, buckets and manually-operated presses for moulding cement blocks. As in several other industries, these four industrial units suffer from over-capacity and a reluctance to utilize surplus capacity for export.

Engineering skills, particularly those required for repair and maintenance, are available. It appears that the defunct Sierra Leone railway played a pioneering role in the development of these skills.

The Government of Sierra Leone established a committee in February 1978 to assume control over the assets of the defunct railway and to manage these during the interim period. The assets taken over by this committee included a large workshop established by the railway for the maintenance of its locomotives and carriages. The Government of Sierra Leone has decided to transform this primarily maintenance enterprise into a national workshop capable of laying the foundations of an engineering industry in the country. The interim caretaker committee has been charged with the responsibility of achieving this. The services of three experts have been obtained under bilateral assistance from Hungary and placed at the disposal of the Committee.

1. National Workshop (facilities available and being used)

The caretaker committee mentioned above has succeeded in rehabilitating and reactivating the workshop. The present situation in regard to the physical assets and their use can be gauged from the most recent data supplied by the chairman of the committee in 1980 and presented below:

(a)	Area of land belonging to the workshop	10 - 15 acres
(b)	Built-up area (approximate)	20,000 square metres
(c)	Workshops in operation:	
	Repair and maintenance	Heavy-duty vehicle maintenance shop Light-duty vehicle maintenance shop Maintenance shop for Electrical appliances Plant maintenance shop
	Woodworking	Sawmills Joinery shop Upholstery shop
	Foundries	Cast-iron foundry Aluminium-casting shop
	Forging	Blacksmith shop Copper-smith shop
	Production	Sheet manufacturing shop Plate manufacturing shop
	Machine-shop and other facilities	Machine shop Millwright shop Tool room
(d)	Workshops planned and for which vacant sheds are available	Heat treatment shop Roofing-sheet corrugation shop
(e)	Items produced (excluding repair and maintenance services)	Steel doors and windows Steel furniture Buckets Aluminium pots Coal pots Modified gas cylinders
(f)	Utilizable assets of the workshop (particularly plant and machinery) as a proportion of total assets	80%
(g)	The percentage of plant, machinery and equipment which it is proposed to replace	15%
(h)	Number of persons employed:	
	Skilled workers	201
	Apprentices	58
	Trainees	18
	Unskilled workers (including watchmen etc.)	72

Drawing office	2
Storekeepers	8
Accounting	10
Security	24
Management office	22
Total workforce	415

(i) Monthly wage bill 22,000 leones

(j) Monthly turnover (average of June, July and August) 37,380 leones

2. Problems of converting a maintenance shop into a production shop

This subject was discussed with the management and, in the course of discussion, the following factors emerged as those preventing progress:

(a) The absence of a statutory, corporate, or any other legal framework suitable for commercial operation;

(b) The lack of capital for urgently-needed small improvements (replacement of leaking sheets on the roofs, addition of a continuous-welding plant etc.);

(c) The lack of working capital to facilitate the import in bulk of materials, spares and basic tools;

(d) The workforce is more geared to maintenance then to production work.

It was agreed by the management that action on (a) will be possible only after the committee formed in February 1978 has completed its assignment and presented its final report to the Government. This report is expected to include a valuation of the assets of the workshop likely to be transferred to the new body which will be created. In order to expedite the matter, it is proposed that the Ministry of Transport should be requested to fix a specific period during which the valuation of the assets of the workshop must be completed. A company or corporation must then be established to take over the assets at the value assessed and agreed to by the Government.

As regards (b) and (c), it is proposed that the present caretaker committee should be authorized to dispose of such assets as are of little use to the workshop at present or in the foreseeable future and to use the proceeds of these assets to meet its working-capital and small-investment requirements for the interim period. In this connection, it should be added that the development budget for the current year also contains a sizeable allocation for investment. The other alternative for the Ministry of Transport would be

to guarantee a loan of around Le 200,000 to be released by the Sierra Leone Commercial Bank. In any case, an urgent solution to this problem has to be found to enable the workshop to move forward.

Regarding (d), this appears to be a most serious problem. The management plans to overcome this by linking wages to production performance. It is doubtful whether this will bring about a change in the attitude of workers. It is hoped that, with the recruitment of new workers, the problem will decrease. It would be advisable to use the old workers in the maintenance department of the Workshop.

3. Growth and development prospects of the National Workshop

The physical assets of the workshop include both vacant land and land built up with sheds, stores and offices. It has been estimated that the total area owned by the workshop is 15 acres or so and that the built-up part is very roughly estimated to be not more than 20,000 square metres or 5 acres (including in-plant roads and other essential facilities). If these estimates are correct, almost 10 acres of open land are at present unused. The following proposals have been drawn up and presented for consideration.

(a) The establishment of a small industries estate for light-engineering industries. It is proposed that, in the first instance, a complete survey of the land belonging to the Workshop should be carried out and, if it is correct that the land not in use is approximately 10 acres, then the proposal to establish a small industries estate for light-engineering industries on the vacant land should be evaluated. Assuming that 33% of the land is required for utilities and facilities, six to seven acres of land (25,000 square metres) should be available for factory plots on the proposed 10-acre estate. The land required for a small factory varies from 1,000 to 2,000 square metres. Thus, the small industries estate, if established on the vacant land of 10 acres, would offer fully-developed plots for 10 to 15 factories.

The investment data presented in chapter II indicates that private enterprise has the capacity to generate funds for investment in three to five factories per year. Based on this, it is visualized that the colonization of the proposed estate would take five to seven years. It normally takes 18 to 24 months to establish a small enterprise.

To form a rough preliminary estimate of the investment needed for the project, the following items of costs have been identified:

(i) A pre-investment study to establish the feasibility of the estate, indicating the industries to be promoted, the formulation of each project and giving an assessment of their feasibility;

(ii) The creation of physical facilities and amenities, roads, drainage, water supply, electric installations, telephone, post office, cafetaria etc.;

(iii) Investment, in local and foreign currency, for the establishment of 10 to 15 factories for the production of selected products.

Investment on (i) and (ii) is roughly estimated to be Le 1 million and, if a feasible project is prepared, it should be possible to interest some aid-giving countries or agencies to meet this cost by making a grant. It is proposed that the factory plots thus developed should be sold at cost and this would generate adequate funds for the expansion and modernization of the National Workshop.

It would be advisable to chose those items for manufacture in the estate factories for which the Workshop could provide common services such as heat treatment and electroplating, tooling and design facilities. Thus the Workshop and the light-engineering factories on the estate could be made interdependent to the extent commercially and technically feasible.

To develop the estate and to equip the National Workshop to provide adequate technical services, a loan in foreign currency of Le 5 million will be needed. It is visualized that, subject to the feasibility of the project, it should be possible to ensure financing through the International Development Association (IDA), the African Development Bank (AfDB) or the European Economic Community (EEC).

UNIDO is already providing assistance with planning the proposed estate in collaboration with this project. After the feasibility study is ready, the action required to seek funds for (ii) and (iii) above could be initiated. The executing agency for this plan could be a semi-autonomous subsidiary of the National Workshop;

(b) Modernization and expansion of the National Workshop. The National Workshop at present performs the following distinct activities:

(i) Repair and maintenance of plant, vehicles, heavy-duty transport and other equipment as well as electrical appliances;

(ii) Production of engineering goods to order;

(iii) Serial production of other engineering goods.

A look at annex I, part 2 indicates that the repair and maintenance facilities offered by private enterprise for light-vehicles and for electrical appliances are more than adequate. Thus, it would be advisable for the National Workshop to disassociate itself gradually from activity in this field and to leave this field to the private sector. It is understood that private enterprise does not at present offer repair and maintenance facilities for plant and machinery or for heavy-duty transport equipment. The National Workshop has therefore a monopoly in this field which can be fully exploited.

The National Workshop has still to identify suitable items for serial production in its manufacturing shops. Production of tractor trailers, wheelbarrows, storage tanks, silos and even insecticide-spray equipment, with or without collaboration, could be considered. All these items are required for rural and agricultural development. The National Workshop is at present organized as an integrated workshop composed of foundry, machine shop, millwright shop etc. In this case, each shop has to be dependent on the activity of the others. To keep all the shops simultaneously busy, synchronization of activity in the production of one or more items in all the shops is necessary. To keep each shop busy, it seems necessary to chose heavy-engineering products and to adjust the capacity of each shop for that purpose, but the market for

heavy-engineering goods is so limited that identifying promising items for production will be difficult. As regards light-engineering products such as sewing machines, water pumps (centrifugal), electric fans and electric motors, not only is the market too small to justify commercial production, but it would also be a problem to balance the capacity of different shops within a viable production programme;

(c) Conversion of the National Workshop into a complex of light-engineering industries. This is an option which, if adopted, would require a complete and thorough re-organization of the Workshop. This alternative was discussed with the management. It was proposed that the Workshop should chose one of the following fields for planning its future production programmes;

(i) Building materials industries;

(ii) Transport equipment and spares;

(iii) Consumer goods industries;

(iv) Agricultural implements.

The management thought that prospects in the field of (i) would be promising. The following products in this field are proposed for prospect-assessment studies:

Roofing sheets, corrugated and galvanized
Pipe and pipe fittings
Steel bars, (deformed or others) angle iron, tee iron and strip from imported billets or re-rollable scrap
Building hardware (steel doors and windows, wire gauze, door fittings, door locks, sanitary fittings etc.)
Electric wire and cables (for domestic use only)
Lighting appliances and fittings
Electrical accessories (domestic use only)

Once the suitability of an item for local manufacture is proved, a separate self-contained factory for that item should be established which would operate as an autonomous subsidiary of the National Workshop.

To conclude, the following options are available if the National Workshop is to play an effective role in the development of light-engineering industries in Sierra Leone;

(i) Simultaneous action on (a) and (b);

(ii) Simultaneous action on (a) and (c);

(iii) Action on (c) alone.

J. Textile industries and products

Textile production, in general, is negligible. It is limited to handloom cloth and Gara printing in the traditional sector, and to ready-made garments, knitted fabrics and knitwear in the modern sector. It is the latter which is briefly reviewed in the paragraphs that follow.

1. Ready-made garments

The domestic market for ready-made garments in developing countries is normally limited because of the abundance of inexpensive tailoring facilities and the preference for garments traditional in that culture. Sierra Leone is not an exception to this rule.

A ready-made garment industry is usually developed either to produce for export or to make uniforms for the police and the army. Enterprises established to produce for export have to be equipped with appropriate design facilities and the most modern plants capable of producing a quality acceptable to the export market. In Sierra Leone, there is only one enterprise which fulfils these requirements. The design and production facilities installed in this enterprise are superb. The factory employs imported skills for designing and for production supervision.

The enterprise is equipped for export but has given up its efforts in this field due to procedural bottlenecks. The enterprise obtained certain export orders on the basis of cloth supplied by the customers abroad, but the consignment was held up at the customs for a long time due to the absence of procedures relating to imports for conversion and re-export. When the goods produced were sent back, the proceeds were held up for months because of a lack of understanding of the difference between the export of goods and the conversion value added to the imported cloth. As a result of these difficulties, the enterprise suspended exports.

It is therefore suggested that the Ministry of Trade and Industry, in collaboration with UNDP and the GATT/UNCTAD International Trade Centre project, should carry out a study of the problems of this company and try to find solutions to them in order to enable the company to produce wholly or mainly for export.

The domestic market for locally-produced garments is limited not only for the reasons stated above but also because of the import of ready-made garments. It is proposed that the situation be reviewed and that imports be restricted to the minimum by using both tariff and non-tariff barriers.

The other garment factory is more suited for the production of uniforms for the police and the army. At present, both garment factories compete for

orders from this source and, as a consequence, the capacity utilization and profitability of both enterprises suffer. It would therefore be better for the first company to specialize in production for export and the limited civilian market in Sierra Leone for ready-made garments. The second enterprise could develop itself into a clothing factory for the police and the army.

2. Knitting

Sierra Leone has one knitting mill. This enterprise is heavily hit by competition from imported goods as the quality of its products is below that of many imported articles. Poor production performance also tends to make its products expensive. This, then, is a factory which needs special attention from the Ministry. The Ministry has to devise measures to protect this pioneering endeavour against imports, but this enterprise has also to improve its quality, diversify its product range and reduce its production costs in order to survive.

If the enterprise is responsive, the Ministry might arrange discussions to draw up a concrete programme for the development of this industry. It would seem that prospects for the development of this industry are much more promising than those of the ready-made garment industry. However, the assessment of development and growth prospects requires co-operation between the Ministry and the enterprise.

3. Prospects for the growth of the textile industry

Prospects for the development of the textile industry (spinning, weaving and finishing) have been fully investigated.

FAO made an initial study of the prospects for cotton cultivation and the results of this study indicate that, despite difficulties, prospects in certain areas of Sierra Leone are promising. In most countries it is possible to cultivate cotton where sugar cane is grown. Another study has already identified possible sugar-growing areas in Sierra Leone. It is therefore proposed that the Ministry of Agriculture should be requested to develop a specific project for cotton cultivation on an experimental basis.

UNIDO has, at the request of the Mano River Union Secretariat, carried out two studies to establish the feasibility of locating an integrated cotton and polyester-blend textile Mill in Sierra Leone and a plant for the production of synthetic fabrics in Liberia.

It is proposed that action on the implementation of the first of these projects should be speeded up. If the Ministry agrees, the Investment co-operative Programme of UNIDO could be requested to find foreign investors for this project. This plant, if established, could produce 20 million yards of cloth annually, sufficient to meet local requirements.

K. Miscellaneous industries

1. Cartridge assembly

There is one company in this field and it is equipped with a single rotary machine to assemble cartridges from imported materials. These include pruned casings, washers of leather-board or wax-board including top-card washers, lead shot of different sizes and gun powder.

It is surprising that the factory also imports inner boxes made of flexible board. Only label printing is done locally and the block for that was imported although there is a known block-making enterprise in Freetown. It is proposed that the import of inner boxes should be discontinued.

As regards components, the management should be asked to produce washers from imported wax-board locally. The National Workshop can supply a manually-operated puncher for this purpose. The National Workshop can also investigate whether lead balls for cartridges can be produced locally. The two plastic packaging concerns in Sierra Leone should examine the possibility of producing pruned casings. Alternatively, the cartridge company should import a machine for [illegible]ding plastic or board casing locally. Casings can be produced from eit[illegible]aterial.

2. Mirror polishing

There is a small unit engaged in silvering and polishing imported glass sheets of varying thicknesses.

The only materials required for producing mirrors are glass sheets and silver nitrate. It is not possible to replace the import of either of these two materials. What is required to improve the economics of this industry is:

(a) An appraisal of the comperative costs in local and foreign currency of imported and locally-produced mirrors in three different thicknesses. If it is found advantageous to produce mirrors locally, the import of mirrors of all kinds could be stopped. This would provide a market for the growth of this industry;

(b) An exploration of the prospects for producing mirror frames locally. If it is found worthwhile, the mirror-polishing enterprise could take this up as an additional venture. Frames are produced from metal, wood and plastic materials and the frames thus produced can also be used for photographs;

(c) An assessment of the possibility of using the glass waste from this factory, plus that from the commercial importers, as well as broken glass recovered from garbage, for remelting and conversion into pressed-glass products.

It is understood that the enterprise is considering the proposal at (c) already.

L. Concluding remarks

A relatively stagnant state of affairs has come to prevail in the field of industrial development in Sierra Leone and one cause for this lies in the nature of the present industries leading to their relatively poor performance.

This being the case, it is of paramount importance that consolidation and strengthening of the existing industrial structure should receive a very high priority in all future plans for industrialization.

Consolidation calls for the sort of analysis of the situation, industry by industry and enterprise by enterprise, which has been presented in the foregoing paragraphs. Admittedly, this analysis had to be based on the inadequate data that was available. Nevertheless, all possible efforts were made to supplement this data from other sources such as visits to factories and discussions with management wherever possible. This analysis has provided the outline of a programme for the consolidation and development of each individual industry and enterprise.

It is proposed, therefore, that a copy of the programme outlined for each industry and enterprise should be sent to them. It is visualized that a considered response will enable the Ministry to finalize a programme for the consolidation and strengthening of the existing industrial base and this in turn will reactivate the industrial sector and open new avenues for its growth and development.

V. THE ROLE OF FOREIGN INVESTMENT IN INDUSTRIAL DEVELOPMENT

A. Foreign investment to date

1. Attracting investment

Foreign investment has played a crucial role in stimulating the process of industrialization in most developing countries and Sierra Leone is not an exception to this. Sierra Leone offers incentives and facilities to attract foreign investment and this outward-looking policy followed in the past has paid dividends.

Foreign investment is hard to get and expensive to repay and this makes the choice of industrial projects of paramount importance. Up to now, the foreign investor has enjoyed complete freedom of choice in all matters relating to the selection, evaluation, implementation and operation of industrial projects. Experience indicates that this freedom has not yielded the best results. Industrial projects of marginal value to the national economy have sprung up and projects have been established whose installed capacity cannot be fully used. It is necessary to correct this situation and, for that purpose, to identify the factors which make a project simultaneously beneficial to the foreign investor and to the national economy.

(a) Interests of foreign investors. The primary interest of a foreign investor lies in the use of the market, material, or human resources of a developing country. A foreign investor normally invests in projects which offer him either:

(i) An expansion of his export business to a new or existing market for his products, expertise and technology, or;

(ii) A supply of processed materials for his enterprises elsewhere on relatively favourable terms;

(b) Interest of Sierra Leone. The primary interest of Sierra Leone lies in the value added and the balance-of-payment effect of the industrial operations planned. It is also of interest to Sierra Leone that goods produced are competitive both in quality and price with similar imported items. Value added and balance-of-payment effect vary from project to project. It is the amount of added value and foreign-exchange earnings or savings which should determine the decision to implement a project.

2. Evaluation of industrial projects

It is obvious that, unless Sierra Leone has the capacity to evaluate industrial projects prior to approving their implementation, the industrial

enterprises established with foreign investment will continue to be planned so as to suit the interests of the foreign investors. The absence of a project-evaluation capacity may result in accumulating foreign-currency liabilities and may inhibit the optimum industrial utilization of resources.

It would be possible for Sierra Leone in the near future to develop a capacity to identify industrial projects suited to foreign investors, but the capacity to undertake feasibility studies of industrial projects has to remain a long-term objective. To be realistic, for several years to come it will be necessary to use foreign firms of industrial consultants to carry out feasibility studies of selected industrial projects. The services of UNIDO could also be used.

It is, however, possible and desireable for Sierra Leone to streamline procedures for selecting consulting firms of the required competency and impartiality and to control the cost. It is proposed that the Ministry should maintain a register of foreign firms of industrial consultants and invite offers for each feasibility study from the consultants on that register. This international tender would bring down the consultancy costs and would enable Sierra Leone to chose consulting firms whose impartiality is beyond doubt. It is envisaged that the Industrial Planning Section to be established in the Ministry will be equipped with the expertise to do this. This project will be in a position to develop and make available standardized procedures and forms for this purpose, if required. It should be mentioned that, in the annual development budget, there is invariably an allocation for feasibility studies. To reduce, and eventually dispense with, dependence on foreign consulting firms, Sierra Leone should encourage the establishment of national firms of industrial consultants, initially in co-operation with foreign firms.

The Industrial Planning Section must also be trained and equipped to evaluate the feasibility studies carried out by foreign consulting firms. In the present circumstances, this service is urgently needed to ensure that foreign investment is used for industrial projects which are viable and useful to the national economy. Some examples of the indiscriminate use of foreign investment are given later. It is assumed that the measures proposed, if adopted, will go a long way to correct the situation.

3. Investment in industry by expatriate communities settled in Sierra Leone

The main architects of Sierra Leone's small to medium industry were the expatriate communities settled in this country during the colonial era. These communities had commercial and entrepreneurial experience and were well equipped to assume the role of leadership. Thus, they performed a pioneering role.

Many of these entrepreneurs are naturalized citizens of Sierra Leone but it is the attitude and not the legal status which matters. Expatriate industrialists invariably employ personnel of their respective communities in all administrative and managerial positions. Secondly, entrepreneurs emerging from these communities have not always taken into consideration the national interests of Sierra Leone in selecting and planning industrial projects. Consequently, import-based, low-value-added industries have been established. The sole criterion seems to have been a quick return on investment, a typical attitude of the trader-cum-shopkeeper.

The investment made by these communities is neither quite foreign nor local. It is local in so far as the capital invested was formed locally. It is foreign in that the attitude in the matter of industrial planning and employment is similar to that of foreigners.

4. Some examples of an inappropriate use of foreign investment

Freedom to choose industrial projects for investment and to choose the location for industrial enterprises has resulted in the emergence of:

(a) A large number of small enterprises owned by foreign investors;

(b) Industrial enterprises based on capital-intensive technology, low value added and imported inputs;

(c) The concentration of industry in and around Freetown.

Some examples of such foreign investment are:

(a) One multinational company has made investments in small establishments for packing imported whitex, producing blow-moulded plastic bottles, and converting imported wax into candles;

(b) Another multinational has established a facility to stamp imported EVC sponge sheets into beach sandals and to produce PVC injected footwear;

(c) Another firm mills American wheat, unmindful of its responsibility to promote the cultivation of wheat locally, which experts have already assessed as feasible.

Some examples of investment by the expatriate communities will also be of interest. These are:

Grinding imported solar salt

Bottling wines, edible oil, cosmetics, aromatics and insecticides, all imported in prepared forms

Extrusion of polythene for producing bags

Semi-boiled laundry soap

Producing consumer packs of toilet rolls from imported tissue.

Further types of industry based on foreign investment can be found in the list of industrial enterprises which were awarded development certificates which entitle a company to tax exemption and other facilities.

5. Legal requirements

So far as is known to the expert, there is no law in Sierra Leone which requires local participation in industrial investment, nor is there any law which requires registration of foreign investment in industry. Thus, information about the source and amount of foreign investment is not available. Similarly, there is no law which imposes a ceiling on the amount of profit which can be repatriated. It is true that repatriation is subject to the foreign-currency regulations of the Bank of Sierra Leone, but the regulations required to facilitate capital formation for reinvestment in industry are absent.

6. Sources of foreign investment for industrial development

These are as follows:

(a) Multinational companies and private foreign enterprises other than multinationals;

(b) Multinational and national financing institutions in the capital-exporting countries;

(c) Suppliers' credits;

(d) Grants and loans offered by friendly countries for specific industrial projects.

The bulk of foreign investment in Sierra Leonean industry is from the sources (a), (b) and (c). Industrial projects are presented by the sources at

(a) together with a financing plan covering (b) and (c). Normally, the equity to be held by the promoter is minimal and the amount of loan is higher. This is because of the absence of any regulation of the debt-equity ratio. It is primarily for the purpose of tax exemption that projects are presented to the Ministry with a financing plan.

The Bank of Sierra Leone guarantees the repayment of foreign loans with interest and is therefore expected to maintain a record of foreign loans guaranteed.

The National Development Bank has recently started acquiring equity in new industrial projects and this trend, if pursued, will be helpful to the Government in acquiring information control over the activities of the foreign investors in the industrial sector.

It is necessary for the Ministry to maintain a complete record of foreign investment in industry. This will become possible after the new Development of Industries Act is passed which makes approval necessary for all industrial projects.

