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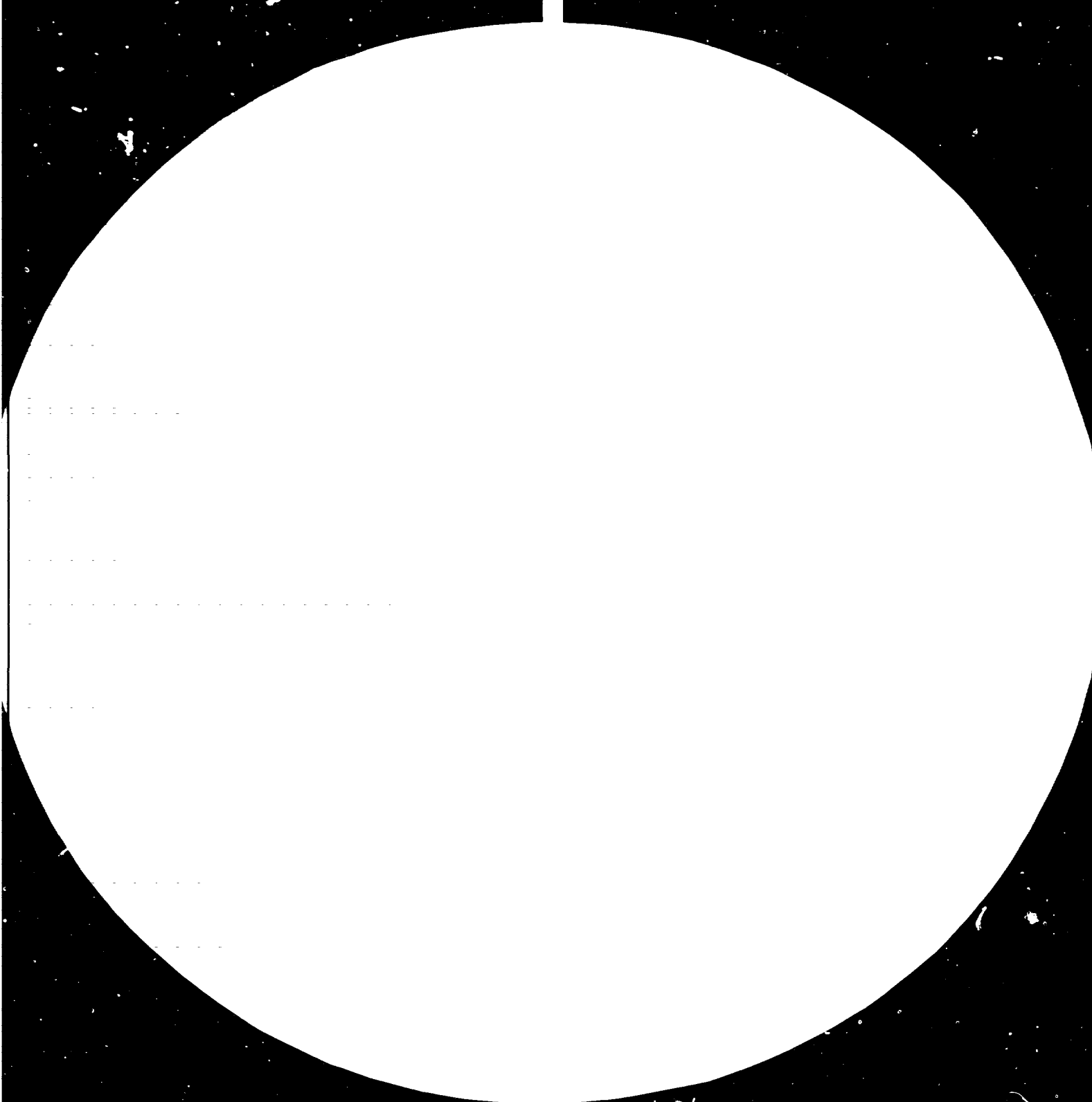
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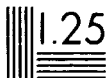




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United Nations Industrial Development Organization

Distr.
LIMITED
ID/WG.362/14
26 March 1982
ENGLISH

Preparatory Meeting of Directors of
Industrial Development Finance Institutions (IDFI)
on the Creation of a Technological Information
Exchange Network (TIEN)

Bridgetown, Barbados, 26 - 28 January 1982

BARBADOS DEVELOPMENT BANK

COUNTRY BRIEF: BARBADOS *

prepared by

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V.82-24022

STATISTICAL PROFILE OF BARBADOS

Area (Km ²)	430
Estimates of total Midyear population (1980)	246,000
Annual rate of growth of total population Average 1970-1980	0.3%
Crude birth rate per 1,000 inhabitants (1980)	16.3
Crude death rate per 1,000 inhabitants (1980)	8.2
Infant mortality per 1,000 live births (1980)	24.0
Gross domestic product (millions of 1980 dollars) 1980	660.6
Gross domestic product per capita (1980 dollars)	2,685.2
Exports in 1980 (millions of dollars)	177.6
Imports in 1980 (millions of dollars)	537.3
Rate of growth of industrial production (1979-1980)	6.1

