OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

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

Jamaica. Pre-investment activities.

MISSION REPORT
TO THE REPUBLIC OF JAMAICA
(3 - 9 APRIL 1984)

14786

by Yves MESSIAN
Senior Interregional Adviser in Pre-Investment Activities
RP/INT/84/011
Feasibility Studies Section
Division of Industrial Operations

Vienna
3 May 1984

1 - INTRODUCTION

Although Jamaica is not a Least Developed Country, this one-week mission was organized in order to take advantage of a visit to nearby Haïti and assess the present situation as regards pre-investment activities.

A summary report has already been submitted as "Back-to-Office Mission Report".

2 - PURPOSE OF MISSION

- Make the first contacts with Government authorities concerned with pre-investment activities;
- Evaluate the country's capacities in project identification, preparation and evaluation, and identify problems and bottlenecks in the field of pre-investment work, as well as needs for assistance, particularly training needs;
- Review available pre-investment studies and advise on their updating and completion;
- Advise on methodology for project preparation and future assistance;
- Advise on UNIDO's Computerized Model for Feasibility Analysis and Reporting (COMFAR).

3 - MISSION ACTIVITIES AND FINDINGS

Visits were paid to Ministries, Development Banks or Investment Corporations, and other Industrial Institutions, and meetings and discussions were held with senior officials on the present situation and activities in the field of pre-investment work. An assessment was made of the needs for direct assistance and for training in project identification, preparation and evaluation. Some feasibility studies, considered as important to be carried out, were identified.

The Adviser received good support from the UNDP and SIDFA Offices, and specially from Mr. Ed Mattes who was very helpful in organizing appointments and transportation. Some appointments were unfortunately impossible to arrange, and in particular, with the Ministry of Industry or the technical staff of the National Planning Agency.

3.1. - Scientific Research Council (SRC)

The Scientific Research Council is a statutory body established in 1960, under the Ministry of Science, Technology and Environment. Its work is designed to encourage:

- use of indigenous raw material for the manufacture of agro-industrial products, the diversification of traditional crops, and upgrading of existing industries that are oriented towards the agricultural sector;
- creation of new manufacturing industries through exploitation of local resources and local technology;
- improvement of the nutritional standards of the population;
- identification and development of non-traditional sources of energy.

The total staff is 125, of which 75 researchers and 2 economists.

The structure consists of three main divisions:
- Research and Development, with Engineering, Natural Products, Food Technology, Analytical, Mineral Resources sections;
- Co-ordination and Information;
- Administration.

The SRC has directed much of its efforts toward assisting the private sector in achieving industrial development through the provision of technical services and information, and in particular improving productivity by determining the most appropriate technology available, and assisting national and international funding agencies, financiers and investors in assessing the technological feasibility and economic viability of each programme or project.

SRC makes special efforts in the agro-industrial field and the utilization of waste, either from agro-industry or from bauxite/alumina industries. The stress is presently on transfer of technology and applied research.

SRC priorities are:

- Engineering and related sciences;
- Food technology;
- Mineral Resources.

The studies presently in hand concern:

- Caustic soda (Solvay process and the new Japanese Asahi process);
- Biomass, animal feed using biotechnology;
- Fertilizers;
- Single cell proteins;
- Essential oils;
- Mineral resources: tiles - clay tiles - tableware - sanitary ware.

SRC works in close liaison with the University, which makes basic research.

They carry out the technical study, including costs of production, but require their clients to make the marketing study, the economic study and the overall feasibility study.

SRC's main problems relate to:
- the inability to pay competitive salaries and therefore to attract the adequate quality of personnel;
- the lack of equipment.

3.2. - Jamaica Industrial Development Corporation (JIDC)

The new JIDC is just being formed from a merger between the National Industrial Development Company (NIDCO) (only founded in Sept. 1982) and the old Jamaica Industrial Development Corporation. JIDC is the Agency primarily responsible for the development and achievement of the Government's National Development Plan for Industry, and the improvement of the performance of the export section.