As regards (d), this source of foreign investment is used mostly for industrial projects in the public sector.

B. Proposed investment policy

The Development of Industries Act, which outlines an investment policy for the industrial sector, will enable the Ministry to channel foreign investments towards industries and areas of national priority in accordance with that investment policy. It will also require the Ministry to authorize only such projects as are found, on evaluation, to have a positive balance-of-payment effect, value added above 30%, an adequate capacity to repay loan, and a reasonable rate of discounted return on investment. This law will also control the employment of expatriate personnel.

It is feared that these restrictions, though necessary, might prove counter-productive in discouraging foreign investment. This fear was expressed in the meetings of the committee formed to evaluate the draft of the Development of Industries Act.

To prevent this happening, it is proposed that alternative options might be designed to offer foreign investors freedom to chose industries for investment, the location of plants and expatriate personnel for management. It would be necessary, however, that any alternative system should serve the national priorities as enunciated in the Development of Industries Act. Secondly, the proposed system should take into account the existing procedures and traditions. Keeping all these factors in mind, it is proposed that the Government of Sierra Leone should consider the possibilities of establishing an Industrial Free Zone (like the one in Liberia) and of introducing a scheme for foreign investment in industry on a "pay-as-you-earn" basis. The main features of these two schemes are outlined below.

1. The Industrial Free Zone

It is proposed that an Industrial Free Zone (IFZ) should be established in Sierra Leone to achieve the following objectives:

(a) The industrial processing of exportable materials produced in the country;

(b) An optimum use of the cheap labour supply and geographical location of the country;

(c) An unrestricted flow of technology for industrial development.

Industrial development in the IFZ will not be regulated by the Development of Industries Act. The economics of the zone itself will direct investment to the right channels and limit imports and expatriate employment.

The IFZ has to function as an autonomous entity. The success of such a venture is dependent on the deployment of a watchful customs agency and coast guard. The location of the IFZ will be of paramount importance. It could function successfully in a clearly demarcated area where natural bounderies are an obstacle to smuggling. Sierra Leone has 10 islands and some of these might have some sort of harbour facilities to accommodate the proposed IFZ.

The question of whether the proposed IFZ should also include trade should be considered. There is, at present, an unrestricted inflow and outflow of commodities from and to neighbouring countries. For instance, livestock from Guinea is brought into Sierra Leone for sale and imported goods move out from Sierra Leone in exchange. The issue that has to be considered is how far the proposed IFZ can prove effective in disciplining the present inter-country trade to the advantage of Sierra Leone's economy. It may be more feasible to have a separate trading free zone in the border areas.

There are clearly possibilities for transit trade. A look at the foreign-trade statistics of Sierra Leone indicates that goods are imported into Sierra Leone for re-export in smaller packs to the neighbouring countries. Such a transit trade, if disciplined and channeled through the IFZ, could emerge as an important earner of foreign currency.

2. The establishment of industrial enterprises by foreign investors on a "pay-as-you-earn" basis

Sierra Leone is in a position to offer yet another option to those foreign investors who require freedom of action in all matters relating to the composition of investment (with or without the participation of local capital), employment of expatriates, import of plant, machinery, equipment, materials and spare parts, and the export of industrial goods produced. All these facilities can be offered providing the foreign investor is prepared to establish an industrial enterprise on a pay-as-you-earn basis. In this case, the foreign investor would be free to invest in an industry of his choice and to establish that industry anywhere he likes in Sierra Leone.

A foreign investor in such a case will be permitted (subject to his project being approved) to open an external account. The rules of such an account are already well-defined in Sierra Leone. In broad terms, these are as follows:

(a) The holder of an external account in a Bank in Sierra Leone cannot simultaneously open and operate an internal account in his own name, or in the name of any establishment in which he has the slightest interest, or under a fictitious name;

(b) The holder of an external account shall not participate in any economic activity outside the one authorized;

(c) The external account and the assets associated with that account in Sierra Leone shall be liable for confiscation in the event of the use of any channel other than the external account for the in- and outflow of capital from and to Sierra Leone.

It is obvious that this option can only be available in the case of exporting industries. The economics of such a venture are obviously beneficial to the local economy. There will be no import liability. All expenses incurred locally (for the purchase of materials, hiring of personnel etc.) will be payable only from the external account, i.e. in hard currency.

The two proposals mentioned in the foregoing paragraphs will require a detailed feasibility study after the Ministry has given its assent in principle. UNIDO could be requested to provide a short-term expert for such a study in collaboration with this project.

3. Kind of foreign investment needed for resource-based industries

Private foreign investment is seldom available for industries which require simultaneous investment in the development of local resources and in the industry based on those resources. The size of investment required for agro-industrial complexes, fishery complexes, industrial projects based on minerals or forestry produce is always very large. The gestation period is long and return on investment during the initial years negligible and sometimes negative.

Although, in the case of minerals, fisheries and forestry, foreign investors are anxious to acquire long-term leases on the natural endowments of developing countries, they are rarely willing to plan and invest for the industrial utilization of the yield from the concessions thus acquired.

A developing country could refuse to grant concessions without receiving a commitment to promote industrial utilization. This is not always practicable or possible. As a consequence, Sierra Leone has not followed this course and has already leased its mineral, forestry and fishery resources to foreign companies. However, in most of the concessions granted, the Government of Sierra Leone holds the controlling share and is therefore in a position to require the renegotiation of the terms to ensure the industrial utilization of the produce.

It is understood that the foreign company which holds a bauxite lease has already presented a project for an alumina plant. No decision seems to have been taken so far. Delay in such matters, unless there are tangible reasons, is not in the best interests of the national economy. Other alternatives could be explored. For instance, if the aluminium plant is too expensive and energy-consuming, a start could be made by producing bauxite bricks.

Another multinational firm might also agree to create a facility for the industrial processing of rutile pigment prior to export.

It seems doubtful whether those foreign concerns who hold forestry and fishery concessions would agree to renegotiate their terms.

To utilize agricultural resources, bilateral assistance (such as that provided by the People's Republic of China for the sugar complex) has to be obtained. This is needed for the second sugar mill, the textile mill, the rubber industry, the production of cocoa butter, instant coffee and gingerine, wheat, palm and coconut exploitation etc. It is proposed that friendly countries be approached in this matter. If required, this project could produce project profiles in respect of each product to facilitate initial contacts with friendly countries on the subject.

4. Terms on which foreign investment should be considered outside the free zone and the pay-as-you-earn scheme

It is necessary to discipline the flow of foreign investment outside the free zone and the proposed reserved areas of industrial development for export-oriented and resource-based industries. Investment in all such cases should be permitted only with local participation on the basis of joint-venture agreements (to be approved by the Ministry) and subject to the conditions outlined in the draft law. All projects presented for this purpose must be subjected to stringent appraisal. Employment of expatriates in all such projects should be restricted on the basis of the provisions set out in the draft of the Development of Industries Act.

Since capital is in short supply, it is necessary to make investment attractive by offering the incentives and safeguards against nationalization already proposed in the act.

Local participation may initially, for a specified period, be limited to 49% to permit foreign investors to control management. The proposed restrictions on the employment of foreigners will gradually make the foreign management dependent on local executives and technicians. After the agreed period, the equity held locally could be increased to permit the transfer of control over the management to local people.

VI. PUBLIC INVESTMENT IN SIERRA LEONEAN INDUSTRY

1. Ownership of industrial enterprises in the public sector

During the colonial era, organizations such as the Sierra Leone Produce Marketing Board, the Forest Industries Corporation and the Rice Corporation were established as statutory bodies. The industrialization process which started soon after independence necessitated the expansion of the public sector and, as a consequence, a sizeable corporate structure built up by public funds has emerged. The Ministries of Government (such as Information, Works, Agriculture, Natural Resources, Transport and Communications and Social Welfare) also established industrial enterprises and are at present engaged in their management. There are now as many as 44 industrial enterprises created wholly or partly with public funds. (For details see annex III). There is no one single institution or agency which co-ordinates industrial activity in the public sector. Each corporation (statutory body), or company (registered under the Company Law of Sierra Leone), or Ministry of Government manages its own industrial activity independently. Consequently, there is no unified direction to guide the performance and growth of individual enterprises in the public sector.

2. Source of public funds for investment in public-sector industries

Public funds for investment in industry come both from external and internal sources. All foreign loans are made to and received by the Ministry of Finance for investment in a project specified by the lending country or institution. Suppliers' credit becomes available after repayment is guaranteed by the Government.

As regards funds in local currency, these come from the following sources:

The Ministry of Finance

The Bank of Sierra Leone

The Sierra Leone Commercial Bank

The National Development Bank (NDB)

The Sierra Leone Produce Marketing Board (SLPMB) and other public corporations or companies established with public funds

The National Development Bank, although constituted as a public company with limited liability, is the only public-sector financial institution authorized under its charter to participate in the equity of public-sector industrial enterprises.

Similarly, two statutory public corporations, SLPMB and the Forest Industries Corporation (FIC), are authorized under their respective charters to make investments in industry.

It is proposed that, in future, all public funds for investment in industry should be channelled through the aforementioned three agencies. While the two corporations will be required to invest in industries covered by their rerpective charters, the National Development Bank can be nominated as the sole agent of Government for investing in industries other than those covered by the two corporations.

It is further proposed that the public funds already invested in the companies which run public-sector industrial enterprises should also be taken over by the National Development Bank as its equity, under arrangements to be negotiated with the Ministry of Finance.

Public funds, whether these originate from internal or external sources, should be provided by the Government, through the Ministry of Finance, Bank of Sierra Leone or the Sierra Leone Commerical Bank, as loans to the National Development Bank for investment in specific projects in the public sector. These will be approved from time to time by the project-approval committee which will become operative as and when the new Development of Industries Act comes into force. The National Development Bank should also have the authority to disinvest public funds wherever this seems profitable or desireable.

No record of public funds so far invested in industry is available. Nor is there an inventory of the physical assets created as a result of the investment of public funds. The National Development Bank should be made responsible for collecting and collating this information and publishing it periodically.

3. Definition of the public sector and the scope of public investment

The expansion of the public sector is not a political requirement in Sierra Leone. This makes it possible to define the public sector and to determine

the scope of its activity solely on the basis of economic considerations. If the proposal presented in the foregoing paragraph is accepted, the definition of the public sector should be as follows:

> "The public sector in industry includes statutory public corporations, authorized by their respective charters to make investments in industry, and industrial companies registered under the Company Law of Sierra Leone in which the National Development Bank holds a controlling share of the equity."

The charters of the two corporations, SLPMB and FIC, adequately define the scope of their respective activities. It is proposed that the scope of the financing activity of the National Development Bank should also be specified on the following basis:

(a) Nature of industry. It is imperative that the public sector should not disperse its resources over too wide a field and should restrict the scope of its activity to as few industries as possible. It is proposed that discussions should be held to finalize a list of specific industries suitable for the investment of public funds by the National Development Bank. This list should then be released for the information of private enterprise in particular and the public in general;

(b) Size of industry. It is proposed that public funds should not be invested in small industrial enterprises. It is, therefore, suggested that investment of public funds should be restricted to enterprises whose investment costs exceed Le 2.5 million or who employ 250 or more employees;

(c) Location. It is further proposed that public-sector investment should be mainly used for developing industry in areas outside Freetown though exceptions can be made in special cases.

4. The objectives of public-sector investment

It is advisable to define the objectives of public-sector activity in the field of industrial development. This will prove helpful in the finalization of the list of industries to be chosen under (a) in the foregoing paragraph.

The following objectives are proposed for discussion by the committee which is to be formed for this purpose in the Ministry of Trade and Industry:

(a) To reduce the export of raw materials prior to processing. It is proposed that the next National Development Plan should fix specific targets for the three holding agencies (SLPMB, FIC and NDB) for the replacement of the export of raw materials by industrially-processed products. The Ministry of Trade and Industry should check progress towards these targets through periodical performance evaluation;

(b) To promote domestic production of agricultural and industrial inputs (such as fertilizers and insecticides), intermediates (sawn timber, pulp, etc.) spares, accessories and simple equipment (agricultural tools);

(c) To develop local professional skills in both the managerial and technological fields;

(d) To fulfil the basic requirements of the local population for processed food, building materials, cotton and synthetic fabrics pharmaceuticals and educational supplies.

Needless to say, the overall objective of the public sector should be the integration of industrial activity with the development of the primary sectors of the economy.

5. Organizational structure

The foregoing proposals would create a three-tier organizational structure for public-sector industry as shown below:

Organization	Function
Ministry of Trade and Industry	Industrial planning Project approval Performance evaluation
Holding agencies (NDB, SLPMB and FIC)	Project formulation Project evaluation Investment planning Company formation Management control
Public companies (one to be established for each approved project)	Project execution Project management

It is necessary for the holding agencies to operate as the headquarters of their respective public companies and to provide common services. It is likewise necessary for them to develop and exercise suitable management controls. These may include budgetary, inventory and cost controls. Each holding agency will have to establish a separate department for supervising the performance of its subsidiary companies.

The Ministry of Trade and Industry, on the other hand, should prescribe a standard format for performance evaluation on the basis of the one already designed for this purpose.

The Ministry has also agreed to establish a separate section for public-sector industrial companies and projects to deal with their respective problems in relation to the Government and its Ministries.

6. Industrial management

It is proposed that a uniform system of industrial management and of accounting be developed for all the public-sector industrial enterprises. If this proposal is accepted, UNIDO could be requested to provide the services of a management expert to design a management system, accounting framework and management controls.

To put the management system and controls thus devised into operation, it will be necessary for the consultant to provide for the training of staff at different levels in each company and holding agency. It may be necessary to send key personnel for training abroad.

It is reported that an Institute of Industrial Management is in the process of being established in Freetown. It is proposed that, as and when the institute is established, the facilities there should be fully utilized for the development of management skills in the public sector.

It is also proposed that each holding agency should convene a monthly meeting of plant managers to exchange professional experience and work out solutions to the day-to-day managerial problems. The holding agency should take a note of any problems requiring its assistance.

7. Project development

The holding agencies will be able to rely on the following secondary sources in looking for suitable new industrial projects and projects for the vertical or horizontal expansion of existing enterprises:

(a) Studies already carried out by consultants and experts deputed by aid-giving countries and agencies to determine existing and potential resources available for industrial utilization in various primary sectors of the economy (an abstract of these reports has been prepared by this project and will be released);

(b) Feasibility studies carried out by UNIDO and other agencies for the Mano River Union on specific industrial projects;

(c) The list of industries whose prospects have been found promising given in the National Development Plan;

(d) Studies being carried out by this project and presented in the form of reports;

(e) Proposals received from the foreign suppliers of industrial technology and equipment;

(f) Studies which will be carried out by the Industrial Planning Section being established in the Ministry of Trade and Industry;

(g) Proposals formulated by the existing public-sector companies for their respective growth and development.

It should not, therefore, be necessary for a holding agency to expend its resources on project-identification studies.

It is proposed that each holding agency should maintain a portfolio of industrial-project profiles with priority ratings to show interested foreign investors. Alternatively, project-formulation and -evaluation formats issued by the Ministry (already proposed as a part of the draft law) can be used for presenting projects for approval.

8. Concluding remarks

It is proposed that government Ministries should be relieved of the responsibility for operating industrial plants and that bureaucratic management should be replaced by professionally-trained industrial management.

It is proposed that public funds should not be invested in industry directly by the Ministry of Finance nor through a large number of ministries, directorates, agencies and companies. All investment of public funds should be made through a limited number of holding agencies which (excepting the National Development Bank) should be statutory corporations each with specific responsibility for the development of one well-defined sub-sector of industry.

Each holding agency would be authorized to establish a subsidiary company registered in Sierra Leone for each individual industrial plant.

The function of the holding agency will be to oversee the industrial managers who, in turn, will manage the industrial plants.

The Ministry of Trade and Industry would be primarily responsible for industrial planning but the projects may be prepared at the level of the holding agencies.

Each industrial company may initiate programmes for the growth and development of its plant, but each project will need the approval of the Ministry.

The Ministry will be responsible for co-ordinating public-sector activity in the field of industrial development.

VII. TOOLS OF INDUSTRIAL DEVELOPMENT

1. The industrial infrastructure

The promotion and development of industry presupposes the existance of a legal, physical and institutional infrastructure. The Development of Industries Act will provide the initial legal infrastructure and will make it a statutory responsibility of the Ministry of Trade and Industry to create the physical and institutional infrastructure. The Ministry is being re-organized to be able to implement the various provisions of the proposed law.

2. National Development Plan

The National Development Plan provides the outline of a programme for the industrial sector. It is the responsibility of the Ministry of Trade and Industry to see that this programme is implemented.

The Ministry of Development and Economic Planning controls and supervises the implementation process through its annual development programmes and the development budget for projects in the public sector.

The industrial development programme is composed of:

(a) Proposals for offering tariff protection and other incentives to industry and for the expansion of the industrial infrastructure facilities mentioned above;

(b) Projects to be implemented in the public and private sectors.

As regards (a), the plan's directives are expected to be implemented largely through the Development of Industries Act, when it comes into force. Tariff protection can only be based on case studies of individual enterprises or industries. This is a complex issue involving the conflicting interests of consumers, importers, industrialists and revenue departments of the Government. Normally, a commission or committee is established to hold public enquiries and to make concrete recommendations to the Government on that basis. In Sierra Leone, the establishment of such a commission is not feasible on account of the shortage of personnel. This leaves the Ministry of Trade and Industry with two alternatives. Either it can investigate each individual request for tariff protection and make recommendations on the merits of each case to the appropriate government authority, or it could adopt a system of non-tariff barriers instead of tariff barriers to ensure a domestic market for locally-manufactured products.

As regards the public sector mentioned under (b) above, it is proposed that the Ministry of Development should issue a directive to all public-sector industrial projects to present their requests for funds from the development budget through the Ministry of Trade and Industry. Thus, the Ministry of Trade and Industry will be responsible for the formulation of the development budget for the industrial sector as well as for the supervision of the allocation and utilization of the funds allocated in the budget.

As regards the private sector mentioned under (b), the Ministry of Trade and Industry has the power and facilities to use the non-tariff barriers mentioned above to achieve its objectives.

3. Tools of development

The Ministry of Trade and Industry is therefore equipped, or will be equipped, with the following tools whose judicious use will accelerate the pace of industrial development:

(a) The Development of Industries Act;

(b) The development budget for the industrial sector;

(c) Non-tariff barriers which can be imposed through the foreign trade policy to be formulated and followed by the Ministry.

This is not the place to discuss (a) as a comprehensive law has already been drafted by the expert and presented to the Ministry. It has been discussed in a committee formed by the Government and its summary has been approved by the Cabinet. Thus, the Ministry is soon expected to be equipped with a well-defined industrial policy, strategy and the powers required to accelerate the pace of industrial development.

As regards (b) and (c), these are discussed in the paragraphs that follow.

4. The development budget

A separate, comprehensive paper has been produced on this subject which has been forwarded by the Ministry of Trade and Industry to the Ministry of Development. This paper, among other things, presents the following conclusions:

(a) Since the Ministry of Trade and Industry was not the executing agency for most industrial projects, participation by the Ministry in the formulation of the development budget has in the past been marginal;

(b) Allocations made in the development budget for industrial projects either under or outside the control of the Ministry, were seldom used. Some projects contacted (i.e. the National Workshop) indicated that funds allocated never actually became available;

(c) The development budget is meaningful where funds from external sources are available. Projects based exclusively or mainly on internal resources are usually in need of further funding;

(d) The managements of most industrial projects do not seem keen to apply for allocations in the development budget or to subject their respective operations to budgetary discipline which requires quarterly progress reporting;

(e) The development budget has come to be an exercise in figures. Project-execution targets are not laid down or related to budgetary allocations for subsequent evaluation;

(f) There seems to be a misunderstanding in the minds of certain officials that allocations in the budget can be sought and used only for the creation of fixed assets, and that project-execution costs (salaries of project-execution personnel) are not chargeable to the development budget;

(g) There is also no system for obtaining project-completion reports so that completed projects can be transferred to the revenue budget or, in the case of certain commercial or industrial projects, allowed to operate on their own.

These conclusions are based on the study of the situation prevailing in the industrial sector. Things could be different in other sectors of the economy. The following proposals were made in the aforesaid paper for improving the situation in the industrial sector:

(a) The Ministry of Trade and Industry should have a central role in the formulation of the annual development budget for the entire industrial sector and should make use of the budget as an effective tool of development planning;

(b) For this purpose, the Ministry of Trade and Industry should convene an annual meeting of the managers of industrial projects being implemented as well as of the new projects approved for execution in the public sector to discuss the problems they face and to identify the factors which are inhibiting progress. The funds and measures needed for the removal of the bottlenecks should be determined to ensure that projects are implemented in the shortest possible period at the minimum cost.

In short, the Ministry should use the development budget as an effective tool of achieving its goals of industrialization in the public sector.

5. Non-tariff barriers

The formulation and execution of the foreign trade policy is the primary responsibility of the Ministry of Trade and Industry. It is, therefore, evident that the Ministry has the powers to use non-tariff barriers for industrial development.

The Development of Industries Act, when it comes into force, will make it a statutory concern of the Ministry to:

(a) Re-design and reshape the import policy hitherto followed;

(b) Introduce a system of industrial licensing.

The purpose of (a), as stated in the draft law, is to achieve:

(i) A gradual and systematic transfer of the import of commercial items from foreign and expatriate enterprises to Sierra Leonean enterprises;

(ii) The diversion of foreign and expatriate capital from trade to industry by making industry more attractive and profitable as compared to trade.

The purpose of (b) is to link the import of industrial inputs with production performance, domestic production of certain industrial inputs, and export performance. The outline of a programme for achieving these objectives has been given in chapter IV.

It is visualized that each enterprise will formulate its own plan for reducing its import liability by investment in the domestic production of certain inputs and for exporting production surplus to the requirements of Sierra Leone.

In the case of exports, the proposals might include restrictions or a complete ban on imports to enable an enterprise to sell its products abroad at the most competitive prices and to recoup the loss, if any, by selling products at a comparatively higher price in the local market.

It is evident that the system proposed will require the evaluation in depth of each proposal received, and must be based on guaranteed exports and retail sale prices in the local market. Thus, if import policy is to be production-, development- and export-oriented, it will be necessary to grant an Open General Licence only for essential commodities, and those only provided they are not also being produced locally.

Annex I

UNIVERSE OF MODERN FACTORY-TYPE INDUSTRY IN SIERRA LEONE IN 1970[a/]

Abbreviations and symbols used in the annex

Sources of information

Ministry of Labour	L
Ministry of Trade and Industry	T
Ministry of Development and Economic Planning	P
Estimate based on the average of industry group or technical estimate	G

Employment-size groups

Above 500 employees	A
251 - 500	B
101 - 250	C
51 - 100	D
50 or less	E

Organizations

Sierra Leone Produce Marketing Board	SLPMB
Forest Industries Corporation	FIC
Ministry of Social Welfare and Rural Development	MSW
Ministry of Natural Resources	MNR
Ministry of Agriculture and Forestry	MAF
National Workshop	NW

Pipeline projects are projects under implementation or in an advanced stage of planning.

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a/ Certain statistical data may be from other years in the nineteen seventies.