THE COUNTRY: BARBADOS

The Island of Barbados is the most easterly of all the Caribbean Islands. It is located at a position $13^{\circ} 04'$ North and $59^{\circ} 30'$ West or about 100 miles east of the island of St. Vincent and 1,600 miles south-east of Miami.

The Island has an area of approximately 166 square miles. The landscape is generally flat, but hilly in some central and eastern parts, particularly in the Scotland District which contains rocks of the tertiary period.

The climate is tropical, pleasant and healthy, influenced mainly by north east trade winds and a frequent, but gentle sea breeze of about 14-20 km.p.h. At times, the temperature reaches 32° - 34°C , and hardly ever goes below 18°C . There is an average rainfall of about 1,500 mm. and over 3,000 hours of bright sunshine annually.

The country has a population of over a quarter of a million and a literacy rate of over 97 per cent. Education is compulsory for all from five years old and free from the primary to the tertiary level.

The social and utility services are well developed and the communication system among the most modern. There are newspapers, radio and television, libraries and a postal service. There is a modern airport and a seaport, facilitating regular air and sea services.

Social and cultural activities form an important part of the Barbadian life style. There is the Arts Council, the Barbados Dance Theatre, a number of drama groups and a variety of bands and orchestras.

THE ECONOMY
(See Appendices I and II)

The traditional main stay of the Barbadian economy has been sugar. The slumps and booms of that industry emphasized the need to diversify and led to serious attempts to develop the manufacturing and tourism industries. The tourism industry has grown to rival sugar as the main income earner and small manufacturing industries have been established. There is, however, no abundance of mineral resources and this has retarded the growth of the industrial sector. Consequently, there is still that high propensity to import and the resulting openness of the economy makes it very sensitive to external developments.

Despite the combination of an open economy, small size and a narrow resource base, the performance of the economy has at times been encouraging. In the period 1976-1980, real GDP increased by over one fifth to \$1.46 million and nominal per capita income almost doubled, increasing from \$3,138 to \$5,868 in 1981 prices.

Currently the outlook for sugar as well as for tourism does not look very promising and the need to industrialize has been re-emphasized. The Barbados Industrial Development Corporation (IDC), Barbados Development Bank (BDB), Barbados Institute of Management and Productivity (BIMAP), Agricultural Development Corporation (ADC), Barbados National Standards Institution (BNSI), Barbados Manufacturers' Association (BMA), and Small Business Association (SBA), are the public and private institutions which form the framework for the financing and promotion of industrial development.

The main elements of the Government's economic policies for industrial development are to:-

- (i) Create jobs by encouraging labour intensive enterprises.
- (ii) Expand manufacturing for export.
- (iii) Develop fully such industries as clothing, furniture, handicraft, construction, food processing, ship-building, etc.

- (iv) Promote local investment and remove the disincentives thereto.
- (v) Promote and exploit the complementarity of agriculture, industry and tourism.
- (vi) Safeguard the growth of indigenous industry through the CARICOM Treaty Agreement and the deepening of the integration process.
- (vii) Encourage the location of industries in rural areas.
- (viii) Promote tax haven facilities.
- (ix) Foster worker participation in ownership and management.

Despite the existence of the Development Plan and the institutions, there are still other requirements which must be satisfied. One of these is the emphasis in education.

The Island has an excellent system of basic education, but there is a certain inertia in moving away from the traditional at secondary and tertiary levels. The country needs more technically trained persons, analysts, researchers, management personnel, technologists and skilled technicians. However, there are attempts to alleviate the handicaps. Management training is undertaken at Barbados Institute of Management and Productivity while basic and secondary technical education is available at the Samuel Jackman Prescod Polytechnic and Barbados Community College respectively.

INDUSTRIAL DEVELOPMENT FINANCING ACTIVITIES

The Barbados Development Bank provides medium and long term financing for development enterprises, which contribute to the economic growth and well being of the country. In the industrial sector, activities financed by the Bank include manufacturing, processing, assembling, reconditioning and engineering, printing, machine shops and electronics. Outside of the Bank's current financing activities are the enclave industries, mainly electronics and garments, which are usually subsidiaries of large United States, Canadian and European firms.