Its three major objectives are:

- The development of a coherent and clear-cut industrialization programme, with emphasis on the manufacture of non-traditional export items;
- The formulation, development and implementation of a National Factory Plan, with a three-year factory building programme, and
- The promotion of an on-going programme of factory retooling and refurbishing to meet the requirements of the industrialization programme.

The new Corporation has a staff of 170 (35 for NIDCO).
The main purpose is to improve companies' efficiency through:

- A comprehensive programme of training (technical training, management training) administered by an upgraded Training and Human Resource Division:
- Technical assistance and consultancy to be administered by a Priority Sector Programme Division, to upgrade the seven priority sub-sectors (garments and sewn products, footwear and leather products, food processing and agro-industrial products, furniture and wooden products, electrical and electronic products, building and construction material products, and automative products).
- A comprehensive Industrial Estates Programme, to be implemented by a well-equipped Industrial Estates Division.

JIDC does not make feasibility studies as such, but can make preliminary cost-benefit analysis.

Its main problems are considered to be:

- identifying and finding manpower (specialists);
- foreign exchange to pay consultants;
- lack of factory space.

3.3. - The National Development Bank of Jamaica (NDB)

The National Development Bank was created in 1981, as a successor of the Jamaica Development and Investment Bank (JDIB), but it really started its operations in 1983.

Its main objectives are:

- to fasten the economic development of Jamaica;
- to increase employment by assisting in the establishment, expansion, diversification and modernization of business enterprises; and
- to facilitate the widening of Jamaica's entrepreneurial base.

The Bank has a small staff of 25, including 4 senior professionals, and which will soon be increased to 32.

The main departments are:

- the Projects Department, with four analysts and one economist (three more to be recruited);
- the Finance Department, with four professionals, covering mainly four sectors:
  - Manufacturing industry
  - Processing and agro-industry
  - Tourism
  - Mining

NDB does not normally lend directly to the promoters but to Approved Financial Institutions (AFI) for onlending to promoters. These institutions include commercial banks, merchant banks and credit unions.

NDB approves loans through AFIs for the following types of projects:

- Construction of structures for productive purposes;
- Expansion or modification of structures;
- Purchase of machinery and equipment, new or used;
- Purchase of moveable fixed assets;
- Permanent working capital; and
- Rehabilitation of existing enterprises.

A project promoter has to apply to an AFI and not to NDB, and has to submit a detailed and comprehensive application form. The AFI will be responsible for evaluating the application, requesting financial credit from NDB, if it approves the application, taking adequate security, supervising the project after the loan has been extended, receiving loan repayments, repaying NDB for the credit advanced.

A programme has been devised to assist the promoter to prepare the required loan applications if he is unable to do so on his own account. According to this programme the promoter completes a simple project profile form and, if the project is thought to merit further consideration, he is advised to seek the service of a consultant (chosen from a panel of consultants approved by NDB and the AFI) to assist in the completion of the application form. The consultant fees up to a maximum of 3% of the loan

sought will be advanced to the consultant on completion of application. This advance will be repaid by the promoter from the loan proceeds if the loan application is successful; if not, the advance will be absorbed by NDB.

Therefore, NDB does not carry out feasibility studies by itself.

Maturity of the loan is from 3 to 10 years. The amounts range from J$ 40,000 to J$ 5,500,000.

The Bank only gives loans at present, and takes no equity. It has some World Bank lines of credit.

46 applications have so far been received since inception last year.

NDB has 2 IBM Personal Computers and uses the World Bank Computerized Model IPES (Industrial Project Evaluation System).

The Bank's problems concern:

- the poor quality of market demand analysis in the applications;
- the lack of experienced bankers in the staff;
- bottlenecks with the banks.

The view was also expressed that there are in Jamaica too many institutions dealing with investment, and that there is a need for an institution to co-ordinate all these activities.