1. Food, beverages and tobacco

Industry sub-group		Industrial establishment (name and address)	Number of employees	Source of information	Employment-size group
Fish freezing, processing and canning	1	Sierra Fishing Co. Ltd, PB 1142, Freetown formed after merger of:	70	G and L	D
		(a) Sierra Leone Shrimp Export Ltd 36L (b) Fish Industries Ltd. 18L (c) Van Camp Ltd. (d) Sea Products Ltd. (e) Joint Venture Fishing Enterprise Ltd.			
		Cold storage, 11 000 cu ft and ice factory at Kissy Dockyard			
	2	Okay Agencies (SL) Ltd Cold Storage, Goderich, Freetown	20	G	E
	3	Maryland Fishing Company (cold storage) Government Wharf, Freetown	20	G	E
	4	Leone Fishing Company Ltd, Murray Town (cold storage)	20	G	E
	5	Marine Development Company Ltd	20	G	E
	6	Sierra Leone Joint Stock Company Ltd, Murray Town (ice factory)	20	G	E
		Subtotal	170		
		Registered Fishing Trawlers 70 USSR catch January - June 1978 40,000 tons			
Meat production	7	City Council Abattoir, Freetown	44	L	E
	8	Pig and Poultry Processing Plant, Kissy (Ministry of Natural Resources)	32	L	E
	9	Sausages Plant (owned by Freetown Cold Storage)	20	G	E
	10	Slaughter House, Kissy (public sector)	20	G	E
	11	Dr. Sittar Slaughter House, Bokal (including poultry freezing plant)	19	L	E
	12	Meat Production Plant, Njala University	20	G	E
	13	Poultry Hatchery, Freetown (capacity 6,000 eggs) (Ministry of Natural Resources)	20	G	E
		Subtotal	175		
		Pipeline projects: two modern slaughter houses at Freetown and Makeni			
Milk production	14	Fan Milk Reconstitution Plant	Closed down		
Poultry and animal feed	15	Feed Mill Products Ltd, Kissy Dockyard	21	T and L	E
	16	Saeed Endrodge Feed Mills, Kissy Dockyard	15	G	E
	17	Feed Mill, Njala University	15		E
		Subtotal	51		
		Pipeline project: Fish-meal plant of Integrated Fish-Meal Industries Limited			
Wheat milling, wheat and flour products	18	Seaboard West Africa Flour Mills Ltd	85	T and L	D
	19	Alosak Ltd, 5 Dixon Street, Freetown (bakery)	55	L	D
	20	Kamal Jahzmi Bakery, 24 Race Course Road	30	L	E
	21	Jamil Nasser Cotton Tree Bakery	20	L	E
	22	New Italian Bakery (reported to be closed)	26	L	E
		Subtotal	216		
Rice mills	23	Rice Mill, Kissy (capacity 1.5 tons per hour)	47	L	E
	24	Rice Mill No. 2, Kissy (capacity 1.5 tons per hour)	47	L	E
	25	Rice Mill, Mambolo (capacity 1 ton per hour)	52	L	D
	26	Rice Mill, Torma Bum (capacity 1 ton per hour)	45	L	E
	27	Rice Mill, Kenema (owned by S.B. Nyandemoh)	30	L	E
		Subtotal	221		

owned by SLPMB

Industry sub-group		Industrial establishment (name and address	Number of employees	Source of information	Employment-size group
Edible-oil mills	28	Palm Kernel Oil Mill, Wellington Estate (SLPMB) (capacity 10,000 tons per year)	290	L	D
	29	SLPMB Oil Mills, Bacoma, Southern Province	25	L	E
	30	SLPMB Oil Mills, Njala, Southern Province	25	L	E
	31	SLPMB Oil Mills, Sahn Malen, Southern Province	25	L	E
	32	SLPMB Oil Mills, Talu, Southern Province	25	L	E
	33	SLPMB Oil Mills, Kangba, Southern Province	34	L	E
	34	SLPMB Oil Mills, Masanki, Southern Province	25	L	E
	35	SLPMB Oil Mills, Wanjei, Southern Province	25	L	E
	36	Pioneer Oil Mills, Mangeh Bureh, Northern Province (SLPMB)	31	L	E
	37	Palm Oil Mills Ltd, Daru (MAF)(capacity 10,000 tons per year)	27	G	E
	38	Palm Oil Mills Ltd, Gambia Mattru, Bonthe District (MAF) (capacity 10,000 tons per year)	27	G	E
	39	J. Matar and Co. Ltd, oil mills at Bo (capacity 5,080 tons per year of 250 days)	27	G	E
	40	MOBAI Palm Oil Mills Ltd (capacity 2,100 tons per year)	27	G	E
		Subtotal	621		
		Pipeline project: SLPMB edible-oil refinery			
Baby food	41	Bennimix Baby Food Plant, Sewa Road, Bo. (MSW)	53	L	D
Salt	42	Salt Manufacturing (SL) Co Ltd, Kissy Dockyard	65	L and T	E
	43	Osman Thomas Salt Project	120	G	C
		Subtotal	185		
Coffee grinding	44	J. Jabbar and Son, Freetown	6	L	E
Cold storages (other than those attached to fisheries and abbatoirs)	45	Freetown Cold Storage Ltd (Capacity 10,000 cu ft)	20	L	E
	46	United Africa Company Ltd (capacity 5,700 cu ft)	10	G	E
	47	P.Z. Cold Storage (capacity 4,000 cu ft)	10	G	E
	48	Cold Storage, Kenema (capacity 1,500 cu ft)	10	G	E
	49	Cold Storage, Bo(capacity not known)	10	G	E
		Subtotal	60		
Fruit canning	50	Dutch Fruit Canning Factory Ltd (in participation with Government)	60	G	D
Beverages, alcoholic and non-alcoholic	51	Sierra Leone Brewery Ltd, Wellington Estate	389	L and T	B
	52	Wellington Distillery, Wellington Estate	47	L and T	E
	53	Shankardas and Sons, Kissy Dockyard (bottling plant)	30	L	E
	54	Sierra Leone Bottlers (Choithrem), 136 Kissy Road	30	L	E
	55	Freetown Cold Storage Ltd, Brookfields (Coco Cola plant)	160	L and P	E
	56	Sierra Leone Enterprises Ltd, Kingtown (Pepsi Cola plant)	98	L and P	D
		Subtotal	754		
Ice cream	57	Dutch Ice Cream Factory (closed)	60	G	E
Biscuits and confectionary	58	National Confectionary Ltd (NATCO), Wellington Estate	137	L and T	C
Tobacco	59	Aureol Tobacco Co. Ltd, Wellington Estate	309	L and T	B
		Total	3 012		

Abstract

Total industrial establishments	59
In operation	56
Pipeline projects	3
Establishments registered under the Factories Act	35
Public-sector enterprises	25
Private-sector enterprises	34
Employees in public sector	1 137
Employees in private sector	1 875
Total number of employees	3 012

Enterprises in employment-size group:

A	Nil
B	3
C	2
D	8
E	45
	58

2. Repair and service workshops

Industry sub-group		Industrial establishment (name and address)	Number of employees	Source of information	Employment-size-group
Automobile repair and service workshops	1	Workshop managed by Directorate of Road Transport Department	524	L	A
	2	Workshop managed by Road Transport Corporation	420	L	B
	3	Société Commerciale De Louset African, 27 Blackball Road, Freetown	120	L	C
	4	Allgemeine Bau Union GmbH, Fisher Lane, Freetown	100	L	D
	5	Sierra Leone Enterprises, Kingtom	87	L	D
	6	Workshop managed by Ports Authority at Queen Elizabeth II Quay	81	L	D
	7	Workshop managed by Police Force at Kingtom Barracks, Freetown	69	L	D
	8	United Africa Motors Ltd, Cline Town	65	L	D
	9	Assad Yazbeck and Sons Ltd, Blackball Road	50	L	E
	10	Bruno Motors Repair and Service Shop, 11 Kennedy Street, Freetown	48	L	E
	11	Raymond Garage, 54 Wilkinson Road, Freetown	45	L	E
	12	African Commercial and Agricultural Enterprises, Lightfoot Boston Street	39	L	E
	13	Baydoun and Abbas, 38 Bye Pass Road, Kissy Dockyard, Freetown	38	L	E
	14	John Michaels Motor, Passonage Street, Kissy	34	L	E
	15	CFAO Motors Ltd, Charlotte Street, Freetown	45	T	E
	16	Ahmad Toufic and Sons, 16 Wilkinson Road	26	L	E
	17	Y.K. Koroma, 7 Africanus Road, Freetown	25	L	E
	18	Freetown Motors Ltd, 80 Wilkinson Road	23	L and T	E
	19	Sierra Motors Ltd, 33 Wilkinson Road	23	L	E
	20	Mohammad Chandon, 44 Kissy Road	21	L	E
	21	Datsun Motor Vehicles Co. Cline Town, Freetown	20	L	E
		Subtotal	1,797		
Repair and service workshops for electrical equipment	22	Werner Chrutes Ltd, 12 Murray Town Road	30	L	E
	23	Air Cold Engineering Co. Ltd, Howe Street	25	L	E
	24	Electro Technical Ltd, 31 Siaka Stevens Street	15	L	E
		Subtotal	70		
Repair and service workshops for tractors and agricultural equipment	25	Workshop managed by Ministry of Agriculture	101	L	C
	26	UAC Motors Ltd, 8 Blackball Road, Freetown	60	L	D
		Subtotal	161		
Repair of typewriters and calculating machines	27	Brechbuldt and Co Ltd, 5 Wilberforce Street	22	L	E
	28	NCR Ltd, 26 Walpole Street, Freetown	19	L	E
		Subtotal	41		
Marine craft repair and service facilities	29	Workshop managed by the Sierra Leone Ports Authority, Cline Town	600	L	C
General repair workshop	30	Workshop managed by Ministry of Works	400	L	B
Repairs of wireless equipment	31	Workshop managed by the Sierra Leone Electricity Corporation, Lightfoot Boston Street	27	L	E
Repair of bank equipment	32	Workshop managed by Bank of Sierra Leone	25	L	E
		Total	2,721		

Abstract

Number of Workshops	32	Enterprises in employment-size group:	
Pipeline projects	nil		
Establishments registered under Factories Act	32	A	1
		B	2
Public-sector enterprises	9	C	3
Private-sector enterprises	23	D	5
Employees in public sector	1,847	E	21
Employees in private sector	874		32
Total number of employees	2,721		
Number of employees in automobile workshops	1,797		
Enterprises in employment-size group:			

3. Chemicals (excluding plastics and vegetable oil) petroleum, and refinery products

Industry sub-group		Industrial establishment (name and address)	Number of employees	Source of information	Employment-size group
Packaging of chemical products	1	A.J. Seward (packer of perfume and toiletries)	27	T	E
	2	Venice Perfumeries and Cosmetics Ltd., 42 Kissy Bye Pass Road	20	L	E
	3	Khalil E. Bahsoon, 9 Little East Street	15	L	E
	4	Sierra Cosmetics, 7 Kelsey Rd, Kissy Dockyard	11	L	E
	5	Aerosol Filling Co. (air fresheners, insecticides)	20	O	E
	6	Cosmetic Pharmaceutical Co. Ltd., (pomades and perfumes) 9 Little East St, Freetown (sister concern of 3 above)	32	D	E
	7	Whitex Ltd. (packers of Whitex)	—		
		Subtotal (estimate on the basis of average employment of 4 out of 7 factories)	143		
Soap manufacturing	8	Chanrai Chemicals Ltd., Wellington Industrial Estate	79	L and P	D
	9	Washex Soap Co., Wellington Industrial Estate	67	L and P	D
		Subtotal	146		
Candle making	10	Oriental Candle Factory, 6 Murray Town Rd	18	L and P	E
	11	BP Candle Factory, Wellington Industrial Estate	11	L	E
		Subtotal	29		
Petroleum refining	12	Petroleum Refining Co. Ltd, Kissy Dockyard	127	L and P	C
Industrial gases	13	Sierra Leone Oxygen Factory Ltd., 32 Horse Shoe Rd, Kissy Dockyard	47	L and P	E
Matches	14	Sierra Leone Match Industries Ltd., Wellington Industrial Estate (subsidiary of P.Z. (Sierra Leone) Ltd.)	32	L and P	E
Paints	15	Sierra Leone Paint Manufacturing Ltd., Wellington Industrial Estate	40	L and P	E
Pharmaceuticals	16	Sterling Products International Ltd., 121A Wilkinson Road, Freetown	28	L and P	E
		Total	592		

Abstract

Number of establishments	16
Pipeline projects	nil
Factories registered under the Factories Act	16
Establishments with government participation	1
Establishments in the private sector	15
Number of employees of the joint venture	127
Number of employees in private sector	465
Total number of employees	592

Enterprises in employment-size group:

A	Nil
B	Nil
C	1
D	2
E	13
	16

4. Building materials industries

Industry sub-group		Industrial establishment (name and address)	Number of employees	Source of information	Employment-size group
Cement	1	Sierra Leone Cement Works Ltd. (plant lying closed)	Closed	-	-
Bricks	2	Sierra Leone Clay Bricks Industries Ltd., Kissy	495	P	B
Tiles	3	Marble Tile Co. Ltd., Wilkinson Road	12	P and L	E
	4	Terrazzo Tiles Co. Ltd.	16	L	E
		Subtotal	28		
Cement blocks	5	L. Construction Co. Ltd., 104 Wilkinson Road Freetown	20	L	E
Pre-cast building elements and pre-stressed beams	6	R.A. Claudius Cole, 8D Ac[illegible] Town, Freetown	15	L	E
	7	Standard Pre-cast Concrete [illegible]. Ltd.	26	L	E
	8	Urban Planning and Building Material Co. Ltd., 79-B Wilkinson Road Freetown	100	L	D
	9	Alu Allgemeine Bau Union, Fisher Lane Road	30	L	E
	10	S.L.C.C. Centrix Ltd., 124-107 Wilkinson Road	42	L	E
		Subtotal	213		
Metal frames for doors and windows	11	J. Mather and Co., 44 Dembara Road, Bo.	80	L	D
	12	J. Mather and Co., Fisher Lane, Kissy	120	L	C
	13	Sierra Leone Metal Products Ltd., 4 Bolling Street Freetown	33	L	E
	14	Jamil Alani Metal Works, 28 Bye Pass Road, Kissy	14	L	E
	15	Adenor Metal Works, 5 Bell Street, Freetown	20	L	E
	16	Mann's Metal Works, Freetown	14	L	E
		Subtotal	281		
		Total	1,037		

Abstract

Number of establishments	16
In operation	15
Pipeline projects	Nil
Public-sector enterprises	1
Private-sector enterprises	15
Number of employees in public sector	495
Number of employees in private sector	542
Total number of employees	1 037

Enterprises in employment-size group:

A	Nil
B	1
C	2
D	2
E	11
	15

5. Paper, paper products, printing and publishing

Industry sub-group		Industrial establishment (name and address)	Number of employees	Source of information	Employment-size group
Printing and publishing enterprises	1	Sierra Leone Government Printing Press, Freetown	435	L and P	B
	2	Provincial Printing Press, Bo	24	G	E
	3	Provincial Printing Press, Kenema	24	G	E
	4	Provincial Printing Press, Makeni	24	G	E
	5	Daily Mail Press, Rawdon Street, Freetown	150	L	C
	6	Commercial Printers Co. Ltd, 7 Brookfields Motor Road, Freetown	81	L	D
	7	Atlantic Printers, 2 Walpole St, Freetown	65	L	D
	8	Associated Printing Press Ltd., 46 Bathurst Street, Freetown	50	L	E
	9	M.E. Macaulay Commercial Printers, 68B Bye Pars Road, Kissy	36	L	E
	10	New Era Printing Press, 67 Siaka Stevens Street, Freetown	17	L	E
	11	Fourah Bay College Printing Press, Freetown	13	L	E
	12	Oduntor Printing Press, 61 Soldier Street	10	L	E
	13	Michael Mourice Printing Works, Freetown	24	G	E
	14	Joshua Printers, Freetown	24	G	E
	15	Bumumbo Printing Press, Bo	24	G	E
		Subtotal	1,001		
Packaging industry	16	UNIPAC (United Paper Company), Freetown	16	L	E
		Total	1,017		

Abstract

Number of establishments	16
Pipeline projects	nil
Establishments registered under Factories Act	9
Public-sector enterprises	5
Private-sector enterprises	12
Employees in the public sector	657
Employees in the private sector	360
Total number of employees (estimate)	1,017

Enterprises in employment-size group:

A	Nil
B	
C	-
D	2
E	12
	16

6. Wood, wood products and furniture

Industry sub-group		Industrial establishment (name and address)	Number of employees	Source of information	Employment-size group
Furniture	1	International Furniture Co Ltd, New Road, Allen Town (out of production)	60	L	D
	2	H.A. Jaward Modern Metal and Wood Furniture Co., 5 Betts Street, Cline Town	56	L	D
	3	Road and Co., Juba Estate	45	L	E
	4	Gentrie Ltd, 124-107 Wilkinson Road	42	L	E
	5	Falkenberg and Braun, 20 Smart Farm Road	25	L	E
	6	Freetown Furniture Factory, 90 Campbell St.	23	L	E
	7	Sierra Leone Wood and Furniture Workshop, 4 Charlotte Street, Freetown	15	L	E
	8	Giacomo Vitale, 63 D Smart Farm Road, Freetown	15	L	E
	9	Furniture and Wood Craft Workshop (Forest Industries Corporation), Kenema	34	C	E
		Subtotal	315		
Sawmills	10	Forest Industries Corporation, Kenema	824	P	A
	11	Panguma Saw Mills Ltd., Kenema District	158	T	C
	12	Sierra Leone Timber Industrial and Plantation Co.	143	L	C
		Subtotal	1,125		

Boat-building industry	13	Boat-building Yard (owned and managed by the Ministry of Natural Resources)	22	L	E
		Total	1,468		

Abstract		Enterprises in employment-size group:	
Number of establishments	13	A	1
In production	12	B	Nil
Pipeline projects (expansion of existing units)	2	C	2
		D	2
Establishments registered under Factories Act	12	E	8
			13
Public-sector enterprises	3		
Private-sector enterprises	10		
Employees in public sector (estimate)	880		
Employees in private sector	582		
Total number of employees	1,468		

8. Light engineering and metal products (excluding building hardware and repair workshops)

Industry sub-group		Industrial establishment (name and address)	Number of employees	Source of information	Employment-size group
Casting, forging machining and fabrication	1	National Workshop, Cline Town	250	L	C
Beds and springs	2	Metal Beds and Springs Manufacturing Co., Kissy Dockyard	43	L	E
Buckets and trunks	3	Metal Ware Manufacturing Co., Wellington Industrial Estate	40	L	E
Wire products	4	Sierra Leone Nail Manufacturing Co. Ltd., 7 Wellington Road, Freetown	20	L and T	E
Metal blocks for printing industry	5	Metal and Block Making Factory, 24 Hennessy Road, Kingtom	25	L	E
		Total	378		

Abstract		Enterprises in employment-size group:	
Number of establishments	5	A	nil
Pipeline projects	nil	B	nil
Factories registered under the Factories Act	5	C	1
Enterprises in public sector	1	D	nil
Enterprises in private sector	4	E	4
Employees in public sector	250		5
Employees private sector	128		
Total numb. of employees	378		

7. Plastic, rubber, leather and allied products

Industry sub-group		Industrial establishment (name and address)	Number of employees	Source of information	Employment-size group
Footwear	1	Plastic Manufacturing (S.L.) Ltd., Bata Buildings, Wallace Johnson Street, Freetown	70	L	D
	2	Plastic Foodwear Industries, Wellington Estate	56	L	D
	3	West African Shoe and Rubber Industry	64	L	D
		Subtotal	190		
Foam mattresses	4	Foam Manufacturing Co. Ltd., Wellington Estate, Freetown	30	P	E
Plastic packaging	5	Chanrai Industries Polythene Extrusion Plant (project under expansion)	10	P	E
	6	Plastic Manufacturing Afro-Plast, 21 Wharf Road, Cline Town	30	L	E

	6	Plastic manufacturing Afro-Plast, 21 Wharf Road, Cline Town	30	L	E
	7	Shankadas and Sons (project under implementation	30	L	E
	8	[illegible] (W.A.) Ltd., blow moulding plant	30	L	E
	9	Khalil Bahsoon Plastic Bottles	21	L	E
	10	A. Brunschweiller and Company Ltd., Freetown	14	L and L	E
		Subtotal	135		
Suitcases	11	Sierra Leone Suitcase Works Ltd., Kissy Dockyard	50	L	L
Rubber-tyre retreading	12	Renew Tyres Ltd.	14	L	E
		Total	419		

Abstract

Total number of establishments	12	Enterprises in employment-size group:	
Pipeline projects	nil	A	nil
Public Sector Enterprises	nil	B	nil
Total number of employees	419	C	nil
		D	3
		E	9

9. Textiles and textile products

Industry sub-group		Industrial establishment (name and address)	Number of employees	Source of information	Employment-size group
Knitting and knitwear	1	Sierra Leone Knitting Mills Ltd.	59	P	E
Garments	2	Sierra Industrial Vestment Co. Ltd. (SIVCO), 69 Wilkinson Road, Freetown	75	P	D
	3	Syenu Boutique and Tailoring Enterprise, Goderich Street, Freetown	75	L	D
		Subtotal	150		
Jute products	4	Jute Products Company, Kissy	300		B
		Total	509		

Abstract

Number of establishment	4	Enterprises in employment-size group:	
Pipeline projects	1	A	nil
Establishments registered under Factories Act	3	B	1
		C	nil
Public-sector enterprises	nil	D	2
Total number of employees	509	E	1
			4

10. Miscellaneous industries

Industry sub-group		Industrial establishment (name and address)	Number of employees	Source of information	Employment-size group
Mattresses	1	Osman Thomas and Sons, 135 Wilkinson Road	13	L	E
	2	Ahmad Alie Jaward and Sons, 4 Sackville St, 19 Kissy Street, P.O. Box 475, Freetown	13	L	E
	3	Khalil Bahsoon, 9 Little East Street	6	L	E
		Subtotal	32		
Laundries	4	Padamba Laundry Ltd., 37 Percival Street	50	L	E
	5	Modern Laundry and Dry Cleaning, Garrison Street	20	L	E
		Subtotal	70		
Diamond cutting and polishing	6	Sierra Leone Diamonds, 25 Pultney Street	60	L	D
Cartridge assembly	7	Sierra Leone Explosives Ltd., Freetown	12	T	E
Mirror polishing	8	Phillip Boulos, Wilkinson Road, Freetown	6	L	E
		Total	180		

Abstract

Number of establishments	8
Pipeline projects	nil
Establishments registered under Factories Act	8
Public-sector enterprises	nil
Total number of employees	180

Enterprises in employment-size group:

A	nil
B	nil
C	nil
D	1
E	7
	8

Annex II

LIST OF ESTABLISHMENTS SUPPLYING DATA
TO THE MINISTRY OF DEVELOPMENT

1. National Confectionery Ltd. (NATCO)
2. Seaboard West Africa Flour Mills Ltd.
3. Feed Mill
4. Fish Industries Ltd.
5. Salt Manufacturing (SL) Ltd.
6. Palm Kernel Oil Mill
7. Sierra Leone Brewery Ltd.
8. Sierra Leone Enterprises Ltd.
9. Wellington Distillery
10. Freetown Cold Storage Ltd.
11. Aureol Tobacco Co. Ltd.
12. Metal Beds and Springs Manufacturing Co.
13. Sierra Leone Clay Bricks Industries Ltd.
14. Sierra Leone Knitting Mills Ltd.
15. Sierra Industrial Vestment Co. Ltd. (SIVCO)
16. UNIPAC (United Paper Company)
17. Daily Mail Press
18. Sierra Leone Suitcase Works Ltd.
19. Sierra Leone Government Printing Press
20. Forest Industries Corporation
21. Foam Manufacturing Co. Ltd.
22. Oriental Candle Factory
23. Sierra Leone Paint Manufacturing Ltd.
24. Sierra Leone Oxygen Factory Ltd.
25. Sierra Leone Match Industries Ltd.
26. Chanrai Industries Polythene Extrusion Plant
27. Petroleum Refining Co. Ltd
28. Plastic Manufacturing (S.L.) Ltd.
29. Washex Soap Co.
30. Sierra Leone Timber Industrial and Plantation Co.
31. Pangumr Saw Mills Ltd.