Manufacturing projects financed so far include bakeries, concrete blocks, plastics, nails, barbwire, garments, furniture, food processing, quarrying and photography. The number and size of projects in the other categories have been small and include the assembly of electronic components, solar water heaters and watches.

CURRENT EXPERIENCES AND METHODOLOGY OF EVALUATION OF THE TECHNOLOGICAL CONTENTS OF THE INDUSTRIAL PROJECTS

The proposed structure of some projects brought to the Bank include the use of machinery and equipment, with capacities significantly in excess of requirements. This may be due to the lack of technical information on alternative machinery and equipment to minimise the scale of machines available or sometimes there is not much to choose between different technologies. The technologies encountered are usually imported in the form of machinery and equipment rather than complex processes. Often, the project represents an isolated use of the technology in the Island.

The growth in the industrial sector has brought with it an increase in the size of projects seeking finance from the Barbados Development Bank as well as an increase in the number of projects using comparatively sophisticated modern technologies. The level of analysis required is more demanding, often requiring inputs by the technically trained. In this regard, the Bank is operating under certain restraints. There are gaps in the flow of relevant information, as well as a lack of technically trained staff. The Bank is working to rectify the problem of staff, but there is the difficulty of recruiting experienced technical personnel within the constraint of current salary levels at the Bank. It has from time to time been able to use the resources of the Caribbean Development Bank, as well as foreign consultants and experts, however, there is need to provide counterpart staff to ensure that with the departure of the experts, some expertise remains in the country.

Methodology

In the evaluation of its projects, the stated policy of the Bank includes consideration of the appropriateness of technologies. This implies an evaluation of technological alternatives, with a view to selection in terms of the optimal combination of the projects components and the resources of local economy. Toward this goal, the nature of the technology required for the project must be identified. The best technology for the plant must be determined and the evaluation related to plant capacity, costs, specification, maturity of technology, technology sources, external linkages, labour and skills requirements and the means of acquisition.

The foregoing analysis requires the availability of certain types of information, if it is to be complete. At the moment, certain gaps exist which prevent a complete evaluation of the technologies of projects seeking financial assistance. These relate to the sources of machinery and equipment, specifications and maturity of technologies. To obtain this kind of information on an on-going basis, means having a constant flow of technical literature in many fields. This would almost certainly be too costly for any single finance institution to establish and maintain. The solution ideally would require a single source with the capability of ready access by authorised institutions.

OUTLINE PROPOSAL FOR TECHNOLOGICAL INFORMATION EXCHANGE NETWORK (TIEN)

The demands and requirements which accompany the expansion of the Bank's financing activities are expected to persist. Hence the Bank must be equipped to evaluate projects involving technologies of various kinds and in various stages of maturity. The benefits derived from the use of consultants and foreign experts may be optimized, if there are on the Bank's staff, persons with technical training, capable of learning from these experts. Also, there must be a free flow of information to facilitate a comprehensive evaluation of the various technologies. This would enhance the technological capability of the country.

In light of the constraints facing the country, in terms of the scarcity of technically trained personnel, gaps in information flows and the pressing need to select the most appropriate technology, the operation of a Technology Information Exchange Network should be to assist in the alleviation of these handicaps.

Network

The network should consist of developed and developing countries, as well as funding agencies: World Bank, Organisation of American States (OAS), Inter-American Development Bank (IDB), European Economic Community (EEC), European Investment Bank (EIB) and Caribbean Development Bank (CDB). Data Banks set up at strategic points to facilitate communication between countries and storage location. This would involve computer storage and retrieval systems. The system to be organised, funded and regulated by a central co-ordinator. All this to be done after feasibility studies have been carried out in the member countries and the necessary infrastructure established. Developed countries should be able to furnish the requirements easily, however, a lot of work would have to be done in the developing countries in setting up the required infrastructure.

Modus Operandi

- (a) Experts from funding agencies visit developing countries to help in assessing funding needs in setting up infrastructure.
- (b) Technical experts from developed countries team up with trained locals on research projects.
- (c) Results of research and other information fed into Data Banks.
- (d) Frequent exchange of periodicals and other information.
- (e) Regular updates of information base.
- (f) Members have access to Data Banks to find latest in technology, either directly or via Central Data Bank, using telephone or special communication links.

- (g) Constant monitor of performance of systems installed and data fed into Data Banks.

OTHER SUGGESTIONS

The appropriateness of technology should be based on the industrial development strategy which will be determined by the development objectives. These objectives may be:-

- (a) The satisfaction of basic socio-economic needs;
- (b) The maximum employment and development of natural and human resources; and
- (c) The fostering of income distribution.

The achievement of these objectives may well depend on the broadening of the industrial base through identification and formulation of projects and an optimal allocation of resources, financial, natural and human in activities designed to give maximum economic return. This endeavour entails project evaluation.