3.4. - Jamaica National Investment Promotion Ltd. (JNIP)

The Jamaica National Investment Promotion was set up in September 1981 as a subsidiary of the Jamaica National Investment Company (JNIC) to act as the Government Agency responsible for promoting and facilitating private investment, that is to smooth and expedite the processing of all investment enquiries and proposals.

The JNIP also helps with the expansion of existing businesses, large or small.

The services JNIP provides include: the provision of basic information and advice on requirements and regulations governing all aspects of business operations; liaising with Government Ministries, agencies and relevant organizations, to provide services and facilities including factory space, work permits, trade licences and incentive packages; the speeding-up of the incentive approval process; research capabilities to help identify markets and new areas for project development; providing technical and managerial assistance to small business.

A new organization has been introduced in July 1983. The operational divisions, under a Group Director of Economic Development, comprise:

- The Division of International Operations (Liaison North America Office, Far East, Joint Ventures and Missions, European Office);
- The Manufacturing and Services Division;
- The Agriculture and Agro-Business Division;
- The Economic Research Division, divided into four sections:
  - Research
  - Project Evaluation and Incentives
  - Planning and Development
  - Industrial Services
- The Small Business Development Division

JNIP's total staff is over 100, of which 13 work in the Economic Research Division.

JNIP tries to promote projects which are export-oriented, create employment and/or save foreign exchange. It has targeted certain sectors that have been identified as having considerable potential for export development, areas such as garments, electronics, agriculture, agro-business and agro-processing, non-traditional minerals among others.

The Research Division does not carry out feasibility studies and relies on investors to bring projects; only a guide is given to the investor, how to prepare a project. This Division is considered as weak and needing assistance for project identification and preparation.

By early February 1984, a total of 221 new investment projects had been launched and implemented through JNIP, representing a total investment of J$ 330,95 million and employing 6,705 persons.

3.5. - Jamaica National Investment Co.Ltd. (JNIC)

Jamaica National Investment Co. is a holding company created in 1965 to invest the proceeds of the bauxite industry and to administer the Capital Development Fund, to finance the growth and development of Jamaica.

JNIC has 19 subsidiaries, among which:

- Black River Upper Morass Development Cy (BRUMDEC)
- Forest Industries Development Cy (FIDCO)
- National Gypsum and Quarries Ltd.
- Caribbean Cement Cy Ltd. (CCC)
- Petroleum Company of Jamaica Ltd. (Petrojam)
- Jamaica Mortgage Bank
- Jamaica Bauxite Mining Ltd. (JBM)
- Bauxite and Alumina Trading Cy of Jamaica (BATCO)
- Jamaica Bauxite Institute (JBI)
- Project Analysis and Monitoring Cy Ltd. (PAMCO)

JNIC has a total staff of 68 persons.

Three divisions particularly deal with investments:

. the Management Division
. the Investment Division
. the Joint Ventures Division

The Management Division, with 12 professional staff, deals with:
- management consulting projects, with a management consulting unit for the public sector;
- project appraisal; they think to have convenient technical staff for feasibility studies, and hire consultants and expertise;
- recruitment;
- administration of technical assistance foreign loans.

The Joint Venture Division helps in the setting-up of joint ventures, JNIC taking minority equity.

The Investment Division, which has 1 Director and 3 senior officers, is concerned with appraisal, negotiation and implementation of projects. The new industries are mainly agro-based. It does not carry out feasibility studies, which have to be undertaken by the promoters.

JNIC is not involved in small projects, but only looks at significant projects.