32. Cosmetic Pharmaceutical Co. Ltd.
33. Sierra Leone Explosives Ltd.
34. Metal Ware Manufacturing Co.
35. Gambia Mattru Palm Oil Mills Ltd.
36. Sierra Leone Diamonds

Annex III

INDUSTRIAL ENTERPRISES IN THE PUBLIC SECTOR

Public-sector ownership of industry is vested in Sierra Leone in:

(a) Statutory public corporations;

(b) Ministries, institutions and agencies of Government;

(c) Companies formed and registered in Sierra Leone with or without foreign participation.

(a) Industrial enterprises owned by statutory public corporations

Forest Industries Corporation owns a forestry complex composed of logging operations, sawmills, furniture factory and handicraft shops. Projects in the pipeline include expansion of the sawmills and the establishment of a joinery shop.

The Board of Management of the National Workshop has assumed the management of the locomotive and carriage shops of the defunct Sierra Leone Railway. The National Workshop is a complex of engineering, electrical and wood-working industries.

The Sierra Leone Produce Marketing Board is active in the fields of agriculture-based industries. The enterprises owned and managed by the Board are:

Palm Kernel Oil Mill, Freetown
Pioneer Oil Mills at Mangeh Bureh, Northern Province
Seven Palm-oil mills, one each at Bacma, Njala, Sahn Malen, Telu, Kangha Masanki and Wanje all in the Southern Province
Four rice mills, two in Freetown and one each at Mambolo and Torma Bum

The SLPMB has a pipeline project for an edible-oil refinery

The Road Transport Corporation owns a large-size repair and service workshop.

The Ports Authority owns an automobile repair and service workshop and a marine craft repair and service workshop.

The Sierra Leone Electricity Corporation (SLEC) owns a workshop for the repair and maintenance of wireless equipment.

(b) Industrial enterprises owned by Ministeries and institutions of Government

The Ministry of Natural Resources has a pilot plant for pig and poultry processing, a poultry plant (capacity 6,000 eggs) and a boat-building yard. Pipeline projects include two modern slaughter houses of which one is at Makeni and the other at Freetown.

The Ministry of Agriculture owns and manages a workshop for the maintenance of agricultural machinery including tractors. Projects in the pipeline include sugar mills.

The Ministry of Social Welfare owns the Bennimix Baby Food Plant at Bo.

The Ministry of Information owns the Government Printing Press.

The Ministry of Works owns a workshop for the maintenance of construction machinery.

The Directorate of Road Transport owns a workshop for the maintenance of the transport fleet.

The police force owns a workshop for the maintenance of its transport.

The Bank of Sierra Leone owns a workshop for the maintenance of its equipment.

Njala University owns one meal-production plant and one feed mill.

The Freetown City Council manages two slaughter houses of which one is at Kissy.

(c) Companies established wholly or partly with public investment

Sierra Leone Clay Bricks Industries Ltd., Freetown

Palm Oil Mills Ltd., Daru

Palm Oil Mills Ltd., Gasbia Mattru

Mabole Fruit Company Ltd.

Petroleum Refining Co. Ltd.

Daily Mail Press

Wellington Distillery

Annex IV

INVESTMENT DATA

	Name of establishment	Investment (leone)	Reporting year	Number of employees	Employment-size group	Investment per worker (leone)
1	Sierra Leone Brewery Ltd.	12 390 000	1978	389	B	31 850
2	Aureol Tobacco Co. Ltd.	7 648 000	1976/77	309	B	24 750
3	Petroleum Refining Co. Ltd	5 519 000	1976/77	127	C	43 457
4	Pangum Saw Mills Ltd.	3 848 000	1978	158	C	24 354
5	Seaboard West Africa Flour Mills Ltd.	3 150 000	1978	85	D	37 066
6	Palm Kernel Oil Mill	2 800 000	1977	300	B	9 333
7	National Confectionery Ltd. (NATCO)	2 480 000	1978	137	C	18 109
8	Chanrai Chemicals Ltd.	2 000 000	1976/77	79	D	25 316
9	Sierra Leone Clay Bricks Industries Ltd	2 000 000	1976/77	495	B	4 040
10	Forest Industries Corporation	1 957 510	1976	858	A	2 281
11	Sierra Leone Government Printing Press	1 319 000	1975/76	435	B	3 032
12	Wellington Distillery	840 000	1976	47	E	17 872
13	Sierra Leone Oxygen Factory Ltd	440 000	1976/77	47	E	9 447
14	Poem Manufacturing Co. Ltd	378 831	1977	30	E	12 626
15	Sierra Leone Enterprises Ltd (7-Up)	300 000	1978	98	D	3 060
16	Freetown Cold Storage Ltd (Coca Cola)	284 000	1976/77	160	C	1 775
17	Sierra Leone Match Industries Ltd.	290 000	1976/77	32	E	9 062
18	Plastic Manufacturing (S.L.) Ltd.	274 000	1974	46	E	5 960
19	Sierra Leone Nail Manufacturing Col Ltd	257 000	1976/77	20	E	12 850
20	S.L. Explosives Ltd (Cartridges)	230 000	1976/77	12	E	19 167
21	Sierra Industrial Vestment Co. Ltd (SIVCO)	211 000	1973	75	D	2 813
22	Metal Ware Manufacturing Co.	192 594	1976	40	E	4 815
23	Sierra Leone Knitting Mills Ltd	188 500	1976/77	59	D	3 195
24	Washex Soap Co.	124 000	1973	57	D	2 175
25	Sierra Leone Paint Manufacturing Ltd.	100 000	1976	40	E	2 500
26	Salt Manufacturing Co. Ltd	100 000	1974	65	D	1 538
27	CFAO Motors Ltd.	300 000	1978	45	E	6 667
28	Metal Beds and Springs Manufacturing Co.	99 350	1974	43	E	2 310
29	Sierra Leone Shrimp Export Co. Ltd	80 800	1974	37	E	2 183
30	Feed Mill Products Limited	33 712	1978	21	E	1 700
31	Oriental Candle Factory	20 000	1976	18	E	1 111
32	Marble Tile Co. Ltd.	10 000	1976	16	E	625
	Total	49 867 297		4 380		
	Average investment per employee					11 385

Annex V

OUTPUT-VALUE DATA

	Industrial establishment	Output value (Leone)	Reporting year	Number of employees	Output per investment Le 1,000 (Leone)	Output per worker (Leone)
1	Petroleum Refining Co. Ltd.	29 932 007	1976/77	127	5 423	235 685
2	Sierra Leone Brewery Ltd	15 413 659	1978	389	1 2[illegible]	39 62[illegible]
3	Aureol Tobacco Co. Ltd.	13 054 680	1976/77	309[b/]	1 707	42 248
4	Seaboard West Africa Flour Mills Ltd.	9 279 212	1978	85	2 946	109 167
5	Palm Kernel Oil Mill	7 326 900	1977	300	2 617	24 423
6	National Confectionery Ltd. (NATCO)	4 217 655	1978	137	1 700	30 785
7	Freetown Cold Storage Ltd (Coca-cola)	2 300 000	1976/77	160	8 098[c/]	14 375
8	Chanrai Chemicals Ltd.	1 926 900	1976/77	79	964	24 416
9	Washer Soap Co.	1 579 020	1976/77	57	12 734	27 702
10	Forest Industries Corporation	1 560 839	1976	858	797	1 819
11	Sierra Leone Government Printing Press	1 368 066	1975/76	435	1 037	3 145
12	Sierra Leone Enterprises Ltd.	1 078 643	1976	98	3 595	11 007
13	Wellington Distillery	937 152	1976	47	1 [illegible]6	19 939
14	Feed Mill Products Ltd.	346 433	1978	21	23 700	40 300
15	Salt Manufacturing Co. Ltd.	624 000	1974	65	6 240[c/]	9 600
16	Sierra Leone Paint Manufacturing Ltd.	597 170	1976	40	5 972	14 929
17	Pangama Saw Mills Ltd.	543 449	1978	158	141	3 440
18	Sierra Leone Oxygen Factory Ltd	389 500	1976/77	47	877	8 287
19	Plastic Manufacturing (S.L.) Ltd.	375 [illegible]0	1974	46	1 370	8 160
20	Metal Beds and Springs Manufacturing Co.	374 330	1974	43	3 768	8 705
21	Sierra Leone Nail Manufacturing Co. Ltd.	343 100	1974	20	[illegible] 335	17 155
22	Sierra Leone Knitting Mills Ltd.	257 305	1976/77	59	1 365	4 361
23	Sierra Industrial Vestment Co. (SIVCO) Ltd.	222 336	1976/77	75	1 055	2 967
24	A.J. Seward	231 893	1977	27	-	8 589
25	Foam Manufacturing Co. Ltd.	222 000	1977	30	586	7 400
26	Oriental Candle Factory	209 300	1976	18	10 490	11 655
27	Sierra Leone Match Industries Ltd	194 629	1976/77	32	671	6 082
28	Cosmetic Pharmaceutical Co. Ltd.	145 950	1976/77	32	-	4 561
29	CFAO Motors Ltd.	166 568	1977/78	45	555	3 702
	Total	95 720 796		3 839		24 934

b/ Employment in Aureol Tobacco is adjusted to account for seasonal labour.

c/ The equity has been taken as equivalent to investment.

Annex VI

IMPORT LIABILITY

	Name of establishment	Reporting year	Consumption of materials: Imported (leone)	Consumption of materials: Local (leone)	Total cost of materials (leone)	Import liability per worker (leone)	Gross output value (leone)	Imports as percentage of output value
1	Petroleum Refining Co. Ltd	1976/77	27 033 619	-	27 033 619	212 863	29 932 007	90
2	Seaboard West Africa Flour Mills Ltd.	1978	6 123 483	-	6 123 483	72 041	9 279 212	66
3	Sierra Leone Brewery Ltd.	1978	4 023 508	-	4 023 508	10 343	15 413 659	26
4	Aureol Tobacco Co. Ltd.	1976/77	3 775 222	779 935	4 555 157	12 216	13 054 680	29
5	National Confectionary Ltd. (NATCO)	1978	2 204 265	665 810	2 870 075	16 090	4 217 655	52
6	Freetown Cold Storage Ltd.	1976/77	1 360 000	225 000	1 585 000	8 500	2 300 000	59
7	Sierra Leone Government Printing Press	1976/77	1 324 000	-	1 324 000	3 044	1 368 066	97
8	Chemrai Chemicals Ltd.	1976/77	1 132 336	97 250	1 229 856	14 333	1 928 900	59
9	Washex Soap Co.	1976/77	1 045 575	-	1 045 575	18 343	1 579 020	66
10	Feed Mill Products Ltd.	1978	473 260	155 994	629 254	22 536	846 433	56
11	Sierra Leone Enterprises Ltd.	1978	455 000	81 833	536 833	4 643	1 978 643	56
12	Wellington Distillery	1976/77	380 238	-	389 238	8 282	937 152	42
13	Forest Industries Corporation	1976/77	377 250	...	...	440	1 560 839	22
14	Metal Beds and Springs Manufacturing Co.	1978	309 023	3 151	312 174	7 087	374 330	82
15	Sierra Leone Paint Manufacturing Ltd.	1976/77	296 333	-	296 333	7 158	597 170	50
16	Sierra Leone Nail Manufacturing Co. Ltd.	1978	268 700	8 760	277 460	12 935	343 100	78
17	Pangwa Saw Mills Ltd.	1978	246 134	...	...	1 558	543 449	45
18	Oriental Candle Factory	1976/77	240 000	1 500	241 500	13 333	...	...
19	Salt Manufacturing Co. Ltd.	1978	188 700	-	188 700	2 903	624 000	30
20	Sierra Leone Knitting Mills Ltd.	1976/77	146 039	5 864	151 903	2 475	257 305	57
21	Plastic Manufacturing (S.L) Ltd.	1978	138 850	5 440	144 290	3 018	375 360	37
22	A.J. Seward	1976/77	119 360	-	119 360	4 421	231 893	51
23	Foam Manufacturing Co. Ltd.	1976/77	118 203	15 100	133 303	3 940	222 000	53
24	Sierra Leone Match Industries Ltd.	1976/77	82 000	100	89 000	2 563	194 629	42
25	Cosmetic Pharmaceutical Co. Ltd.	1976/77	55 002	-	55 002	1 833	145 950	38
26	Sierra Industrial Vestment Co. Ltd. (SIVCO)	1976/77	46 000	-	46 000	613	222 536	21
27	Sierra Leone Oxygen Factory Ltd.	1976/77	26 038	-	26 038	554	389 500	7
	Total		51 987 138	2 052 637	54 039 775		88 056 388	59
	Percentage of total cost of materials		96	4	100			

Total number of employees = 3,494

Average import liability per worker = Le 14,878

Average import liability per output value unit of Le 1,000 = Le 590

Annex VII

VALUE OF THE LICENCES ISSUED TO INDUSTRIAL ENTERPRISES BY THE MINISTRY OF TRADE AND INDUSTRY, 1977 and 1978
(Leone)

	Name of establishment	1977	1978
1	National Confectionery Ltd. (NATCO)	6 007 000	9 000 000
2	Honig Foods Industry	400 000	550 000
3	Oriental Candle Factory	400 000	550 000
4	Feed Mill Products Ltd.	165 000	40 000
5	Freetown Mattress Factory	-	60 000
6	Wilbram Enterprises	-	50 000
7	Sterling Products International Ltd.	250 000	450 000
8	Sierra Leone Explosives Ltd.	100 000	150 000
9	Sierra Industrial Vestment Co. Ltd. (SIVCO)	100 000	80 000
10	Sierra Leone Enterprises Ltd.	455 000	300 000
11	BP (Sierra Leone) Ltd	14 200	10 000
12	Shankerdas and Sons	300 000	500 000
13	Washex Soap Co.	200 000	150 000
14	Sierra Leone Oxygen Factory Ltd.	-	10 000
15	Sierra Leone Suitcase Works Ltd.	-	50 000
16	Salt Manufacturing (SL) Co. Ltd.	315 000	450 000
17	Metal Beds and Springs Manufacturing Co.	-	100 000
18	Shell Sierra Leone Ltd.	1 610 500	800 000
19	P.Z. (Sierra Leone) Ltd.	5 993 000	11 034 500
20	Sierra Leone Nail Manufacturing Co. Ltd.	677 089	2 500 000
21	Whitex Ltd.	25 000	15 000
22	Aureol Tobacco Co. Ltd.	2 000 000	3 000 000
23	Mobil Oil (Sierra Leone) Ltd.	14 000	62 750
24	Sierra Leone Brewery Ltd.	639 280	500 000
	Total	19 665 060	30 411 750

Annex VIII

EMPLOYMENT, SALARY AND WAGE BILL

	Name of establishment	Number of employees	Annual emoluments		Annual emoluments per employee	Annual gross output value	Total wage bill as percentage of output value
			('000 Le)	(%)	(Leone)	('000 Le)	
1	Sierra Leone Government Printing Press					1 368	40.6
	Managerial	92	192	34.53	2 087		
	Others	343	364	65.47	1 061		
	Total	435	556	100	1 278		
2	Sierra Leone Brewery Ltd.					15 413	5.63
	Managerial	29	393	45.27	13 551		
	Others	360	475	54.73	1 319		
	Total	389	868	100	2 231		
3	Amreol Tobacco Co. Ltd.					13 054	5.76
	Managerial	87	255	33.90	2 931		
	Others	222	497	66.10	2 239		
	Total	309	752	100	2 434		
4	National Confectionery Ltd					4 217	4.26
	Managerial	7	41	22.78	5 857		
	Others	125	139	77.22	1 112		
	Total	132	180	100	1 364		
5	Pangama Saw Mills Ltd.					543	27.62
	Managerial	8	74	49.33	9 250		
	Others	150	76	50.67	507		
	Total	158	150	100	949		
6	Petroleum Refining Co. Ltd.					29 932	1.37
	Managerial	31	99	18	3 193		
	Others	96	451	82	4 698		
	Total	127	550	100	4 330		
7	Chanrai Chemicals Ltd.					1 929	2.07
	Managerial	4	9	22.5	2 250		
	Others	75	31	77.5	413		
	Total	79	40	100	506		
8	Sierra Industrial Vestment Co. Ltd.					222	40.99
	Managerial	14	43	47.25	3 071		
	Others	62	48	52.75	774		
	Total	76	91	100	1 198		
9	Sierra Leone Oxygen Factory Ltd.					389	
	Managerial	3	44	20.85	14 666		
	Others	50	167	79.15	3 340		54.24
	Total	53	211	100	3 981		
10	Sierra Leone Paint Manufacturing Ltd.					597	3.68
	Managerial	8	9	40.90	1 125		
	Others	32	13	59.10	406		
	Total	40	22	100	550		
11	Sierra Leone Match Industries Ltd.					195	
	Managerial	2	6	23.07	3 000		13.33
	Others	30	20	76.93	666		
	Total	32	26	100	812		
12	Foam Manufacturing Co. Ltd.					222	
	Managerial	5	12	37.5	2 400		14.42
	Others	25	20	62.5	800		
	Total	30	32	100	1 066		
13	Feed Mill Products Ltd.					846	
	Managerial	4	9	37.5	2 250		2.83
	Others	20	15	62.5	750		
	Total	24	24	100	1 000		
14	Oriental Candle Factory					210	5.33
	Managerial	1	1	14.28	1 000		
	Others	18	6	85.72	333		
	Total	19	7	100	368		
	Total	1 903	3 509	100	1 843	69 137	5.08
	Managerial			34			
	Others			66			

	Name of establishment	Number of employees	Annual emoluments (1 000 Le)
1	Forest Industries Corporation	858	404
2	Freetown Cold Storage Ltd.	160	260
3	Salt Manufacturing Co. Ltd.	90	51
4	Seaboard West Africa Flour Mills Ltd.	85	126
5	Sierra Leone Knitting Mills Ltd	63	51
6	Washex Soap Co.	57	42
7	Wellington Distillery	47	84
8	Plastic Manufacturing (S.L.) Ltd.	46	67
9	Metal Beds and Springs Manufacturing Co.	45	28
10	CFAO Motors Ltd.	45	89
11	Cosmetic Pharmaceutical Co. Ltd.	32	9
12	A.J. Seward	27	51
13	Sierra Leone Nail Manufacturing Co. Ltd.	20	19
14	Aerosol Filling Co.	12	8
	Total	1 587	1 289

Annual emoluments per employee (leone)	Annual output value (1 000 Le)	Total wage bill as percentage of output value
470	1 560	25.89
1 625	2 300	11.30
566	624	6.17
1 482	9 279	1.35
809	257	19.84
737	1 579	2.66
1 787	937	8.96
1 456	375	17.86
622	374	7.49
1 978	166	53.61
281	146	6.16
1 888	232	21.98
950	343	5.53
666	...	...
812	18 172	7.09

Part two

DEVELOPING RESOURCE-BASED INDUSTRIES IN SIERRA LEONE

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

1. The investigation has shown that Sierra Leone has an enormous capacity to reverse its unfavourable balance of trade by developing industrial projects based on its potential resources which may be defined as:

(a) The raw materials already produced or which could be produced by the mineral and agricultural sectors of the economy;

(b) The entrepreneurial skills existing in the foreign-trade sector and their capacity to find either locally or abroad the finance, technology and expertise required for industrial projects;

(c) The export-market opportunities offered by the countries adjoining Sierra Leone.

2. There are, however, factors which are preventing Sierra Leone from making full use of its resource potential. Of these, the most important are:

(a) The absence of an enterprise-development agency in Sierra Leone which could synchronize and integrate developments in the primary and industrial sectors of the economy;

(b) The reluctance of private enterprise to invest in the agricultural and infrastructural development required for the realization of integrated projects;

(c) The absence of research facilities to evaluate minerals, agricultural materials and agricultural waste for possible industrial utilization;

(d) The absence of facilities needed for the growth and development of export-processing and export-oriented industries;

(e) The absence of a long-term plan for expanding production of existing industrial crops and initiating the cultivation of new industrial crops.

B. Recommendations

General

1. To synchronize developments in the primary and industrial sectors and to generate the establishment of industrial projects, either the proposed National Industrial Development Corporation should be set up, or public-sector agencies such as the Sierra Leone Produce Marketing Board (SLPMB), the Forest Industries Corporation (FIC), the Sierra Fishing Company and the National Development Bank should be re-organized to run subsidiary companies for each project.

2. To encourage private enterprise to finance and run integrated projects, the Government should develop schemes for sharing or reimbursing investment in the necessary infrastructure facilities.

3. FAO and UNIDO should be asked to carry out a joint mission, initially to explore the prospects for integrated projects in the field of agriculture-based industries, and subsequently to provide technical assistance in creating facilities in Sierra Leone for project development and implementation.

4. A feasibility study without the participation of a likely investor does not necessarily result in the implementation of a project even if found feasible. It is therefore proposed that a potential backer should be identified for each individual project prior to seeking technical assistance for carrying out a feasibility study.

5. UNIDO's offer to provide assistance in developing a project for an industrial free zone should be pursued.

6. The project-approval committee being established under the new Development of Industries Act should extend its activities to the field of co-ordinating development plans and should carry out a quarterly review of resource-based industries.

7. An evaluation should be made of the experience already gained in such fully-integrated projects as the Chinese sugar mill, partially-integrated projects such as the Gambia and Daru oil mills and projects entirely dependent on outside growers such as the Maboi fruit plant and the beniseed baby-food plant at Bo. This evaluation will indicate the most suitable pattern of industrial development based on primary resources.

Minerals

8. UNIDO has agreed to provide assistance in evaluating local minerals which could be used to develop building-material and ceramic industries, and in planning pilot projects.

9. UNIDO has agreed to provide the services of an expert to the team of consultants to be constituted by the Alusuisse subsidiary, Sieromco and the Government jointly for the purpose of carrying out a feasibility study on the alumina plant for which an agreement has already been signed with Alusuisse.

10. The production of sodium silicate, a basic material in detergents and laundry soap, should be established. Chanrai Industries Ltd have already made a proposal in this field to the Ministry.

11. Production of pigments from rutile, for which agreements have already been signed with the mining companies should be established.

12. A gem-cutting and gem-polishing unit and a jewellery-production industry, for which UNIDO has offered an expert, should be developed.