The needs of proper project evaluation must be satisfied if the exercise is to yield the benefits intended. The relevant institutions must exist and be adequately staffed. This will require personnel trained to evaluate projects and prepare comprehensive pre-feasibility studies. The project team should include economists, industrial engineers, technologists and financial analysts. Also is needed, the existence and awareness of opportunities for gains/benefits at the individual and national level. This would ensure that projects come forward to be evaluated. When this requirement is not fulfilled, there will be the need for the Development Finance Corporation to identify and formulate projects. This will require personnel trained in project identification and formulation.

In less developed countries, due to the need to industrialize rapidly, there is at times a need to upgrade the technology base. Also a greater decentralization of industry and a re-orientation of the design and structure of production is needed. This usually entails certain measures of technology choice which take into account the particular characteristics of the country, among other things, its resource base. The choice of technology is then to be based on the development needs and to the economic circumstance.

In the above regard, Industrial Development Financing Institutions may assist in the following ways:-

- (i) Helping to alleviate the constraints which are due to the lack of funds. There is usually a lack of funds to pay for consulting services and staff training.
- (ii) Provision of experts to work with clients in the industrial sector.
- (iii) Assisting in the setting up of basic industries. Also assisting in the development of the capacity to produce engineering goods which is necessary for the growth of technological skills.
- (iv) Helping to identify comparative advantage and assisting the orientation of skills training programmes accordingly.
- (v) Helping to encourage scientific and technological research in the country and facilitating the transfer of scientific and technological information.
- (vi) Providing a follow up, advisory service to projects financed.
- (vii) Getting involved in project identification and formulation and carrying out pre-feasibility studies.

The establishment of a Technological Information Exchange Network would be a significant step toward the achievement of the above-mentioned goals.

ESTIMATES OF REAL GROSS DOMESTIC PRODUCT - 1974 PRICES

(BDS\$ 000)

YEARS 1975 - 1980

APPENDIX I

SECTOR OF ORIGIN	1975	1976	1977	1978	1979	1980
Sugar	41,680	43,834	51,093	42,991	48,517	57,602
Non-Sugar Agriculture & Fishing	24,525	27,146	21,296	29,356	29,789	24,979
Mining and Quarrying	869	1,294	1,104	1,591	1,647	1,989
Manufacturing	69,289	81,005	83,574	91,217	92,783	98,421
Electricity & Water	10,095	10,765	12,298	14,213	15,804	16,838
Construction	44,146	49,949	43,091	46,309	52,744	56,436
Wholesale & Retail Trade	119,638	122,242	124,609	129,461	142,004	156,678
Tourism	56,138	57,869	77,094	86,258	107,021	111,059
Transport, Storage & Communications	43,378	44,382	45,473	46,607	48,266	49,705
Business & General Services	120,184	116,339	121,291	123,014	126,089	128,057
Government Services	97,050	97,050	97,050	99,478	102,000	101,999
TOTAL	626,992	653,875	677,973	710,493	766,664	803,763
Real Growth	-3.1	4.3	3.7	4.5	7.9	4.9

Source: Central Bank of Barbados
Annual Statistical Digest, 1980
Page 131

Index of Industrial Production

Average 1971=100

YEARS 1975 - 1980

APPENDIX II

	Total Industries	Quarrying	Total	M A N U F A C T U R I N G								Electricity and Gas
				Food	Beverages and Tobacco	Wearing Apparel	Chemicals	Petroleum Products	Electronic Products	Other Non-Metallic Products	Other Manufacturing Products	
Weights	1.000	29	800	151	170	111	29	38	40	42	259	171
1975	121.7	53.1	121.9	132.0	110.3	128.2	119.5	116.3	-	80.4	129.2	125.7
1976	140.7	96.3	143.7	149.7	109.0	158.6	134.9	114.9	-	77.2	174.4	134.1
1977	144.8	81.6	145.4	152.0	124.4	169.1	109.9	115.5	-	76.8	165.3	153.0
1978	159.2	83.7	158.1	160.4	139.4	159.7	119.0	118.8	496.4	61.2	134.9	176.9
1979	165.3	66.2	160.9	168.0	114.4	169.2	119.7	127.7	596.0	98.7	131.4	199.5
% Change over '78	3.8	3.0	1.8	4.7	-18.0	5.9	0.6	7.5	20.0	21.6	-2.0	12.8
1980	175.4	108.9	170.7	173.7	125.1	165.4	149.9	133.3	687.7	105.4	134.0	208.9
% Change over '79	6.1	64.5	6.1	3.5	9.4	2.3	25.2	4.4	15.0	6.8	2.0	4.7

Source: Barbados Economic Report, 1980 - Page 30