6 projects are presently under consideration:

- Publishing company
- Caribbean Engineering Cy
- Agro-industry: Bananas, flowers, etc.
- New agro-industrial products
- Jamaica aquaculture: fish-farming
- Rice mill

3.6. - Small Businesses Association of Jamaica (SBA)

The Small Businesses Association is a non-profit organization, established in 1974, and representing the entire small business sector in Jamaica. Its objectives are to foster, encourage and develop business throughout the island, to promote goodwill and further the collective efforts of the sector, to provide a medium whereby small business entrepreneurs can meet for discussion and find solutions for their common problems, to serve as corporate voice through which the small businesses can make their views known to the Government and the general public, to unite the efforts of small businesses in the area of purchasing and marketing as well as any other areas which by pooling efforts will bring about total benefits.

The Association has over 1,000 members, and its staff is 17. Most member companies show annual sales of under one million dollars and employ less than 25 people.

The SBA renders the following services to its members:

- Free advice regarding trade, customs, foreign exchange and other Government regulations;
- Bulk purchasing of raw materials;
- Grant of a quota for the importation of raw materials and capital goods, which allows members to draw on it for their companies' needs;
- Information on Government policies and changes affecting small businesses;
- Publication of a monthly newsletter, a quarterly magazine and an annual Small Businesses Directory;
- Provision of training courses, seminars and workshops;
- Provision of business services, such as secretarial, accounting, customs, legal, etc.;
- Provision of marketing strategies;
- Representation of members the planning level of many organizations.

The Association is very interested in training (management, production).

3.7. - <u>The Jamaican Bauxite Institute (JBI)</u>

The Jamaican Bauxite Institute is a technical institute created in 1975 as the technical advisory arm of the Ministry of Mines. It is a subsidiary of the Jamaica National Investment Co. The total staff is 75, among them 25 professionals (5 engineers, 1 chemist, 5 economists).

The Institute has physics and chemistry laboratories as well as a pilot plant for training, research and development, equipment testing.

JBI has 6 main Divisions:
- Finance and Projects
- Information
- Economics
- Administration
- Bauxite Reserves
- Process Research and Analysis.

JBI receives UNIDO's assistance through project ST/JAM/80/701, "Upgrading the Scientific and Technological Capabilities of the Jamaica Bauxite Institute".

Among the various projects under study or under consideration, are worth mentioning:

- A caustic soda project (Solvay process), for which the feasibility study was signed in December 1982 with the USSR. The study is under way.

- A caustic soda project using the Japanese New Asahi (NA) process and for which JBI would like UNIDO to carry out the feasibility study. This NA process offers significant advantages over the classic Solvay process in terms of raw materials efficiency, reduced fuel requirements and lower capital investment. This project was discussed in a further meeting between the Adviser and JBI's technical staff, and draft terms of reference were prepared for this study to be presented to the United States Trade and Development Programme for financing. JBI is to present a formal request to UNDP/UNIDO through the National Planning Agency (NPA). The study might take 5 months and cost about US$ 100,000. JBI would like to be considered as a consultant to carry out this study.

- A project for the production of special aluminas and selected aluminium chemicals from alumina hydrate produced in the Jamaica Bauxite Institute pilot plant. These products would be meant for the domestic and possibly Caribbean markets. A preliminary market survey has already been commenced and the first results indicate some scope. A pre-feasibility study is necessary in order to better define the technological requirements for special alumina production, develop the process design for selected aluminium chemicals, undertake a detailed market survey, identify and evaluate product lines and alternative technologies for production, write specifications for machinery and equipment, advise on the physico-chemical characteristics of the necessary raw materials.

  The estimated time to implement the first phase of the project would be six months, and the cost would be about US$ 80,000.

3.8. - <u>The Jamaica Bureau of Standards (JBS)</u>

The Bureau of Standards is a statutory body established in 1968. Its Board includes 5 representatives from the Government, 5 from the private sector and 2 from the consumers.

It is organized in 9 Departments:
- Food Science and Agricultural Commodities
- Materials Science
- Engineering
- Packaging
- Chemistry and Microbiology
- Regulations and Compliance
- Information
- Standards Development
- Administration

Each of the technical departments has at its disposal specialized laboratories and qualified staff (the Bureau employs 160 professionals).