Agriculture

13. UNIDO should be requested to assist in the evaluation of agricultural produce and waste materials for potential industrial utilization. The facilities offered by the Tropical Institute in London or by other research laboratories abroad could be used for this purpose.

14. There are good prospects for expanding the cultivation of some existing crops and developing new crops for industrial utilization. The Ministry of Agriculture should be advised to proceed with the development or expansion of the following crops: sugar cane, cotton, rubber, wheat, cereals for malt, a dwarf variety of oil palm, chinchona from which quinine is extracted, maize and urena lobata.

15. In order to replace imported sugar, the services of a UNIDO expert should first be obtained to determine whether, under the conditions prevailing in Sierra Leone, it is more feasible to establish small-capacity mills (up to 10,000 tons per year) or normal-capacity mills (25,000 tons or more per year). Based on this study, new projects can be developed. There does not seem to be any hope of implementing the Tate and Lyle project whose economic return is poor.

16. The import of cotton and cotton-polyester textiles should be replaced. The National Development Bank is participating in the establishment of a textile-finishing mill. The Bank is also willing to finance the establishment of a spinning and weaving mill, providing the Ministry of Agriculture can establish the feasibility of large-scale local cotton production. A pilot project to test this should be carried out as soon as possible.

17. The possiblity of using cassava to produce starch, alcohol and chips should be pursued with UNIDO which has agreed to provide an expert in this field.

18. It is proposed that a new enterprise should be set up with the participation of National Confectionery Ltd and SLPMB to develop production of cocoa powder, cocoa butter and various by-products.

19. A new enterprise should be set up with the participation of SLPMB and Chanrai Industries Ltd to develop an edible-oil refinery using groundnut oil (60%) and palm oil (40%). The same enterprise could produce groundnut oil and butter.

20. The Mabole Fruit Company should be asked to develop and implement a project (if possible with the participation of Sierra Enterprises and Freetown Cold Storage who own bottling plants) to produce fruit concentrates to supply to the bottling plants and tomato paste which is at present imported.

21. SLPMB should develop an integrated project for the production of instant coffee under franchise.

22. National Confectionery Ltd. should be asked to develop a project for the production of essential oils and flavouring from ginger, mint and citrus peel.

Forestry

23. In the field of industrial projects based on forestry produce, priority should be given to projects for:

(a) The production of plywood and veneer for local use and for export;

(b) The production of particle board;

(c) The production of wood-based panels both for local use and export;

(d) The production of charcoal on a commercial scale to replace the consumption of fuel oil where possible.

24. UNIDO is already considering assisting the Forest Industries Corporation in setting up a timber-utilization laboratory.

25. The proposal of the Forest Industries Corporation to establish plantations of short-cycle tree varieties for the production of pulp for export should be implemented.

26. A pre-feasibility study carried out by UNIDO has established the possibility of producing paper and board from rice-straw pulp (80%) and imported wood pulp (20%). An enterprise should be developed to implement this project which would replace present imports and be able to export its surplus.

Fishery and marine resources

27. The Sierra Fishing Company should be advised to develop and establish a production line for canning sardinella and tuna and a fishmeal plant based on fish offal and low-quality fish.

The possibility of expanding the boat-building yard to develop service and repair facilities for the foreign fishing trawlers and to construct fibre-glass hulls for the local fishing boats should be investigated.

Livestock and dairy produce

29. The first priority in this sector is to achieve self-sufficiency in meat production through improving the livestock population growth rate, offtake rate and meat yield, for cattle, sheep, goats and chickens. It is proposed that a new enterprise should be developed for each integrated project which would necessarily include an animal- or poultry-feed plant, a commercial hatchery supported by a parent-stock farm, a meat processing plant and a by-products plant.

30. UNIDO should be asked for assistance in evaluating local materials which could be used for producing poultry and animal feed on a commercial scale. This could either be done through a short-term research project or by giving technical assistance to Njala University to carry out the evaluation.

31. The prospects for producing milk locally are still remote. A Sierra Leonean enterprise has recently presented a project for the establishment of a milk-reconstitution plant in collaboration with a Dutch company. This should be evaluated prior to authorization.

I. POTENTIAL RESOURCES FOR INDUSTRIAL DEVELOPMENT

The industrial resources of Sierra Leone lie in the potential offered by:

(a) The natural endowments of the country on which the primary sector of the economy is based;

(b) The entrepreneurial skills and expertise developed in the foreign-trade sector of the economy;

(c) The geographical location occupied by Sierra Leone on the map of Western Africa.

It is true to say that the future of industrial development in Sierra Leone will, for a long time to come, depend upon the success of efforts to exploit these three resources. Whereas the development and exploitation of primary resources is the responsibility of various Ministries, it is the exclusive domain of the Ministry of Trade and Industry to ensure an optimum use of the available entrepreneurial skills in the industrial utilization of these primary resources and of the export opportunities offered by the geographical location of Sierra Leone.

A. Strategy for an optimum utilization of entrepreneurial skills

The entrepreneurship developed in the foreign-trade sector has by now attained an adequate capacity to generate capital, acquire technology and market products. The role of the Ministry is to divert the efforts of entrepreneurs from trade into industry and from industry based on imported materials into export-oriented industries based on local resources. The new Development of Industries Act will equip the Ministry with a legal instrument, the skilful use of which should enable the Ministry to achieve this objective.

It is true that the market in Sierra Leone is too small to sustain industrial production. The regrettable fact, however, is that even this small market is not completely available to existing industry because of the import policy followed and the absence of adequate transport and distribution facilities. Consequently, local industry at present produces only for the urban market, and only those goods which can sell in competition with imported goods.

B. Strategy for exploiting potential export markets

Some industrial enterprises in Sierra Leone have already made efforts to exploit the export potential and have acquired a foothold in the markets of adjoining countries. The full development of the export market would, however, require a much more vigorous effort organized jointly by government and industry. A basis for this already exists in the form of the Mano River Union and the Economic Community of West African States (ECOWAS) and it is the responsibility of the Ministry to make the most of the opportunities offered by these supranational agencies to encourage the export of industrial products and the establishment of regional industrial projects.

C. The utilization of primary resources to improve the economic return of existing industry

A fact which should never be lost sight of is that no tax incentive to new industry, however attractive, is as effective as the demonstrable success of existing industry. Consequently, all efforts to improve profitability in general and the economic return in particular would lead to an improvement in the investment climate. In this field, however, the approach has to be specific and not general. For this reason, those industrial enterprises have been identified and listed in the Industrial Review, part one, which are capable of:

(a) Replacing the foreign source of supply of their respective raw materials with domestic sources;

(b) Exporting their products to adjoining countries;

(c) Making optimum use of installed capacity.

These enterprises are, and will remain, reluctant to make the additional investment required to achieve any of the foregoing objectives unless the commercial profitability of this investment is ensured. It is in this field that the Ministry of Trade and Industry has to work out options, specific to each case, to ensure profitability and to encourage these enterprises to make fresh investments. These options should be offered against a specific export target, a reduction in the import liability or an improvement in capacity utilization of an individual enterprise. The duration of each optional

incentive will be limited to a period determined in each individual case on merit and need. The options are many and will vary from case to case. Some possibilities are:

(a) Adjustments in the taxation structure (i.e. excise duty on products and import duty on materials) to ensure an improvement in profitability;

(b) A comparative review of the cost and price structure of locally-produced goods with those of competing imports to allow a better cost-price margin to local producers as compared to importers;

(c) The granting of import licences for attractive items to an industrial enterprise in exchange for the achievement of a given export target for its own locally-produced goods.

The development and exploitation of primary resources for existing and prospective industries, and attracting private investment for that purpose, requires continuing research and investigation to identify the enterprises capable of and willing to make investments if offered certain incentives.

D. The primary sector of the economy

Sound industrial planning for the future presupposes the synchronization of industrial development with that of the primary sector of the economy.

The immediate need is to initiate planning aimed at:

(a) Developing feasible industrial projects based on the use of existing materials which are surplus to local requirements;

(b) Identifying industrial materials whose import could be replaced by local production and evaluating the prospects for such production.

The primary sectors or subsectors of the economy capable of producing materials for industry in Sierra Leone are:

Mining
Agricultural crops
Forestry
Fishery and marine resources
Animal husbandry and poultry

The prospects for industrial development based on the performance of these sectors or subsectors are outlined in the chapters that follow.

Table 1. Distribution of GDP by type of economic activity at 1972/73 prices
(Percentage)

Economic activity	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	Average
Agriculture, forestry and fisheries	30.4	29.3	29.6	31.9	32.6	33.2	34.2	31.6
Mining and quarrying	17.8	16.1	16.4	13.6	11.2	6.9	8.4	12.9
Wholesale and retail trade	13.9	14.5	13.6	12.2	12.4	14.2	13.0	13.4
Transport and communications	10.8	11.5	11.5	11.0	10.0	11.2	12.2	11.3
Finance and insurance	8.3	8.6	8.9	9.0	8.7	9.3	8.8	8.8
Manufacturing and handicrafts	6.0	6.3	6.6	7.1	6.7	7.0	6.8	6.6
Construction	3.2	3.8	3.3	3.4	3.5	3.7	3.7	3.5
Electricity and water supply	0.4	0.4	0.4	0.3	0.4	0.5	0.5	0.4
Miscellaneous	1.2	1.5	1.7	1.5	1.0	1.0	1.3	1.3
Subtotal	92.3	91.8	91.5	90.4	88.8	88.2	89.5	90.3
Government services (public administration and defence)	7.3	7.8	8.1	9.0	10.8	11.3	10.0	9.2
Private services	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5
Total GDP at 1972/73 prices	100	100	100	100	100	100	100	100

Source: Central Statistics Office, Freetown.

II. THE UTILIZATION OF MINERALS

Sierra Leone has a mineral-rich economy. The importance of the mining sector to the economy of Sierra Leone can be gauged from table 1 on the previous page which shows the distribution of the Gross Domestic Product (GDP) by type of economic activity in 1972/73 prices.

The contribution made by the mining sector to the balance-of-payment position is reflected in table 2.

Table 2. Value of minerals exported and their share of total exports
(Millions of leone)

Item	1972	1973	1974	1975	1976	1977	1978
Total exports (FOB value)	89.51	103.70	119.05	125.26	114.34	156.53	135.93
Export of minerals (FOB value)	70.16	79.20	89.89	85.37	77.10	70.86	66.14
Minerals as a percentage of total exports	78.38	76.37	75.50	68.15	67.43	45.26	48.65
Mineral exports as a percentage based on 1972	100	112.88	128.12	121.67	86.02	57.74	69.64

The composition of the export of minerals is shown in table 3 in FOB value, and in table 4 in quantity. These tables are given on page 188.

A study of these tables together reveals the following situation:

(a) The contribution made by the mining sector to GDP has fallen from 17.8% in 1972/73 to 8.4% in 1978/79;

(b) The contribution made by minerals to the total foreign-exchange earnings of Sierra Leone has fallen from 78.38% in 1972 to 48.65% in 1978;

(c) The FOB value of the minerals exported has gone down from Le 70.16 millions in 1972 to Le 66.14 millions in 1978;

(d) The share of diamonds in the total foreign-currency earnings from minerals has gone up from 81% in 1972 to 95% in 1978.

The above situation seems to have been caused by giving up or closing down the mining of platinum (in 1949), gold(in 1956), chromite (in 1963) and iron ore (in 1975).

Table 3. Composition of mineral exports in FOB value
(Millions of leone)

Minerals exported	1972	1973	1974	1975	1976	1977	1978
Alluvial diamonds, uncut	21.72	30.32	51.02	24.59	38.76	31.15	36.54
Other diamonds	35.01	34.61	23.61	43.10	32.71	30.42	24.95
Cut and polished diamonds	-	0.05	0.14	0.17	0.75	1.41	1.49
Subtotal	56.73	64.98	74.77	67.86	72.22	62.98	62.98
Iron ore	10.16	11.11	11.38	13.19	-	-	-
Bauxite	3.27	3.48	3.74	4.32	4.88	7.88	3.16
Total export of minerals	70.16	79.20	89.89	85.37	77.10	70.86	66.14
Diamonds as a percentage of minerals exported	80.85	82.04	83.17	79.48	93.67	88.87	95.22

Table 4. Quantity of minerals exported

Year	Diamonds		Iron ore		Bauxite	
	(thousand carats)	(percentage of 1972 amount)	(thousand tons)	(percentage of 1972 amount)	(thousand tons)	(percentage of 1972 amount)
1972	1 847	100	2 284	100	602	100
1973	1 403	76	2 346	103	652	96
1974	1 631	88	2 082	91	729	107
1975	1 466	79	1 431	63	615	90
1976	1 874	101	-	-	569	83
1977	1 806	98	-	-	789	116

A. Present exploitation of minerals

There are only three minerals which are now being exploited. These are diamonds, bauxite and rutile. Other minerals such as iron ore, gold, chromite and platinum were being mined but, for various reasons, this has now ceased. A brochure issued by the Ministry of Mines on the mineral resources of Sierra Leone gives the following information.

Diamonds

Sierra Leone is one of the world's major producers of gem diamonds. These were first discovered in the Ghogbora stream in the Kono district in 1930. This led to the formation of the Sierra Leone Selection Trust Ltd. to exploit the deposits. In 1935, this company was granted a monopoly in the country. In 1955, the monopoly was broken and the company's operations were confined to an area of 310 square miles in the Kono and Kenema districts. This agreement brought into existence the alluvial diamond mining scheme under which Sierra Leoneans were able to mine alluvial diamonds. A new company (Diminco) was formed in which the Government acquired a 51% share and the remaining 49% was held by the Sierra Leone Selection Trust.

The diamond producing areas are in the Kono, Kenema and Bo districts. These are situated in the drainage areas of the rivers Baffi, Sewa and Woa. The Diminco leases are in Kono and Tongo, but the company has been prospecting in areas in Bo, Pujehun and Bonthe.

Sierra Leone has now developed a project for kimberlite mining and the project is likely to be financed from the Kuwait Fund. Industrial diamonds are also now being mined and exported.

Bauxite

This was found in 1928. In 1960, Alusuisse formed a subsidiary named Sierra Leone Ore and Metal Company (Sieromco) and obtained a lease over an area in the Moyamba district. Extensive deposits are found in the Mokanji and Gbibge hills. The company started mining at Mokanji. Another deposit has been found at Gondame across the river Jong.

In 1972, Sieromco obtained a licence to prospect in two areas, one at Pepel in the Port Loko district and the other in the Kumbia district.

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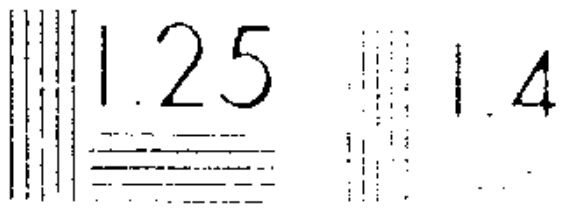
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Rutile

The largest rutile deposit in the world, it is said, occurs in the Moyamba and Bonthe districts of Sierra Leone. In 1967, Sherbro Minerals Ltd. began mining but gave it up in 1971 for technical reasons. Subsequently, a subsidiary of the Bethlehem Steel Corporation obtained a lease over 520 square miles in the Bonthe and Moyamba districts. Production has not yet started. Bayer-Preussag, a consortium from the Federal Republic of Germany, has a lease on the rutile deposits at Rotifunk in the Southern Province.

Rutile is titanium oxide, mostly used as pigment in the paint industry. Good concentrations of rutile in Sierra Leone range from 1% to 6%. Production data during the years 1967 to 1971, when production ceased, are as follows:

Year	Quantity (tons)	Value (leones)
1967	18,918	881,736
1968	5,629	374,860
1969	15,840	980,400
1971	16,120	1,236,300

Iron ore

Deposits have been found in the Marampa, Begla Hill, Tonkolili and Pujehun districts. The Sierra Leone Development Company (DELCO) started mining at Marampa in 1933 and went into voluntary liquidation in October 1975. The Government has been trying to re-open these mines and arrangements for this are now being finalized.

Gold

This is found in the schist belt of the Sula mountains, Kangari hills and Nimini hills. The main producing areas have been Dalakuru, Kalmar and Makong. Gold mining stopped in 1956 with the introduction of the alluvial diamond mining scheme.

The gold miners became diamond miners. However, prospects of revival in this field are very promising. A Canadian mining company (Cominco) has started prospecting in the Baomahun area.

Chromite

This was being mined in the Kambui Hills near Bambawo in the Kenema district from 1937 to 1963. The mine was closed down because of the heavy transport costs.

B. Mineral deposits awaiting evaluation and exploitation

These are as follows:

Copper
Lead
Zinc
Nickel
Molybdenum
Clays
Lignite
Cassiterite
Syenite
Quartz
Silica sand
Feldspar
Building stone (sandstone)

In this connection, it should be said that geological mapping is not yet complete. Detailed maps (scale 1:50,000) are available for only 20% of the total surface area.

It has not been possible to exploit most of the mineral deposits mentioned above because of:

(a) The high investment cost of the infrastructure facilities required;
(b) The absence of mineral evaluation facilities;
(c) The absence of industries which can use or process these minerals.

In the case of certain minerals, it will be necessary to plan integrated projects to develop mining and industrial utilization simultaneously. Prospects for the industrial utilization of the mineral resources are outlined in the paragraphs that follow.

C. The industrial utilization of minerals

Bauxite

The Swiss aluminium company, Alusuisse, (operating in Sierra Leone under the name Sieromco) holds concessions on both the accessible deposits of bauxite at Mokanji and Port Loko. However the company is at present engaged in the exploitation of the deposit at Mokanji.

The deposit at Port Loko is poor in alumina content and the company has proposed to the Government that a plant be established at Pepel in Port Loko for reducing bauxite ore to alumina for export. Preliminary studies have been carried out both by Alusuisse and experts in the Ministry of Development. These studies indicate that the establishment of the proposed plant would result in a phenomenal increase in export earnings from bauxite. The study carried out by a UNIDO Expert in 1979 gives the following estimates.

Proposed capacity per year	600,000 tons
Likely investment cost of the project	$US 400 million
Annual export earnings from alumina	$US 80 million

The above data requires up-dating to take inflation into account. The rough estimates, in 1981 prices, for the capacity proposed, would be as follows:

Investment cost (rough estimate)	$US 750 million
Export earnings from alumina	$US 150 million

Although the investment cost of the project is very high, this is the only industrial project so far identified which would be able to reverse the present unfavourable balance of trade.

It is understood that the Government has already signed an agreement with Alusuisse to carry out a joint feasibility study on the project. The agreement signed does not lay down a timetable and the company does not seem to be in a hurry to fulfil its obligations under this agreement.

It should be said that this project was included in the National Plan (1974/75 - 1978/79). Although the plan has now run its course, the only outcome so far is the agreement mentioned above.

In view of the export-earning capacity of the project and the growing trade deficit of Sierra Leone, this project was included in the brief prepared for the visit of the Minister of Trade and Industry to UNIDO headquarters in Vienna in March 1980. UNIDO offered to provide the services of an expert to work on this project. The Ministry of Development accepted the offer and informed UNIDO in 1980 that, under the agreement with Alusuisse, the Government is required to provide three experts on the team to be constituted by Alusuisse to carry out the feasibility study. As and when the Alusuisse proposal for the constitution of the proposed team is received, the Government would take up the UNIDO offer.

It is hoped that the proposed feasibility study will investigate the following aspects of the project:

(a) The energy requirements of the project are 0.3 tons of fuel oil per ton of alumina. The project will, therefore, require around 180,000 tons of fuel oil annually;

(b) Caustic-soda requirements will also be very heavy although the expert has no criterion for assessing its likely consumption.

It is, however, normal for developing countries to integrate caustic-soda production with that of alumina. The only resource from which caustic soda can be produced in Sierra Leone will be solar salt. A project for the local production of solar salt has already been developed. But if it is decided to produce caustic soda locally, this would give a new dimension to the solar-salt project.

It is, therefore, proposed that the team which will carry out the feasibility study for the alumina project should also be required to assess and, if necessary, to review the solar-salt project.

Bauxite is also used for the production of high-alumina bricks and refractories used in steel furnaces and industrial furnaces of all sorts. In this field, another feasibility study is needed on the possibility of using the facilities available at the clay-brick factory in Freetown. If this factory could be converted for the production of refractories, its export earning would be very large and the clay-brick factory, at present closed, would be revived. It is, therefore, proposed that a feasibility study should be carried out on the above basis.

Rutile

Rutile provides a base for the production of certain pigments used in the paint industry. If these pigments are produced locally, export earnings from rutile will be increased. Sierra Leone has two workable deposits of rutile one of which is located on Bonthe Island and the other at Rotifunk. These deposits are at present leased to the Sierra Rutile Company, a subsidiary of Bayer-Preussag in the Federal Republic of Germany. It appears that, under the agreement with the Government, the company is required to establish pilot processing plants in both areas as follows:

(a) Bonthe deposit. A pilot plant of 30,000 tons capacity will be set up initially and will later be replaced by a commercial plant with a capacity of 75,000 tons;

(b) Rotifunk deposit. The capacity of the plant proposed is 75,000 tons.

Progress so far achieved on the establishment of these plants is not known. The export data indicates that these plants are still not in operation No export of this mineral is reported after 1971. It is proposed that the Ministry of Development should review the matter and ensure the industrial utilization of this mineral.

Diamonds

Sierra Leone is known for its very high-quality diamonds. Efforts made in the past to develop a gem-cutting and gem-polishing industry did not prove fruitful. The only unit established, with the participation of Government in the equity, is based on imported diamonds. The pieces of jewellery on which diamonds are mounted are also imported. The economic return of this unit is marginal if not negative. The National Plan (1974/75 - 1978/79) proposed the establishment of another unit in a diamond-producing area based on local diamonds and using the skills developed by the aforementioned unit at Freetown. This project was not developed or launched during the plan period. This project was also included in the brief prepared for the visit of the Minister of Trade and Industry to UNIDO Headquarters in March 1980.

There is an International Moretary Fund (IMF) expert in the Ministry of Finance who has proposed the integrated development of gem cutting and

polishing, jewellery production and tourism. This, he feels, will ensure an optimum export value for the diamonds produced. This is a proposal which, it is hoped, will receive the attention of the Ministeries of Mining and of Trade and Development.

Sierra Leone also produces industrial diamonds from which diamond-pointed dies and bits for drills are produced.

The existing diamond-cutting and diamond-polishing unit yields diamond powder as a by-product. This powder is used in optical industries.

In conclusion, it may be stated that the development of industries based on diamonds is liable to certain risks. The Government is fully conscious of this situation. It therefore seems more advantageous to concentrate on streamlining diamond mining and trading activities and to make a large investment in Kimberlite mining than to develop diamond-based industries. However, for the value of the diamonds to be optimized, it would be necessary to work on the ideas proposed by the IMF expert.

D. Building-material and other industries

Sierra Leone has at present two other mineral-based projects. These are the cement-clinker grinding and bagging plant and the clay-brick factory in Freetown. In the case of both these projects, Sierra Leone's experience has been disappointing.

The cement plant was closed down several years back. One reason why this plant has remained idle for so long has been uncertainty as to whether it is economically more viable to import cement or clinkers. The importers of cement have been in favour of keeping this plant idle. At present, a local expatriate enterprise has taken over the plant and is making arrangements for its reactivation.

Sierra Leone does not have limestone, a basic material for cement production, and has no other alternative but to import cement or clinkers.

As regards the clay-brick factory, this has proved to be a white elephant. It is an over-capitalized project, equipped with a periodical kiln and based on clay transported from remote areas. Consequently, its products will never be able to compete with cement blocks in the local market and the brick facings produced will never be competitive in the export market. Furthermore, the

presence of a high alumina content in the clay of Sierra Leone results in higher firing costs.

In section C above, the suggestion was made that the possibility of using the facilities available in this factory for the production of exportable refractory materials should be explored. This proposal should be pursued.

In view of the situation outlined above, the UNIDO project, SIL/78/002, has made the following proposals.

Clay-brick industry

Sierra Leone's balance-of-trade position does not permit an excessive use of cement in the construction industry. The clay-brick factory already established has closed down because it was over-capitalized and wrongly located. On the other hand, it is necessary to replace the import and use of cement as far as possible. Therefore, it is proposed that another, different project should be planned for the production of clay bricks. Firstly, the project should be located in a place close both to the clay deposits and to the market. Secondly, the project should be based on intermediate technology. Thirdly, the possibility of using charcoal in place of liquid fuel for burning bricks should be investigated.

Stone-cutting

Sierra Leone has deposits of building stones. A project for establishing stone-cutting and polishing would be a step in the right direction.

Production of sanitary ware and pottery

Sierra Leone has the basic materials for producing stoneware, porcelain and earthenware. Some rudimentary skills are also available in the small-industries sector. It has therefore been proposed that, as a first step, a pilot project should be established to:

(a) Evaluate the materials available and develop plans for their extraction if found suitable;

(b) Develop processes and formulations for producing the bodies, glazing and firing;

(c) Assess the market prospects.

UNIDO has been requested to provide the services of an expert for this pilot project.

Production of sodium silicate

Sierra Leone has deposits of good-quality silica sand and an adequate market for glass products (bottles and glassware). The Mano River Union has, however, given union status to the glass factory being established in Monrovia with Indian collaboration. This means that a glass factory cannot now be established in Sierra Leone. In the circumstances, it is proposed that the prospects for producing sodium silicate should be considered. This is used as a filler in the production of laundry soap.

At present, sodium silicate is imported to meet the requirements of two laundry-soap plants in Freetown. If locally produced, sodium silicate could also be exported for the same purpose to adjoining countries.

Chanrai Industries Ltd., an expatriate enterprise in Freetown, has already applied to the Ministry for authorization to develop this project. It is proposed that permission should be granted on condition that the project is accompanied by a detailed feasibility study.

E. Prospects for the industrial utilization of iron oxide and iron scrap

Information available indicates the existence of large-scale deposits of iron oxide. It is proposed that expert assistance be sought for their evaluation. The Government is attempting to re-open the iron mines closed in 1975.

Similarly, the leftover stock of the defunct railway includes re-meltable, re-rollable and re-usable iron scrap. The latter is at present being used by the National Workshop. The Prospect for developing steel-casting facilities at the Workshop is under investigation and this may result in the establishment of an arc or induction furnace to process re-meltable scrap. Proposals have already been made in part one of the Industrial Review for casting billets in the proposed steel furnace, and for setting up a rolling or re-rolling mill to make the re-use of iron scrap possible. Sierra Leone at present imports steel bars, angle iron, and other sections and sizes of structural steel. These imports range from 3,000 to 4,000 tons per year. In view of the growing import liability, the prospect for establishing a re-rolling mill with a capacity to produce 20 tons of rolled material per eight-hour shift look promising and should be investigated.

III. THE UTILIZATION OF AGRICULTURAL CROPS

A. Agricultural resources of Sierra Leone

Table 5. Land utilization in 1970/71

Description	Area (acres)	Area (percentage)
Total surface area of Sierra Leone	17 727 360	100.00
Total arable land	13 244 140	74.71
Total arable land:	13 244 140	100.00
Upland	10 625 940	80.2
Swamp land	2 618 200	19.77
Total arable land:	13 244 140	100.00
Area under small farms (with an average of 4.5 acres)	1 286 348	9.71
Area under large farms (with a minimum of 50 acres)	13 138	0.10
Institutional farms	5 668	0.4
Total area under cultivation	1 305 154	9.85
Total arable land:	13 244 140	100.00
Area under cultivation	1 305 154	9.85
Area under forest reserves	705 234	5.32
Area under protected forests	86 168	0.65
Total area under forests	791 402	5.97
Total area under use	2 096 552	15.82
Total arable land:	13 244 10	100.00
Area under use	2 096 556	15.82
Area available for agricultural expansion	11 147 584	84.18

Source: Data extracted from Agricultural Statistical Survey 1970/71. (Sierra Leone, CSO 1976).

A look at table 5 shows that, of Sierra Leone's 13.24 million acres of arable land, 1.30 million acres are under cultivation, a further 0.79 million acres under forest, leaving 11.15 million acres available for agricultural development.

The factors responsible for keeping so much cultivable land idle are the land-tenure system and the heavy investment cost of bush clearance and land development. However, it appears from the agricultural census of 1970/71 that,

since 1965 when the first census was undertaken, the acreage of land under cultivation had been growing at 5.36% per year. If this rate of growth has been maintained, the area under cultivation in 1980 should be 2.4 million acres. There is no source from which this can be verified.

As regards water, Sierra Leone is a country of heavy rainfall with as many as 10 slow-moving rivers, numerous streams and lakes. However, Sierra Leone has yet to embark upon a plan for water development to provide irrigation and drainage facilities for agricultural production.

Despite its vast land and water resources, Sierra Leone is a country of bush and subsistence farming. Another look at table 5 will show that 98.5% of total land under cultivation is composed of farms whose average size is 4.5 acres. The use of bullock or other animal power for cultivation is unknown. A subsistence farmer relies on his muscles and hand tools to win his livelihood. Cultivation with tractors is of recent origin and these are mostly used on institutional farms. The total area of these farms is 5,668 acres. Tractors are also used on large farms of 50 acres or more, both in the public and private sectors. The total area of these farms is 13,138 acres.

Modern agricultural practices are being introduced to improve productivity. These include better implements, improved seed, chemical fertilizers and insecticides. Apparently, the absence of mechanized farming does not permit the optimum use of modern agricultural practices.

In recent years, large-scale mechanized farms have been established either to supply industrial projects like the sugar and palm-oil mills or to establish the cultivation of new crops on a commercial scale as in the case of rubber and coconuts. Since all these farms are in the public sector, it is assumed that these occupy either state land or tribal land acquired on a long-term basis. Whichever is the case, the promotion of agriculture-based industries requires wide use of this pattern of integrating farming with industry.

B. Scope of agriculture-based industries

Agriculture-based industries can be established either on the basis of existing crops or to exploit the potential for new crops. In the case of the latter, the potential can best be exploited by promoting integrated agro-

Table 6. Principal crops, acreage under cultivation, production and average yield per acre

Crop	Average area under crop (acres)	Average area under crop (percentage)	Production (tons)	Yield per acre (tons)
Rice	807 557	61.26	442 879	0.56
Coffee	176 078	13.35	19 650	0.11
Cocoa	115 861	8.74	6 431	0.06
Cassava	41 180	3.12	81 179	1.97
Groundnuts	34 128	2.59	14 917	0.44
Maize	25 891	1.96	10 403	0.40
Kola nuts	18 497	1.40	3 964	0.21
Sweet potatoes	17 339	1.32	18 30[illegible]	1.06
Millet	14 090	1.07	6 290	0.45
Oranges	11 862	0.90	46 333	3.90
Guinea corn	11 737	0.89	25 829	2.20
Cocoyam	10 993	0.83	21 671	1.97
Bananas	10 222	0.78	13 689	1.34
Beniseed	4 431	0.34	791	0.18
Fundi	3 385	0.26	907	0.27
Coconut	3 188	0.24	1 879	0.59
Plantain	1 972	0.15	1 056	0.54
Pineapples	1 969	0.15	15 821	8.03
Mangoes	1 731	0.13	3 476	2.01
Chinese yams	1 018	0.08	1 590	1.56
Paw-paw	1 120	0.08	600	0.94
Broad beans	782	0.06	349	0.45
Bread-fruit	393	0.03	7 900	20.08
Tangarines	248	0.02	776	3.12
Lemons or limes	198	0.02	620	3.12
Grapefruit	155	0.01	775	4.99
Avocados	151	0.01	303	2.01
Sugar cane	28	-	369	13.39

Source : Agricultural Statistical Survey 1970/71. (Sierra Leone, CSO, 1976).

industrial projects. In the case of the former, industrial projects can be planned where:

(a) Agricultural produce is surplus to local consumption and the surplus available is sufficient to supply the requirements of an industrial plant of minimum economic capacity;

(b) The prospects for exporting the processed produce are as promising as those for the raw produce;

(c) The prime objective is the replacement of large imports of finished products such as sugar and cotton textiles;

(d) It is necessary to improve the domestic value added of the existing industry by replacing the import of intermediary products such as malt extract, fruit-juice concentrates, starch, wheat flour and the like.

To determine the potential of agriculture-based industries, investigations on a large scale are required. They should encompass agricultural factors, infrastructural limitations, export market prospects and internal market possibilities.

C. Agricultural production

The agricultural census of 1971/72 revealed 29 principal crops being cultivated in Sierra Leone. For details see table 6 on the previous page.

More recent data (1974/75 to 1978/79) is available for only 10 principal crops and these are presented in table 7.

Table 7. Production of major crops from 1974/75 to 1978/79

Crops	1974/75	1975/76	1976/77	1977/78	1978/79	Average growth or decline per year (percentage)
	(thousands of tons)					
Rice	518.7	570.6	610.5	630.6	630.6	4.3
[illegible]	21.0	22.0	22.0	22.0	26.0	4.7
[illegible]	7.5	8.0	8.5	8.5	9.0	4.0
[illegible]oil	38.4	42.4	44.5	40.0	48.0	5.0
Ginger	10.3	10.5	10.7	10.7	12.0	3.3
Beniseed	0.9	0.9	1.0	1.0	1.0	2.2
Kola nuts	5.3	5.3	6.7	8.9	8.9	13.5
Palm kernels	48.0	53.0	38.2	35.0	37.1	-4.5
Piassava	4.1	3.0	3.2	3.9	3.9	-0.9

Source: CSO Statistical digest.

As is evident, there are only two crops whose average annual increase in production is worth mentioning. These are ginger and kola nuts.

The following paragraphs give separate consideration to those agricultural crops which are wholly or mainly exported, those which are consumed locally, and those which have to be supplemented by imports.

D. Crops produced entirely or mainly for export

In the case of the following crops, the question to be discussed is how far the export of raw produce can be replaced by that of industrial products processed from these crops.

Coffee

Sierra Leone produces an average of 23,000 tons of coffee annually and earns around Le 9 million from its export. This is a scheduled crop of the Sierra Leone Produce Marketing Board. It is understood that some years back the Board established a plant to produce instant coffee but that this failed, apparently due to an insufficient export market for instant coffee.

It does not seem sensible to risk present foreign-currency earnings from coffee beans through converting them into instant coffee for export. Instant coffee would be exportable only if produced under franchise from international companies with well-known brand names such as Nestlé or Maxwell House.

The first step should, therefore, be to try and obtain the collaboration of an international coffee company, and then to develop an integrated project including a new, large coffee plantation which would supply the instant-coffee plant. The investment promotion section of UNIDO would be willing to find a foreign partner who can assume responsibility for export marketing of instant coffee.

Cocoa

Present production is around 29,000 tons and is adequate to supply a plant of viable economic size to produce cocoa butter and cocoa powder. Such a project, if established, would provide a base for the growth of the chocolate-confectionery industry in Sierra Leone. Imports could be replaced and the

surplus exported. There is also a ready export market for both cocoa butter and powder. The prospects for industrial utilization of cocoa are more promising than for coffee. In this field, even a franchise may not be necessary. The risk of losing existing foreign-currency earnings by producing cocoa butter and powder is much less than that of producing instant coffee.

Foreign investors are interested in the proposed project. Evidence of this is available in the records of the Ministry which contain investment proposals received from foreign companies for the establishment of a plant to produce both cocoa and butter. These should be passed on to the Sierra Leone Produce Marketing Board for investigation. It is for the SLPMB to take a decision as to whether cocoa should be processed locally and to determine how far the export value of cocoa can be improved by that means. This decision will need to be based on a technical-economic study.

Palm fruit and palm kernels

Sierra Leone has vast resources of wild oil palms. The agricultural census (1970/71) mentions as many as nine million oil-palm trees standing in the bush land. Oil is obtained both from the palm fruit and from its kernel. This resource, at present, supplies the rural palm-oil industry based on manual processing, the SLPMB palm-kernel oil mill and SLPMB exports of both palm kernels and palm oil.

It is not known whether an optimum use of this resource is being made or is possible. As will be seen from table 7, the quantity of palm kernels procured by SLPMB annually from 1974 to 1979 was 42,000 tons on average. This table also shows a downward trend in production. The average annual decline was 4.5%. During 1978/79, the quantity of palm kernels offered for sale was only 37,100 tons. Production of palm-kernel oil for export has, however, not declined. During the 5 years (1974/75 to 1978/79), the average annual quantity of palm oil produced amounted to 42,000 tons, the average annual growth to 5%. The situation at present is that resources of wild palm are on the decline. To ensure stability of supplies for the edible-oil industry which is gradually being expanded and modernized, the Ministry of Agriculture has established integrated projects at Daru and Gambia Mattru for the production of palm oil and SLPMB has established a subsidiary company to promote the cultivation of groundnut and other oil seeds and has simultaneously equipped its palm-kernel mill with preparatory machinery for processing groundnut and other seeds.

It is hoped that, based on the results of these projects, it will be possible for Sierra Leone to plan the growth of a modern edible-oil industry on a commercial scale and with a view to increasing exports.

Sierra Leone is already a net exporter of edible oil but the fact remains that refined vegetable oil is at present imported for consumption in urban areas and distilled fatty acids are imported for use in the laundry-soap industry.

SLPMB was advised by the UNIDO project to establish an edible-oil refinery which could replace the import of both these items. It appears that the proposal was investigated by a foreign consultant who advised SLPMB to establish the proposed refinery based on imported soya-bean oil. In the opinion of the expert, this would not be advisable. The refinery should be established based on local resources and the refining costs controlled by mixing 40% of palm-kernel oil with 60% of groundnut oil.

Sierra Leone's potential for developing the export of vegetable-oil products is unlimited. It would, of course, require the introduction of new varieties of palm, the expansion of coconut and groundnut cultivation, and the planning and implementation of integrated projects. To realize these objectives, it is proposed that:

(a) The possibility of collaboration with Malaysia (the world's largest producer of palm oil) should be explored;

(b) The possibility of fielding a joint mission by FAO and UNIDO to develop a long-range programme for this industry should be considered;

(c) Private enterprise should be encouraged to play a part in this development by relaxing the SLPMB monopoly and transfering the six SLPMB palm-oil mills to private-enterprise ownership.

Piassava fibre

This is a hard fibre obtained from the bamboo palm and exported to Europe for the production of brooms and brushes.

The production data in table 7 show a downward trend in the production of piassava fibre during the period 1974/75 to 1978/79. The average annual production was 3,600 tons which is 50% of the amount exported in previous years. It can therefore be concluded that demand for piassava fibre abroad is declining.

Apart from the shrinking export market, there are other reasons why the conversion of this fibre into brushes and brooms for export is a doubtful proposition. Brushes produced from this fibre are used for a specific purpose, i.e. snow sweeping. Sierra Leone had been exporting this fibre through traders and is not in touch with the brush manufacturers abroad who use this fibre. It is also not possible to produce brushes from syntnetic or soft fibre on the same machinery which produces brushes from piassava hard fibre.

Ginger

The agricultural production data in table 7 show that production of ginger has gone up from 8,000 tons to 16,000 tons per year during the 5-year period from 1974/75 to 1978/79. The export in FOB value has also gone up from Le 310,000 during 1975 to Le 1.33 million during 1979.

Unlike the previous four crops (coffee, cocoa, palm kernels and piassava), the entire production of ginger is not exported. Some is sold at a very cheap price on the local market for internal consumption. Prospects for the industrial utilization of this crop so far investigated have not been promising. The demand for ginger abroad is limited. The only feasible alternative which could be investigated is the establishment of an essential-oil factory, based on ginger and other aromatic shrubs, herbs and fruit, for the production of flavourings, essential oils and aromatic extracts. These, in the beginning, could include, ginger, mint and skins of citrus fruit such as oranges, lemons etc. All these are available in abundance. Gingerine, produced from ginger, is used in biscuits and food industries but its export market is said to be limited. Future investigations should therefore concentrate on assessing the export market for gingerine, lemon oil and mint oil.

The prospects for producing dried ginger powder for export are more promising.

E. Crops which are consumed locally

If the data presented in tables 6 and 7 are analysed, it is possible to identify crops produced for local consumption. Among these, the following crops are suitable for industrial processing.

Crop	Average production per year (tons)
Cassava	81,000
Groundnuts	15,000
Sweet potatoes	18 000
Oranges	50,000
Bananas	15,000
Plantains	15,000

It is possible to expand the production of any of these crops and if, after appropriate investigation, it is decided to process any of these, it would be necessary to develop integrated agro-industrial projects.

Cassava and sweet potatoes

Cassava can be converted into chips for poultry feed. This project was included in the National Plan (1974/75-1978/79) but did not attract private enterprise. In poultry feed, cassava chips can replace maize which is at present imported for that purpose.

A UNIDO expert has also proposed the production of cassava flour and its blending with wheat flour prior to sale. This proposal was also supported by the National Plan.

Cassava and sweet potatoes can also be used for the production of starch and its by-products.

The prospects for producing alcohol from this material on a commercial scale could also be investigated. The Government has requested UNIDO to provide the services of an expert to investigate the industrial utilization of cassava and sweet potatoes by working out the economics of the available alternatives and to develop a project for making the optimum use of this material for industrial purposes.

Groundnuts

Sierra Leone at present produces 15,000 tons of groundnuts annually Some years back, an oil mill based on groundnuts was established at Bo with an output capacity of 5,000 tons per annum. The project failed. It has not,

so far, been possible to find out the reasons for the failure. However, it is assumed that groundnuts are at present eaten as such and a surplus is not available for milling. SLPMB is now making an effort to expand groundnut cultivation. It has also added preparatory machinery to its palm-kernel oil mill so that oil can be extracted from groundnuts. The industrial engineer of the UNIDO project has investigated the possibility of establishing small-scale oil mills based on groundnuts. His investigation revealed that the prospects for producing groundnut butter are not promising. Imports of this commodity, which could be replaced by local production, are small, and there are no export prospects. However, he established that, compared to large-scale mills small-scale groundnut-oil mills are more viable.

Fruit and fruit products

Sierra Leone produces a large variety of fruit in commercial quantities. These include citrus fruit, pineapples, bananas and mangoes. (For production data see table 6).

Sierra Leone has developed a beverage industry. The bottling plants produce synthetic drinks such as coca cola as well as semi-natural drinks such as ginger ale, orangeade, mendrine and ginger beer. Fruit extracts and flavourings are at present imported for the production of almost half a million cartons of soft drinks. Sierra Leone also imports canned juice in large quantities, the average annual import being around 4,000 hundredweight. In addition, 30,000 hundredweight of tomato paste is imported annually.

The services of an Italian consulting firm were used in preparing a project to produce canned juices, tomato paste and fruit concentrates for supply to the bottling plants. This project was included in the National Plan.

A project has been implemented to produce juice which is packed in plasticized paper containers. The project was designed without its own orchards and difficulties have arisen in the procurement of fruit in sufficient quantities. Since fruit juices are not being packed under franchise from well-known companies in developed countries, the quality produced does not qualify for export.

It is proposed that, instead of establishing a new project, the existing project at Mabole should be balanced, expanded and equipped with a concentrate plant, a can-making unit, an orchard of its own and the franchise required for making quality products.

F. Crops which must be supplemented by imports

Sierra Leone has a shortage of food and imports cereals of all sorts, rice, sugar and even vegetables. The main imports are as follows:

Produce	Average annual import (tons)
Unmilled wheat	30,000
Wheat flour	8,000
Meal and groats (excepting above)	6,000
Grain for malt	1,500
Malt extract	100
Rice	70,000
Maize	1,000

Cultivation of wheat and barley is only possible in the Northern Province which produces sorghum, millet, cocoyams etc. Wheat flour is consumed in the urban areas only and demand for it has increased with the establishment of a wheat-flour mill and a biscuit factory. The import of wheat could be reduced by mixing cassava flour with wheat flour to the degree which is acceptable or by replacing white flour by brown flour.

The staple foods of Sierra Leone are cassava and rice, but the consumption of maize has been growing. To reduce imports, the Government has been concentrating on attaining self-sufficiency in rice and maize. The economics of rice production would improve if rice straw, rice bran and rice husks could be industrially utilized. A UNIDO expert has produced a pre-feasibility study on the establishment of a paper-and-board mill based on rice straw (80%) and imported pulp (20%). This has been included in the mid-term programme. The wheat-flour mill produces mill feed equivalent to 30% of the wheat milled. There are five rice mills which produce rice bran equivalent to 5-7% of the rice milled. Both these materials can be used for the production of poultry feed. The existing poultry-feed plants will not be interested in making use of this resource so long as they are allowed to import maize and concentrates. It is for the Ministry to ensure that production of poultry feed is based on local resources, (i.e. mill feed, rice bran, fish meal and oil cake) and, for the purpose, to develop new formulations with the assistance of FAO.

G. New industrial crops

Sierra Leone has successfully developed sugar-cane and rubber plantations on a commercial scale. Efforts to establish the production of urena lobata, a jute substitute, are under way. The prospects for cotton production on a commercial scale have still to be explored.

Sugar cane

Sierra Leone consumes around 30,000 tons of refined sugar annually and the entire amount is imported. Sugar cane was previously grown in small, non-commercial quantities and doubts were expressed as to whether its cultivation was sufficient to supply a sugar mill of economic size. Consequently, the Government commissioned a sugar firm to investigate the issue. As a result, seven locations were identified as suitable for the large-scale production of sugar cane.

The National Plan included a sugar-mill project with an annual capacity of 40,000 tons based on a study carried out by another firm. This project was not implemented.

With the assistance of the People's Republic of China, a small mill (annual capacity 10,000 tons) has been established at Mamunta near Makeni. This is also equipped with a distillery.

Another study was commissioned for a large-scale project. The investment cost of this project emerged as Le 125 million and the economic return as marginal. The cost of the Chinese project is around Le 10.5 million and the economic return is positive. The issue which requires study is what capacity size is most suited to the agricultural and infrastructural conditions prevalent in Sierra Leone. Another factor to be considered is the choice of technology. It is now established that the use of modern as compared to conventional technology is possible on a small scale. A representative of a Danish enterprise visited Sierra Leone in 1979 and offered sugar mills with an annual capacity ranging from 6,000 to 10,000 tons, with a guaranteed sugar recovery and production costs comparable to those of large-scale mills. It is proposed that an impartial study should be commissioned on both capacity and technology before deciding on a course of action.