JBS activities cover the selling of standards, third party certification, accreditation of commercial testing organizations, implementation of quality programmes, provision of meteorological services, provision of information re technical specifications and regulations.

Implementation includes the provision of institutional facilities for testing, calibration, training of industry personnel, and giving advice and consultancy to industry to achieve and maintain desired quality levels. The Bureau of Standards under the Industrial Assistance Programme (IAP) launched in 1978, offers testing and calibration services in Chemistry, Microbiology, Metallurgy, Engineering, Furniture, Packaging, Food Science and Quality Assurance. Training is provided to industry in various disciplines (quality control, preventive maintenance, etc.) through seminars, workshops or attachments for varying periods. In collaboration with other organizations, processes are worked out and documented (mostly in food, textiles and clothing, building materials).

4. - CONCLUSION

4.1. - Although the economic situation has deteriorated in the past decade, and in particular the industrial activity has declined by 30% from 1973 to 1980, entailing excess capacity, Jamaica nevertheless leaves compared to other developing countries, a favourable impression, due to:

- her relatively good endowment in human capacities, both quantitatively and qualitatively, in particular as regards engineers and scientists;

- the dynamism of her people, both in the business sector and in her institutions;

Jamaica also receives the assistance of a number of expatriates. Besides, the proximity to a big country and a big market (USA) is a further asset.

4.2. - As far as pre-investment activities are concerned, the impression is that many institutions are dealing with investment, and that their particular responsibilities in this field do not appear to be precisely delimited. A mechanism for co-ordinating all these activities and institutions would appear as useful.

4.3. - As regards feasibility studies, in spite of the many institutions involved, none of these carries out studies by itself, and the feasibility studies are left to investors and private consultants, national or foreign, the institutions limiting their role to appraisal. The question may be raised as to whether it might be appropriate for at least one of the existing institutions to have an Industrial Studies Unit, able to carry out pre-feasibility and feasibility studies.

It is therefore recommended to set up an Industrial Advisory Unit for Pre-Investment Studies and Investment Follow-up in such a corporation as Jamaica National Investment Promotion (JNIP).

4.4. - Since no institutions were found to make feasibility studies, few needs were expressed for training in project identification. preparation and evaluation.

4.5. - The local production of caustic soda used in the alumina industry to substitute for imports might reduce the requirements for foreign exchange by some $ 20,000,000 per year, and international comparisons show that the New Asahi process has significant advantages over the Solvay process. The magnitude of the foreign exchange savings gives this project considerable interest, and it is worth investigating further. Upon confirmation of the Jamaican Government's interest in this NA project through a formal request, UNIDO's Feasibility Studies Section will approach the USTDP for financing and take steps to get the feasibility study carried out.

4.6. - The production of special aluminas and selected aluminium chemicals from alumina hydrate produced in the JBI's pilot plant is also of great interest for valorizing local natural resources.

Again UNIDO's Feasibility Studies Section can, upon confirmation of Jamaican Government's interest through a formal request, assist in securing the financing of this study and its carrying out.

5. - IMMEDIATE FOLLOW-UP

It is recommended to the UNIDO Senior Industrial Development Field Adviser in Kingston to liaise with the JBI and the NPA in order to speed up the administrative process and convey to UNIDO the requests for these two feasibility studies.

Distribution:

Mr. Carré
Mr. Hacini
Mr. TAndon
Mr. Veltze-Michel
Mr. Vassiliev
Mr. Becker-Boost
Mr. Biritz
Mr. May
Mr. Balasz
Mr. Judt
Mrs. Di Pietro
Library
Registry

ANNEX 1 - JAMAICA - LIST OF PERSONS MET

UNDP

Mrs. B. McSweeney	Resident Representative
Mrs. D. Francis	Senior Programme Assistant
Mr. E. Mattes	UNDP Intern
Mr. S. Dello Strologo	UNIDO SIDFA
Mr [illegible]. Bradley	UNIDO Salt Expert
[illegible]. S. Odegard	Handicrafts Industries Expert

Scientific Research Council

Dr. P. Hamilton	Executive Director

National Industrial Development Company Ltd. (NIDCO)

Jamaica Industrial Development Corporation (JIDC)

Mr. W. Woodham	Executive Director

Small Businesses Association (SBA)

Mrs. V. Sharpe	Information Officer

Jamaica Bauxite Institute (JBI)

Dr. C. Davis	Executive Director
Dr. C. Douglas	UNIDO Project Coordinator
Mrs. K.L. Clarke	Director, Finance and Projects
Dr. R. Dadea	Consultant

National Development Bank (NDB)

Mr. R. Roberts	Director, Project and Planning

Jamaica National Investment Promotion (JNIP)

Mrs. Simmonds	International Operations Division
Mr. M. Gordon	Research Economist, Research Division

National Planning Agency

Ms. D. Owen	Technical Assistance Officer

Jamaica National INvestment Co.Ltd. (JNIC)

Mr. B. Drum	World Bank Management Consulting Advisor
Mr. K. Moore	World Bank Investment Consultant

Bureau of Standards

Dr. A. Henry	Executive Director

Eagle Merchant Bank of Jamaica Ltd.

Dr. P. Chen-Young	President

ANNEX 2 - DRAFT

TERMS OF REFERENCE

JAMAICA CAUSTIC SODA

1. Qualifications: (a) Consultant must be thoroughly experienced in the N.H. process (Asahi Glass), (b) must have ready access to US Aluminium Companies and US Caustic Soda Companies, (c) must be competent in knowledge of US equipment manufacturers fabricating or manufacturing all equipment needed for the process.

2. Determine present and 10-year projected costs of caustic soda for US export to Jamaica.

3. Determine projected caustic requirements for Jamaica - 10-year.

4. Determine projected caustic consumption by Aluminium Company - 10 year.

5. Determine percentage caustic concentration each company can use.

6. Determine market valuation and volumes of spin-off products soda ash, sodium bicarbonate, hydrated lime, and ammonium chloride.

7. Determine alternative financial prospects to finance venture, % interest, taxes, royalty, and participation by Jamaica Government.

8. Determine if Aluminium Companies have interest joint venture to finance and operate the facility; if so, who might.

9. Estimate capital and operating costs, depreciation, etc., adequate in accuracy for feasibility within +25%.

10. Prepare preliminary plant layout, detailed process description.

11. Test Jamaica lime quality by Asahi Glass.

12. Evaluation of new material and utilities.

13. Evaluation of process and alternatives.

14. Evaluation of site locations.

15. Determine source of fresh water for process, process cooling and wastewater disposal.

16. Work with Asahi Glass as to licensing of process, cost and services available.

17. Indicate equipment and facilities and cost that can be fabricated locally.

18. Develop capital and operating costs for alternatives of importing salt and or calcined Trona.

19. Prepare project report and discuss with JBI, Aluminium Companies.

20. Completion of project to be within 5 months.

21. Project should be planned in phases of 200,000; 400,000; 600,000 tons soda ash increments.

ANNEX 3

PROJECT BRIEF

NAME OF PROJECT : PRODUCTION OF SPECIAL ALUMINAS AND SELECTED ALUMINIUM CHEMICALS FROM ALUMINA HYDRATE PRODUCED IN THE JAMAICA BAUXITE INSTITUTE (JBI) PILOT PLANT FOR THE DOMESTIC AND POSSIBLY CARIBBEAN MARKETS.