Rubber

At present, the area under rubber plantations in the public sector is 4,500 acres of which 2,600 acres are tappable, and in the private sector is 800 acres. Present production in the private sector is around 10,000 kilogrammes per year. Production in the public sector is not known. Rubber is exported in the form of latex, cup lump and sun-dried coagulum.

Demand for natural rubber is once again moving upward and this offers an incentive to Sierra Leone to investigate the prospects for increasing rubber production, initially exporting rubber as a raw material and, subsequently, developing a rubber-products industry. The prospects for producing leather in Sierra Leone, where hides and skins are consumed as food, are remote. There already exist two shoe factories which produce beach sandals and other footwear whose uppers are produced from imported artificial leather and the bottoms from imported plastic materials. If rubber were produced locally, sponge-rubber sheets could be produced for beach sandals and rubber components of footwear could be produced to replace the import of plastic compounds. It has been adequately established by the studies already carried out that the southern and south-eastern regions of Sierra Leone offer soil and climatic conditions suitable for the production of rubber.

In 1976, the United Kingdom Overseas Development Ministry financed a study (carried out by Tate and Lyle) which resulted in the development of two projects:

(a) A large-scale rubber estate and block-rubber factory at Levuma. The investment cost of this project, designed to establish rubber plantations over 20,000 acres, was estimated to be Le 33.15 million. The project was to yield 10,000 tons of rubber in its twentieth year;

(b) A development programme for smallholders. This project is designed to upgrade the existing rubber estate of 2,610 acres in the public sector into a base for providing technical assistance and common facilities to small landholders in the private sector, covering an area of 17,210 acres. The project includes rubber-processing units for producing ribbed, smoked sheets. The total investment cost of this programme, Le 0.72 million annually, is to be borne by the Government.

Whether these two projects will eventually be implemented with the bilateral assistance of the United Kingdom is not known.

Mention should be made here of an unfinished rubber-goods manufacturing plant in one of the two shoe factories in Sierra Leone. It is proposed that this plant should be completed and the expertise acquired to run this plant. This will make the industrial utilization of the rubber produced at present possible.

Sierra Leone has the potential to emerge as a large-scale exporter of goods manufactured from rubber (such as tyres). It is, therefore, proposed that the projects developed by Tate and Lyle should be considered.

Urena lobata fibre

In 1975, the Commonwealth (Technical Co-operation) Secretariat financed a study to determine the prospects for cultivating this fibre and for using it to produce sacks to replace jute bags. The study established that the prospects were good and recommended that research work should be carried out to prepare a programme for its production and processing. It was proposed that a sack factory might be established by 1985. It was also visualized that, once this factory is established, it would be possible to produce other products such as woven screens, woven floor coverings, hammocks, handbags and hats.

Sierra Leone had already been producing this fibre on a small scale. During 1975, production was only 40 tons. In 1975, the consumption of sacks in Sierra Leone was 1.7 million sacks and it was assumed that this would go up to 4 or 5 million by the year 1985. The value of imported sacks in 1979 was around 1 million leone. The capacity of the proposed sack factory was 3 million sacks per year, for which 5,000 tons of fibre would be required.

It appears that the National Development Bank financed the establishment of the sack factory before research and agricultural-production facilities were established. The attempt has proved unsuccessful. At present, only the premises constructed for this factory are in existence and the entrepreneur is seeking permission to import synthetic material for tailoring into sacks.

It is obvious that the Ministry of Agriculture has not played the role assigned to it by the consultants who carried out the study. Since the economic return of this project is apparently positive and since the demand for sacks is growing because of sugar production, the expected establishment of a fertilizer-bagging plant and the reactivation of the cement plant, it is proposed that priority should be given to the measures required in the agricultural sector to ensure the production of 5,000 tons per year of this fibre by 1985.

Cotton

Sierra Leone at present spends 12% of its total foreign-currency earnings on the import of textiles to clothe its people. The annual consumption of cloth in the Mano River Union market has been assessed as 22 million linear yards and, on this basis, the establishment of a large-scale cotton-textile mill has been considered to be feasible by a UNIDO expert who carried out a study. The cotton requirements for the proposed mill have been assessed at 3,000 tons per year which would require the cultivation of over 9,000 acres of cotton. Cotton is at present produced in Sierra Leone on a small scale and the variety produced is not suitable for the production of quality textiles. In 1975, a study was carried out by an FAO consultant who concluded that although, in general, the climate and soils of Sierra Leone are not ideal for the cultivation of cotton, the prospects for producing cotton in the Northern Province (where rainfall is less) and in the Eastern Province at the end of the rainy season on residual moisture, look promising.

It is proposed that the Ministry of Agriculture should be asked to establish pilot projects in the areas identified. Subject to success on a pilot scale, a plan should then be developed for cultivating cotton over 10,000 acres in the two areas mentioned, to make the establishment of the cotton-textile mill in Sierra Leone a possibility.

Mention should be made here of an investment proposal recently received by the National Development Bank for the establishment of a textile-finishing plant in the first phase, and a textile mill in the second phase, when the production of cotton on the scale necessary for that purpose can be ensured by the Ministry of Agriculture.

IV. THE UTILIZATION OF FORESTRY RESOURCES

A. Potential forestry resources in Sierra Leone

Wood is one of the most important natural resources. Wood products enter widely into the economy at each stage of development and the industries which use wood as a raw material form an important part of the manufacturing sector.

In the fairly recent past, most of Sierra Leone's surface area was covered with trees. At that time, the forestry resources looked inexhaustible. However, the adoption of the bush-fallow system for crop farming and the requirement of land for livestock grazing brought about major changes in the vegetation structure of Sierra Leone and much forest was destroyed by slashing and burning. Those forests remained which were necessary for tribal boundaries.

The forestry resources now available are too small to permit large-scale industrial utilization and their contribution to the GDP at present is only 1.6%. Table 5 in the previous chapter, which gave data on land utilization based on the 1970/71 agricultural survey, shows the position of forestry resources as follows:

	Acres
Forest reserves	705,234
Protected forests	86,168
Total	791,402

The report on the 1970/71 agriculture census also shows that the total area under forest was 1,160 square miles or 3,004 square kilometres, equivalent to a little over 4% of the total surface of the country.

However, forestry resources are not only renewable but can also be expanded. In the nine years after the agricultural census, the situation did not remain static. In June 1979, Atlanta, a firm of consultants from the Federal Republic of Germany was commissioned to assess the forestry resources. The data provided by Atlanta is reproduced below. The difference reflects the growth of area under forest during these nine years.

Total forest area	Square kilometres
Closed high forests	3,743 (5.1% of surface area)
Secondary forests	2,675 (3.6% of surface area)
Total	6,418 (8.7% of surface area)

Forest reserves	Acres
Existing	704,255 (similar to 1970/71)
Protected	189,363 (11% more than 1970/71)
Subtotal	893,618 (12.9% more than 1970/71)
Proposed	83,897
Total	977,515

Standing volume (technical estimate)	Millions of cubic metres
National forests	3.52
Plantations	0.18
Total	3.70
Annual increase in the standing volume	0.06

Use of the wood extracted	Percentage of total
Fuel	95
Construction (round wood)	4
Sawn timber and exported logs	1
Total	100

It can be seen from these figures that, although forestry resources have expanded, the growth has only been achieved in the area under protected forests. The average annual increase in the total area under forest so far achieved is only 1.43%.

The six main forests are Tama, Tonkolili, Kangari, Gola North, the eastern forests and the western forests. Studies have been carried out to determine the prospects for establishing sawmills to exploit the Tama, Tonkolili and Gola forests. These reports provide data on the resources available, timber extraction and sawmill capacity.

B. Sawmill capacity and its utilization

The sawmill industry is fairly developed and there are as many as five plants operating in the modern sector of industry. In addition, there are reported to be 100 pit sawyers operating in the country. Each sawmill holds a concession to exploit a specific area in one or the other forest. The pace of logging operations and that of the production of sawn timber in the mills is shown in tables 8 and 9.

Table 8. Volume of timber extracted from forests
(cubic metres)

Sawmill concession	Production years					Expected future production
	1974	1975	1976	1977	1978	
Forest Industries Corporation	13 200	13 400	13 500	5 700	8 000	23 400
Panguma sawmill	11 500	8 800	7 600	10 200	11 000	13 600
Sileti sawmill	-	2 400	9 700	22 300	30 000	54 000 a/
Kasewa sawmill	1 200 b/	1 200 b/	1 200 b/	500	500	2 200
Hangha sawmill	-	-	-	-	1 000	2 200
Total	25 900	25 800	32 100	38 700	50 500	95 200

Source: Feasibility study for the Timber Industry Complex, Kenema. Carried out by Atlanta Industrie-und Unternehmungsberatung Gmbh. (Hamburg, May 1978).

a/ 42,000 m^3 sawmill input and 12,000 m^3 log exports.

b/ Estimates.

As will be seen from table 8, the volume of logs extracted annually from the forests has gone up by almost 100% over a period of five years (1974-1978). When the new project planned by Atlanta is realized, the production of logs is expected to double again. On the other hand, the production of sawn timber has not gone up over a period of seven years (1972-1978), as is clear from table 9.

Table 9. Production and consumption of sawn timber
(cubic metres)

Production	Production year			
	1972	1974	1976	1978
Modern sawmills	12 000	14 000	12 300	12 500
Pit sawyers	8 400	8 400	8 400	7 560
Subtotal of production	20 400	22 400	20 700	20 000
Imports	800	1 600	900	1 000
Total supply available	21 200	24 000	21 600	21 060
Exports	-	-	800	-
Net amount available for local consumption	21 200	24 000	20 800	21 060

Source: Feasibility study for the Timber Industry Complex, Kenema. Carried out by Atlanta Industrie-und Unternehmungsberatung Gmbh. (Hamburg, May 1978).

C. The Forest Industries Corporation

The development and exploitation of forestry resources is almost entirely in the hands of the public sector, operating through the Forest Industries Corporation which was established long before independence. The Corporation has had time to acquire experience and develop skills, and has emerged as the largest employer in the industrial sector. However, the Corporation has had certain difficulties. It has not been able to form capital for development and has for a long time only just been breaking even. It has also to spread its resources over many related fields such as the exploitation of forests, the development of primary industries (producing sawn timber, poles and cross arms, mouldings etc.) and of secondary industries (producing furniture, wood-based handicrafts and the like). The public sector is not really suitable for the development of secondary industries. Had the Corporation concentrated exclusively on the primary industries, this would have been helpful to the development of secondary industries in the private sector.

The Corporation is now engaged in planning the optimum use of the financial assistance provided by the Federal Republic of Germany. It is clear that the flow of this assistance will result in the expansion of the Corporation's capacity for both extraction and production andtthis in turn will cause problems of:

(a) Working capital, the need for which will be heavy (the Atlanta estimate of Le 400,000 appears to be on the low side);

(b) Marketing, particularly the export of production surplus to internal-market requirements.

However these problems are tackled, it is hoped that the expansion of the Corporation's activities through this assistance will result in the growth of wood-based industries and the export of wood products.

The Corporation, at present, produces mostly to meet Government demand for furniture and wood products. It is not, however, an ideal marketing policy for a Corporation of this size to tie its production programme to the requirements of Government, particularly when only small amounts of each item are needed. The Corporation should operate on the principles of mass production in order to reduce its production costs and become competitive in export markets. The Corporation's success will eventually depend on serial production of exportable items and of primary products in demand by local industries in the private sector.

D. Products of primary industries

Primary industries produce materials and intermediates to facilitate the manufacture of secondary industrial products such as furniture, handicrafts, paper and board. The primary products based on forestry include:

Sawn timber
Wood-based panels
Pulp
Charcoal

These are discussed in the paragraphs that follow.

Sawn timber

Sierra Leone has developed a sizeable timber-sawing capacity based on five modern sawmills. The installed capacity of these mills is not at present being fully utilized due to the shortage and uneveness of intake supplies. The full utilization of this capacity largely depends on:

(a) The pace of logging operations;

(b) A more homogenous supply of logs for intake;

(c) The development of the domestic market;

(d) The acquisition of an export market for sawn timber;

(e) An improvement in the economics of sawmilling through making a profitable use of sawmill waste.

It is visualised that, with the replacement and improvement of logging and transport equipment under the Atlanta project, the intake supply for the sawmills of the Forest Industries Corporation will improve. There is, at present, no prospect of a homogenous intake in Sierra Leone. As is shown in table 9, the internal demand for sawn timber has partially to be met by imports equivalent to 5% of the present production of the sawmilling industry.

These imports could easily be replaced by local production. It should also be possible to ensure the development of a domestic market for sawn timber through product development and other measures. The Corporation has plans for this. As regards (d) above, prospects for exporting sawn timber are promising. It would, however, be necessary to control production costs. A look at the parameters of this industry indicate that the cost of logs delivered to the mill should represent 50-70% of mill-production costs. One cubic meter of sawn timber requires around 15 man hours of labour. If these two factors are controlled by the management of the Corporation, the economics of the sawmills will improve. The sawmill industry could be made even more competitive by making a profitable use of sawmill waste. Around 30-40% (in Sierra Leone 40-65%) of the raw material entering a sawmill emerges in the form of slabs, edgings and sawdust. In developed countries, the slabs and edgings are chipped for pulp and board production. The Forest Industries Corporation has a plan to use its sawmill residue for the production of steam and electricity. How and when this plan will be implemented is not known. Pulp and board production are discussed below. In general, the economics of a sawmill depend upon controlling the amount of waste and putting it to the best use, and also on the production of quality timber in the dimensions required by the overseas market.

Wood-based panels

The consumption of sawn timber is declining in both the furniture and construction industries and its place is being taken by panels. These panels require plywood, firbreboard and particle board and are not, at present, produced in Sierra Leone.

It will therefore be necessary for the Forest Industries Corporation to develop a basis for the production of panels by promoting the establishment of plants to produce plywood and particle board.

The prospects for a plywood plant in Sierra Leone look very promising. The market for wood-based panels in Sierra Leone was assessed by Atlanta on the basis of imports of plywood, particle board and fibreboard as follows:

1976	4,000 cubic metres
1985 (projection)	6,400 cubic metres

This does not include demand in the other two countries of the Mano River Union, i.e. Guinea and Liberia.

The feasibility of a plywood plant has been established not only by Atlanta but also by a Romanian study. The capacity proposed by the former is 2,000 cubic metres and by the latter 6,000 cubic metres. The establishment of this plant in the near future depends on its inclusion in the project finally accepted by the Federal Republic of Germany for that assistance it is giving to the Forest Industries Corporation.

If the capacity of the plant finally chosen is 6,000 cubic metres, it will be necessary to export plywood and this will require production at competitive prices. In attempting to control costs, the following universal parameters should be kept in mind:

Investment cost	up to $US 200 per cubic metre of annual capacity
Cost of input logs as a proportion of manufacturing costs	30-50%
Conversion losses	50-70%
Consumption of adhesives (imported)	25-35 kilogrammes per cubic metre of plywood
Labour costs	100 man hours per cubic metre

It might be useful to diversify by introducing the production of block board and laminated board. In fact block board is included in the broad category of plywood and is considered as a branch of plywood production. This would require the import of particle board if not produced locally.

Present demand for particle board, assessed on the basis of imports, does not seem to justify the establishment of a particle-board plant. Such a plant has, therefore, not been included either in the Atlanta project or in the studies carried out by the Romanians in 1976. Nevertheless, the Corporation considers a particle-board factory worth consideration. Such a plant would ensure the utilization of sawmill residues. Its water needs would be minimal and power requirements modest (100-300 kilowatts per ton of board). The labour requirements are also modest. The bonding material required is only 7% of the weight of the finished board. The advantage of this plant would be an improvement in the domestic value added of block board. It is, therefore, proposed that this project should remain under constant consideration.

Pulp and paper

A UNIDO expert has established the feasibility of a 20-ton-per-day paper and board mill based on rice straw (80%) and imported wood pulp (20%). He did not favour the production of wood pulp locally because of the lack of homogeneity of the logs which can be extracted from the forests.

The Ministry of Agriculture and Forests has supported the project subject to the design of the pulp mill being modified to enable possible production of wood pulp at a future date.

The Forest Industries Corporation has proposed the establishment of a plantation of short-cycle trees (such as poplar) for pulp production. Both the proposals are in the right direction and should be considered when the project to be included in the mid-term programme is designed in detail.

Charcoal production

As already stated, 95% of the wood extracted from the forests is at present used as fuel. To bring about a reduction in the consumption of wood for fuel, the Ministry has requested UNIDO to provide the services of a short-term consultant to develop a project for the production of charcoal and charcoal briquettes from agricultural waste and the thinnings left over in the forests.

E. Products of secondary industries

In Sierra Leone these include furniture, wood-based handicrafts and construction. Four per cent of the wood extracted from the forests is at present used in the construction industry. It has been suggested above that the Forest Industries Corporation should restrict its role to:

(a) The production of primary products such as sawn wood, plywood, particle board, block board, mouldings, poles etc;

(b) The provision of design and technical assistance facilities to promote the growth of secondary industries in the private sector.

If this is accepted, it would be feasible to transfer the joinery shop and handicraft-production units to the private sector.

However, if this is not considered desirable, the best course for the Corporation would be itself to develop serial production lines for large-scale manufacture and to leave those items of furniture which are in demand in small quantities for production in the private sector.

F. Enterprises in the private sector

There are three companies in the private sector which hold concessions for extracting timber for their sawmills. These should also be geared to play an effective role in the development of wood-based industries. In particular, each mill should be given a target to export annually a specified amount of sawn timber and to produce at least one additional primary product for local use, such as particle board, charcoal, furniture components, components used in housing construction, rural bridges etc.

V. THE UTILIZATION OF FISHERY RESOURCES

A. Assessment of Sierra Leone's fishery resources

It is surprising that a country like Sierra Leone with enormous fishery resources is still a net importer of fish. The value of average annual fish imports amounts to Le 7 million. This is partly due to the high per capita consumption (20 kilogrammes) since fish is the main source of protein in the common diet. Consumption of fish in 1978 was 68,000 tons and expert estimates indicate that annual fish consumption will go up to 100,000 tons by the end of the next decade.

A number of studies have been carried out to assess the country's fish potential. Of these, the most significant for the assessment of potential fishery resources for industrial utilization are as follows:

(a) An Italian study carried out in 1974 by Propesca;

(b) The UNDP/FAO study carried out in 1975 by the Norwegian Agency for International Development;

(c) The FAO/Norwegian Corporation Development Programme study on Sardinella resources and prospects for its exploitation (1978);

(d) The Union of Soviet Socialist Republics (USSR) assessment of Sierra Leone's fishery resources.

It is confirmed by all these studies that Sierra Leone has a potential catch of around 250,000 tons of edible fish annually. The study at (c) above further indicates that coastal purse-seining alone has the capacity to yield 50,000 tons of sardinella annually. This study also gives basic data on Sierra Leone's fish resources as follows:

Length of coastline	405 kilometres
Width of continental shelf	15.8 nautical miles
Extent of territorial waters	200 nautical miles
Number of fisherman in operation	10,000
Domestic landing of fish per year	60,000 tons
Landing by locally-registered foreign vessels	2,500 tons

All the studies mentioned above presented programmes to develop and exploit the available resources. Those presented in the first three studies were not approved by the Government. The USSR study provided a base acceptable to the Government for future planning to develop the fisheries sector. The

resource-assessment data offered by the USSR study has been organized into table 10.

Table 10. Potential fish resources and proposed annual target catch
(thousands of tons)

Type of fish	Possible catch per year	Proposed annual target catch		
		Coastal shelf	High seas	Total
Edible fish				
Pelagic species	120	56	20.7	76.7
Bottom species	50	14	29.2	43.2
Crustaceans	2	—	1.7	1.7
Subtotal	172	70	51.6	121.6
Inedible fish	80	-	8.4	8.4
Total potential per year	252	70	60.0	130.0

A perusal of this statement will indicate that according to the assessment made by Soviet experts, Sierra Leone has a potential catch of 172,000 tons of edible fish annually.

The same study also proposes various development targets. These targets require the gradual development of facilities to enable Sierra Leone to take an annual fish catch of 70,000 tons on the coastal shelf and 60,000 tons on the high seas, making a total of 130,000 tons. This target catch would consist of 121,600 tons of edible fish and 8,400 tons of inedible fish.

The achievement of this target requires a huge investment in the creation of infrastructure facilities, the establishment of a national fleet of trawlers and shrimpers and a legal and institutional framework to provide training, research and development facilities. The industrial utilization of the fish caught through the establishment of canneries, the production of fish meal, fish oil etc., would be possible only after the resource is adequately developed and supplies of fish in the quantities required by industrial plants are ensured.

B. The Sierra Fishing Company

As a first step towards achieving the proposed target, the Sierra Fishing Company, a pioneering national enterprise of great significance, has been established. This company has entered into three different agreements with Sovrybflot, the Soviet state fishing fleet.

These agreements entitle the company to receive:

(a) A monthly supply of 1,000 tons of fish from the Soviet fleet in Sierra Leonean waters for processing and sale;

(b) Thirty per cent of the shrimp catch of two Soviet trawlers equipped as shrimpers;

(c) The right to market frozen fish from the Soviet fleet in Sierra Leone's internal market.

The second step will be to develop a national fishing fleet to replace the foreign trawlers and companies at present operating in Sierra Leonean waters.

C. Legal infrastructure

The Fisheries Act of 1965 and the regulations enforced thereunder are designed to regulate activity in the industrial fishing sector. At present, it is overwhelmingly foreign companies and foreign fishing vessels which are engaged in this field.

This act requires all fishing vessels operating in Sierra Leonean territorial waters (excepting artisanal fishing boats) to be registered on payment of a nominal annual registration fee, and thereafter to pay a royalty on the gross tonnage of the fish caught (whether landed in the country or not). Tables 11, 12 and 13 give a summary of the provisions of this law to indicate how little revenue the country is earning from the fishing activities of foreign companies.

Table 11. Registration fees payable by fishing vessels

Vessel size (length in feet)	Yearly fee (leone)	Quarterly fee (leone)
Below 20	10	-
20	15	4
21 to 40	30	8
41 to 60	60	16
61 to 80	90	24
81 to 100	120	32
101 to 120	150	40
121 to 140	180	48
141 to 160	200	53
161 to 180	240	64
181 to 200	270	72
201 and above	300	80

Table 12. Royalty payable on fish catch

Gross tonnage of fish caught (tons)	Yearly per ton (leone)	Half-yearly per ton (leone)
15 to 49	2.00	1.60
50 to 99	1.50	1.25
100 to 1 000	1.25	1.00
over 1 000	1.00	0.75

Table 13. Royalty payable on shell fish

Gross tonnage of fish caught (tons)	Yearly per ton (leone)	Half-yearly per ton (leone)
15 to 49	8.00	5.00
50 to 99	6.00	4.00
100 to 1 000	4.00	2.50
over 1 000	3.00	2.00

The Government is conscious of the need to make the fishery law development oriented and, for that purpose, a new draft is being prepared with the assistance of FAO.

The present situation is one which makes possible the large-scale exploitation by foreign trawlers of Sierra Leone's fishery resources on payment of a nominal royalty. The scale of this can be guaged from the following data:

(a) There are three Italian fishing companies which together own seven fishing vessels operating in Sierra Leonean territorial waters. The fish caught is not landed but is declared for the payment of royalty;

(b) The size of the Soviet fishing fleet in Sierra Leonean waters can be estimated from the fact that during six months of its first year of operation (1978), this fleet declared a catch of 40,000 tons of fish. Under the agreement with the Sierra Fishing Company, the Soviet fleet is required to land 1,000 tons of fish monthly for sale to the company. This amount has since been doubled;

(c) In addition to the above, there are 21 other registered foreign trawlers who are engaged in fishing in the territorial waters of Sierra Leone. The catch landed on the coast for local sale is marginal.

In brief, the situation is that Sierra Leone's fish resources are at present being exploited by foreign trawlers and companies and Sierra Leone is importing fish to meet the consumption requirements of its own people.

D. Other infrastructure facilities

Sierra Leone is moving gradually from artisanal to industrial fishing The interim situation is distressing. The operations of foreign trawlers and companies, on the scale described, have resulted in a decrease in the catch of fish by the artisanal fishing boats belonging to nationals of Sierra Leone. To develop the local industrial fishing sector and to replace foreign trawlers and companies, a huge investment is required in the creation of infrastructure facilities.

To start with, there is no fishing harbour in Sierra Leone. It is learnt that the Commonwealth Fund for Technical Co-operation (CFTC) will finance the construction of such a harbour as a part of its 10-year assistance programme.

The coastal guard is inadequate and its capacity to control fish piracy is limited.

There is no training and research institute to develop skills or to provide the information service needed by fishing trawlers on the high seas.

ECOWAS plans to develop a regional project to exploit the common fishery resources of West Africa.

E. Future plans of the Sierra Fishing Company

The future of the fisheries sector lies in the hands of the Sierra Fishing Company. Its success in taking over the exploitation of national fishery resources from foreign companies and developing fish-based industries will depend on the speed with which the company can generate investment finance for that purpose.

The company was established in 1976 with an authorized capital of Le 1 million and a paid-up capital of only Le 100,000. It has now unfolded its expansion plans which require an investment of Le 8.45 million over the period 1981 to 1983. Of this, 20% (Le 1.69 million) will be contributed by the existing partners as equity and the balance (Le 6.76 million) will be arranged through a foreign financing institution in French francs as follows:

(a) F 10 million at a preferential interest rate of 3%;

(b) F 18.44 million at an interest rate of 13%.

The period of repayment in both the cases is 15 years starting from the fourth year of the project. The partners in the equity of this company are as follows:

	Percentage of equity capital
Government	25
Fransor S.A.	20
National Development Bank	10
Nationals of Sierra Leone	45
Total	100

The company's activities cover the entire field of coastal and deep-sea fishing, fish freezing, processing, packaging, storage and distribution for internal marketing and export.

The facilities already developed by the company include four jetties of which one is 75 metres long, twelve cold stores with a total capacity of 2,500 tons, one 30-ton ice plant and one fish-processing plant.

In addition, the company now operates 10 shrimpers of which five double-rigged shrimpers were obtained under charter from the Liberian company, Mesurado, and the remaining five were bought by the company in 1980 out of its own resources. The company now plans to buy and operate five stern trawlers each 25 metres long as well as two seiners each 25 metres long. In addition, the company is adding to its existing freezing capacity an air-blast freezer with a load capacity of 160 tons.

As is evident, the emphasis is on the replacement of foreign fishing vessels by a national fleet. Possible industrial developments would be fish canning and the production of fish meal and fish oil.

Prospects for a fish-canning industry

The viability of establishing a cannery for sardinella has been confirmed by more than one consultant, but the establishment of such a cannery, based on the catch of foreign trawlers and companies, has not been considered appropriate.

The approach formulated and followed by the Sierra Fishing Company, namely first to develop its own fleet of vessels to replace the foreign vessels appeals to reason and is fully supported.

It is, therefore, not foreseen that a fish-canning plant will be established in Sierra Leone in the near future.

Fish meal and fish oil

Fish meal and fish oil are produced from low-quality fish and offal available from a fish-processing plant. The Sierra Fishing Company has a processing plant but the amount of offal yielded by this plant is not known. Normally, this is up to 40% of the fish processed.

The Sierra Fishing Company should investigate the possibility of using offal and low-quality fish for the production of fish meal and oil.

F. Integrated Fish Meal Industry Limited

This was incorporated in 1977 as a private limited company to produce fish meal and fish oil from low-quality fish. Having started with the production of end-products, the company has discovered that, unless it develops its own fleet of vessels and produces sole fillets for export, success may not be achieved.

Plans for expansion have now been produced. Currently, the company has three trawlers. The number is likely to go up to five in 1980. This will enable the company to increase its catch from 3,750 tons to 6,250 tons per year. In addition, the company proposes to use one trawler for catching sole. Its production will be around 200 tons annually. Apparently, the company is not at present concentrating fully on the production of fish meal and oil. This will be more feasible after a capacity for the production of raw materials (low-quality fish and offal) is developed.

G. Boat-building, repair and service facilities for fishing vessels

Sierra Leone has a boat-building yard which requires modernization and expansion. This would assist the development of the artisanal fishing sector. Prospects for producing boat hulls from glass fibre should be explored. Glass fibre can be produced locally for a variety of uses other than boat-building. Other uses could include production of irrigation and drainage pipes for agriculture and sanitary ware. Glass sand of good quality is available in abundance. It is also necessary to develop facilities for the servicing and repair of fishing vessels.

H. Inland fishing

Sierra Leone has an enormous potential for inland fishing. This resource is at present only marginally exploited. If this resource were fully developed for food, it would be possible to use the coastal-shelf and deep-sea resources for developing export industries based on fish-processing.

I. Concluding remarks

Sierra Leone has developed a base for growth in fish utilization. However, there is still a need to accelerate the pace of development of infrastructure facilities, training and research activities and, last but not least, a national fleet of trawlers and vessels to replace the operations of foreign companies.

All activity in this sector should be aimed at achieving self-sufficiency, including the canning of sardinella and tuna for export, the expansion of the fish-freezing and processing capacity for export and the production of fish meal and oil from offal and low-quality fish. The Sierra Fishing Company should be given full support and guided to develop fish-canning, fish-meal and fish-oil industries.

I. THE UTILIZATION OF LIVESTOCK RESOURCES

Livestock resources provide a base for the development of a large variety of primary and secondary industries. Primary products include fresh, chilled and frozen meat for human consumption, meat for pets, edible and inedible offal, fresh, pasturized and sterilized milk (bottled, canned or packed), tanned leather, rendered fat (refined and processed), blood and bone-meal and intestines. The secondary products include a variety of canned meat products, milk products such as reconstituted milk, powdered milk, evaporated or condensed milk, cheese, butter and allied products, leather goods, particularly footwear, basic pharmaceuticals, poultry and animal feed, catgut and neats-foot oil.

A. Prospects for industrial development based on livestock resources

In a country where livestock production is surplus to local consumption, the problem is that of converting the surplus into exportable meat and dairy products to obtain optimum value. But in a country like Sierra Leone, where both livestock on the hoof and livestock products are imported, the problem is not so simple. A detailed study is required to investigate the possibility of:

(a) Supplementing pasture resources by cultivating fodder and producing livestock feed;

(b) Replacing beef and mutton consumption by that of poultry and fish whose production can be increased faster;

(c) Replacing beef consumption by mutton if sheep and goats can be conveniently raised in larger numbers;

(d) Establishing integrated agro-industrial projects to boost meat and milk production;

(e) Using modern technology, management, marketing and financing skills to reduce the import liability for livestock and related products.

A detailed study of these aspects of the problem would require much time and space, but an attempt will be made in this chapter to identify the most viable options open to Sierra Leone.

B. Livestock population

The contribution made by the livestock sector to the national economy of Sierra Leone is at present only 1.6%. This, however, compares favourably with the situation in 1923 when it was reported in the records of the Forest Department that, "The colony and towns of the protectorate are dependent entirely on French Guinea for the supply of cattle required for consumption".

After independence, Professor R.W. Touch Berry, who arrived under USAID to help Sierra Leone plan its Animal Husbandry Station at Musaria, reported that 30-35% of the cattle slaughtered were produced in Sierra Leone at that time.

Livestock population data for 1970, 1974 and 1979 are presented in table 14.

Table 14. Livestock population, 1970-1979
(thousands)

Year	Cattle	Sheep	Goats	Pigs	Poultry
1970	250	57	156	29	2 912
1974	280	64	168	34	3 162
1979	330	104	274	15	3 400
Increase over 1970 (percentage)	32	82	43	-93	14.70
Average annual growth (percentage)	3.5	9	4.8	-10.3	1.66

As will be seen, things had progressed very far by June 1979 when Technical Services Limited of the United Kingdom carried out a study on livestock development and reported the figures for livestock population which are given for 1979 in the table.

Table 15 provides projected data on livestock population assuming that it will be possible to maintain the annual growth rate as reflected in table 14.

Table 15. Projected livestock population, 1980-1985, at the annual growth rate shown in table 14 (thousands)

Year	Cattle	Sheep	Goats	Pigs	Poultry
1980	334	113	287	-	3 401
1981	337	123	301	-	3 458
1982	341	134	315	-	3 515
1983	344	147	330	-	3 578
1984	356	160	346	-	3 633
1985	368	174	363	-	3 693

The National Plan (1974/75-1978/79), however, struck a pessimistic note by stating that prospects for livestock development are limited by "breeding capacity" and the lack of success in controlling animal diseases. The plan recommended an annual target of meat production of 2,000 tons to be achieved during the plan period.

C. Meat consumption in Sierra Leone

Studies carried out by experts in the past provide the following varying estimates of per capita consumption of meat:

	Kilogrammes per capita
(a) Estimate of Dr. Josip Sever (1967)	
Projection for 1975 (low)	4.3
Projection for 1975 (high)	5.0
(b) Dr. Halliday's report on the Animal Feed Industry (1975)	3.7
(c) National Plan (1974/75-1978/79)	4.9
(d) Estimate formed by Technical Services Limited (1979)	3.7

Consumption of meat grows with the process of urbanization and with increases in per capita income. Although urbanization has taken place in Sierra Leone, per capita income in real terms has declined. In the circumstances, it is assumed that per capita consumption of meat has remained static.

In table 16, data on production of meat from local livestock in 1979 is provided. This shows that 7,323 tons of meat were produced. In table 17, data on the actual consumption of meat in 1979 is given.

Table 16. Meat production from local livestock in 1979

Livestock	Population (number)	Offtake (number)	Offtake (percentage)	Average live weight (kilogrammes)	Meat per carcass (kilogrammes)	Total meat production (metric tons)
Cattle	330 000	23 000	7	180	126.00	2 898
Sheep	104 000	20 800	20	25	13.75	286
Goats	274 000	68 500	25	20	11.00	754
Pigs	15 000	7 500	50	68	50.00	375
Chicken	...	4 300 000	...	1	0.70	3 010
Total meat production in 1979						7 323

Source: Based on the data provided in the report of Technical Sercices Ltd.

Table 17. Type and source of meat consumed, 1979

Type of meat	Total consumption (metric tons)	Total consumption (percentage)	Local production (metric tons)	Local production (percentage)	Imports: Production from Guinea livestock (metric tons)	Imports: Meat (metric tons)	Imports: Total (metric tons)	As percentage of total consumption
Beef	6 425	57	2 898	40	3 127	400	3 527	54.79
Mutton and goat	1 255	11	1 040	14	215	-	215	17.15
Pork	575	5	375	5	-	200	200	65.21
Chicken	3 010	27	3 010	41	-	-	-	-
Total	11 265	100	7 323	100	3 342	600	3 942	34.99

It is clear from table 17 that between total consumption of meat (11,265 metric tons) and local production of meat (7,323 metric tons) there is a short fall of 3,942 metric tons which is made up by importing both livestock and meat. Sierra Leone is therefore dependant on imports for up to 35% of its total meat requirements.

It is also clear that Sierra Leone is self-sufficient only in the production of poultry. Dependence on imports in the case of beef is as high as 54.79% and of pork 65.21%. Only 17.15% of mutton and goat meat is imported. It does not appear easy to eliminate meat imports completely in the foreseeable future.

The first question to be considered, however, is whether it is necessary for Sierra Leone to achieve self-sufficiency in meat. Sierra Leone has an acute and chronic balance-of-trade problem to which the contribution made by the import of Guinean cattle is very large, more than 10%. This issue is briefly examined in the following paragraph.

D. Assessment of the import liability for Guinean cattle

Sierra Leone at present pays for Guinean cattle in local currency and does not feel the pinch. But, in actual practice, the local currency earned by Guinean herdsmen is used for buying imported goods from Sierra Leone for transfer to Guinea. Thus, indirectly, Sierra Leone pays for Guinean cattle in hard currency. Secondly, the sale price of Guinean cattle has been growing and on the basis of the data available it is presumed that this will continue to grow at 10% per year on average. Thirdly, it is assumed that the consumption of beef would decline from 1980 to 1985 due to its replacement by mutton and poultry. The results of these calculations are presented in table 18.

Table 18. Projected import of cattle [a/]

Year	Meat consumption (metric tons)	Beef consumption (metric tons)	As a percentage of total	Cattle requirements (number)	Expected local offtake (number)	Expected imports (number)
1979	11 265	6 425	57	51 000	23 000	28 000
1980	11 535	6 517	57	51 722	23 386	28 336
1981	11 811	6 555	56	52 023	23 461	28 562
1982	12 095	6 652	55	52 793	25 318	27 475
1983	12 385	6 687	54	53 071	26 078	26 993
1984	12 682	6 594	52	52 333	26 860	25 473
1985	12 987	6 493	50	51 531	27 664	23 867

a/ Assuming that meat consumption grows with the population growth rate at 2.4% per annum but that the share of beef in total consumption goes down from 57% to 50% between 1980 and 1985.

The value of the expected imports of Guinean cattle up to 1985 is shown in table 19.

Table 19. Value of projected imports of Guinean cattle

Year	Project imports of cattle (number)	Average price per head (leones)	Import liability (millions of leones)
1979	28 000	400	11.20
1980	28 336	440	12.46
1981	28 562	484	13.82
1982	27 475	532	14.61
1983	26 993	585	15.25
1984	25 473	644	16.40
1985	23 867	708	16.89

As will be seen, despite an expected decline in the import of cattle from Guinea, the value of imports is bound to go up from about Le 11.20 million in 1979 to Le 16.89 million in 1985. This makes it necessary for Sierra Leone to try and achieve self-sufficiency in meat production.

E. A policy for self-sufficiency

To attain self-sufficiency in meat production, Sierra Leone has to initiate and maintain a development programme over a long period. This programme has to be aimed at increasing the growth rate of the cattle population, improving the offtake of cattle and fattening cattle prior to slaughter to obtain a higher yield of meat per head. Another possibility is to replace some of the beef consumed by mutton and poultry. It is possible to achieve an improvement in all these factors through proper planning.

Livestock population growth rate

It is possible to increase the growth rate of the cattle population by making optimum use of pastures and supplementing pasture resources by fodder crops and animal feed. The data in table 14 show that while the annual rate of livestock population growth from 1970-1974 was only 3%, from 1974-1979 it was 3.75%. It is therefore clearly possible to improve the rate. An increase of only 1% in the cattle population would mean 30 tons of beef more per year, 238 less Guinean cattle imported and a saving of around Le 100,000 in foreign currency.

Offtake

At present, only 7% of the cattle population matures for slaughtering. This is a very low offtake rate. Even in developing countries, this rate should be between 9% and 10%. If offtake were increased by 1%, this would mean 420 tons of beef more from local cattle and 3,335 less Guinean cattle would need to be imported.

Meat recovery

The present meat recovery per beef carcass of average size is 126 kilogrammes. If this were raised by only 1%, this would mean 30 tons more meat per year.

Possibility of replacing beef by mutton and poultry

Another way is to multiply the production of mutton. The composition of meat consumption has been changing gradually because of sheep, goat and poultry development. It is foreseen that consumption of beef will automatically come down from 57% of total meat consumption to 50% in a period of about 10 years. But if a greater emphasis is laid on poultry and mutton production, the import of Guinean cattle will come down much earlier. This is providing the present rate of per capita meat consumption remains steady.

F. Resources of pasture and problems of grazing

A major factor in the development of the livestock population in Sierra Leone is the amount of pasture available.

It is on the north of the interior plateau that the major livestock breeding areas lie. The flat grasslands of this area offer the best grazing grounds. In addition, 30% to 40% of the wooded slopes are ideal for grazing. The interior plains are the next in importance and offer range grazing. The capacity of this is, however, limited. Grazing is not possible during the wet season. The coastal swamps and the southern peninsula include alluvial grassland for grazing in the wet season and open grassland on the slopes of the peninsular hills.

The capacity of the grazing resources has not so far been assessed, nor is there any administrative machinery in Sierra Leone to ensure the optimum management and use of this resource. There is, however, no disagreement on the point that optimum utilization of meadow and pasture is not being made.

The problem of range-land grazing is that at certain places there is no grass during the dry season and at other places excessive swampiness does not allow grazing during the wet season. Consequently, there are lean periods everywhere and the herdsmen have to move the stock from place to place to find vegetation. The solution to this problem lies in the cultivation of fodder, use of the feed-lot system and the development of an animal-feed industry. It is true that herdsmen are not used to such practices and might resist when these are introduced. To deal with this situation, it might be feasible to subsidize fodder and animal-feed production during the initial stages.

G. Livestock breeds popular in Sierra Leone

Meat production also depends upon the breeds of livestock and their suitability to the environmental conditions. The breeds suited to local conditions and reared in Sierra Leone are as follows:

(a) Cattle. The only breed found in Sierra Leone is N'dama which is raised all over West Africa. The breed originated in Morocco and is said to have been developed through crossing. N'dama is a poor milker but a good meat producer. N'dama is capable of withstanding the hazards of the dry season, humidity and parasites;

(b) Sheep. West-african dwarf is the only variety raised in Sierra Leone. Sheep, because of their small size, are not considered to be a good source of meat. But, because of its very high growth rate, emphasis on sheep production has to continue;

(c) Goats. The dwarf variety popular throughout West Africa is also raised in Sierra Leone. This is a well-established breed for meat production. The data given in table 14 reflect the growth rate of the livestock population.

H. Research and development activities

Conventional means do not offer a short cut to solving the problem. They aim at bringing about a gradual change in animal-husbandry practices, improvement in veterinary services and in the breeds reared. This conventional approach offers a sure but very long-term solution. Sierra Leone has so far followed this approach and obtained results.

Despite the absence of a livestock-development programme in the National Plan (1974/75-1978/79), the Ministry of Natural Resources (Animal Husbandry Division) appears to be an active and dynamic organization. There are as many as seven livestock-development projects located at Roruks, Njala, Newton, Waterloo oil-palm plantations (for milk cattle), Kenema and Musaria. In 1953,

a project was established to settle cattle herdsmen in the district of Koinadugu. In the same year, a cattle-fattening project was established at Gbundapi. There are veterinary dispensaries located in the field to control disease. Not much information is available in this field. Pilot projects have been established for producing animal feed at Njala and poultry-processing and piggery development at Freetown. Two modern abattoirs are now under construction of which one is in Freetown.

I. Re-organization of the livestock industry on modern lines

The answer to Sierra Leone's problems in this field lies in the adoption of modern animal-husbandry practices, modern marketing and butchery techniques and development of fodder and animal-feed industries. To quote the opinion expressed by an expert on the animal-husbandry practices followed in Sierra Leone;

"It is not good economics or husbandry management to take three years to grow an animal to an acceptable market weight when it can be done in one half or two thirds of that time with supplemental feeding in the dry period. There is an economic loss of extra labour, feed for maintenance, medical costs and death losses concomitant with the longer period required for reaching the market weight. If Sierra Leone is to have an economically healthy cattle industry, it must grow crops to produce feed to supplement pastures."

It is difficult to disagree with this view. As already mentioned, the main obstacle to the adoption of the approach recommended is likely to be resistance from the herdsmen. In developing economies, cattle raising, like agriculture, is a way of life and a cultural change has to precede the desired economic change. Another problem in Sierra Leone is that of the land-tenure system which is overwhelmingly communal and may make the procurement of land for the establishment of fodder farms difficult. These problems have been faced in some other African countries by modernizing and re-organizing on the following lines:

(a) Purchase of one-year-old cattle from herdsmen for rearing and fattening on ranches which may be set up in suitable areas either under private or public ownership;

(b) Establishment of a model fodder farm on each ranch and also purchase of fodder from outside growers who are advised and assisted by the ranch management in the production of fodder;

(c) Establishment of an animal-feed unit based on local materials and suited to the type of meat production on each ranch;

(d) Establishment of a modern abattoir attached to a ranch, equipped with facilities such as insulated vans for transporting the meat produced to the market towns for sale (these need not be established on all ranches);

(e) In cases where an abatoir is established on a ranch, a plant for processing by-products is also established to produce blood and bone-meal etc as raw material for the animal-feed plant.

J. Poultry production

Commercialization of existing efforts in this field requires:

(a) The establishment of one commercial-scale hatchery in each province supported by:

(i) A parent stock farm;

(ii) Extension services to help farmers plan and establish commercial-scale poultry farms;

(iii) A credit-assistance programme to be organized through the National Development Bank.

(b) The replacement of imported material for poultry feed by local materials through setting up a short-term research project to evaluate the economics of poultry production based on alternative feed formulas and to develop these for final selection;

(c) The encouragement of the poultry-products trade by granting import licences for freezers and roasters.

An initial hatchery could be established in town. Once the capacity is fully utilized, this would sell one-day-old chicks to the poultry farms in the provinces. As and when a sufficient market is created in each province, a hatchery unit should be established in that province with the supporting facilities mentioned above.

K. Conclusion on meat production

It is desireable and possible for Sierra Leone to attain self-sufficiency in meat production by dovetailing conventional and modern methods in the development of agro-industrial integrated projects for cattle, sheep and poultry development based on local resources. It would be feasible to attract private enterprise into such ventures with or without government participation. Private enterprise would be eligible for tax incentives.

L. Milk production

Sierra Leone is not expected to start producing milk in commercial quantities in the foreseeable future. The existing breed of cow is a poor milker and the development of a breed suited to local conditions for milk production would take a long time. Table 20 shows that, at present, Sierra Leone imports milk and milk products to the value of around Le 4 million annually.

Table 20. Cost of imported milk and milk products
(leones)

Items imported	1976	1977	1978 (6 months)
Tinned milk and cream	170 638	120 864	63 370
Dry milk and cream	1 429 635	1 674 589	558 783
Fresh milk	1 725 746	1 653 217	603 645
Butter	98 259	96 353	68 785
Cheese	129 360	130 128	120 606
Total	3 880 739	3 934 969	1 571 954

It is possible to bring down the import liability for milk and milk products by establishing a milk-reconstitution plant based on imported milk powder. In this connection, it should be said that some years back such a plant was established but it failed. It is very necessary that the balance-of-payment effect of any such project should be calculated before it is established. In addition, the cost of production should be analysed and the cost of product distribution in the provinces should be worked out. Finally, it will be necessary to determine the product mix. If evaporated and condensed milk are to be produced, it would be appropriate to sterilize the milk before canning. But if bottled milk is to be sold, pasturization will suffice. Prospects for producing cheese and butter should also be investigated.