OBJECTIVES : TO CONVERT AN INDIGENOUS RAW MATERIAL PRODUCED IN A MULTIPURPOSE ALUMINA PILOT PLANT ESTABLISHED AT THE JBI BY THE GOVERNMENT OF JAMAICA AND THE UNITED NATIONS (UNFSSTD, UNIDO AND UNDP) TO HIGH VALUE PRODUCTS IN ORDER TO EARN AND SAVE FOREIGN EXCHANGE FOR JAMAICA AND TO OFF-SET R+D COSTS INCURRED IN PURSUING OTHER DEVELOPMENT OBJECTIVES.

BACKGROUND :

The Government of Jamaica with United Nations' assistance is in the final stages of establishing a pilot testing alumina plant of 12 kg per hour capacity which will be commissioned during the period May-June 1984. The total project involved the establishment of modern laboratories and a complete complex dealing with salient aspects of the bauxite/alumina industry.

The bauxite/alumina industry is the most critical sector in the Jamaican economy accounting for over 50% of its total earned foreign exchange. The JBI is the monitoring, advisory and technical organization of the Government in respect of the industry.

In 1980 the UNFSSTD and the Government signed an agreement to develop the JBI through a project entitled: "Upgrading the Scientific and Technological Capabilities of the Jamaica Bauxite Institute". The total cost of the project (with UNFSSTD and Government's input) is US $5.0 million. This was earmarked for providing modern laboratories and an alumina pilot testing plant and to train Jamaican nationals and subsequently through TCDC projects assist other countries.

Numerous objectives were laid down for the project (the attainment of most of which are underway). However, one of the spin-off benefits of the project is that the alumina hydrate produced in the plant can be used to produce a variety of products which could yield significant direct and indirect economic benefits to Jamaica, while satisfying other objectives.

These benefits are specifically, the production of special aluminas and aluminium chemicals with which the project brief is concerned and for which financing is being sought.

The JBI has already commenced a preliminary market survey in this area (Jamaica and CARICOM) and the results to date indicate some scope for JBI providing at least some of the market requirements. However, in order to pursue the project effectively greater inputs are required.

PROJECT OUTLINE :

The project falls in the category of the fine chemicals industry with low investment cost and infrastructural requirements, and high value-added products with a high return on the investment. The JBI has the capability to generate prototypes (samples) at the bench and pilot plant scales; however, greater technological inputs (which are available) are required. The inputs and expected outputs required at these stages are outlined below.

It is noteworthy, however, that to convert a minimum of two (2) tons of alumina hydrate to special aluminas can be economically viable, depending on the product lines.

IMMEDIATE INPUTS :

1) Expertise in special alumina production (a minimum of ten years experience) for a period of at least three months to do the following:

   (a) Work with the JBI's engineers and scientists to better define the technological requirements for special alumina production (process chemistry, design, basic engineering, plant layout, environmental requirements, capital cost estimates).

   (b) Work with JBI's engineers and scientists to develop the process design for selected aluminium chemicals.

(c) Liaise with the economics division of JBI in developing its market survey, through provision of more detailed information on end uses.

(d) Identify and evaluate product lines and alternative technologies for production.

(e) Develop flowsheets, heat and material balances, piping and instrumentation diagrams, and write specifications for machinery and equipment; Assist in identifying prospective equipment suppliers and obtain quotations for analysis and evaluation.

(f) Advise on the physico-chemical characteristic of the raw material (alumina hydrate) required for producing selected special aluminas and aluminium chemicals, their specifications, process and quality control requirements.

GOVERNMENT'S (JBI) INPUTS :

(1) Pilot plant facilities
(2) Laboratory facilities
(3) Personnel - engineers, scientists, economists
(4) Administrative
(5) Local cost.

ESTIMATED PROJECT COST :

It is estimated that the first phase of the project will cost about US $80,000.00.

PROJECT DURATION :

The estimated time for implementing this phase of the project is six (6) months.

EXPECTED OUTPUTS :

1. A pre-feasibility study encompassing a basic process engineering design for special aluminas and selected aluminium chemicals with a preliminary overall economic evaluation.

2. Training of JBI staff in special aluminas and aluminium chemicals production.

JBI
April 1984