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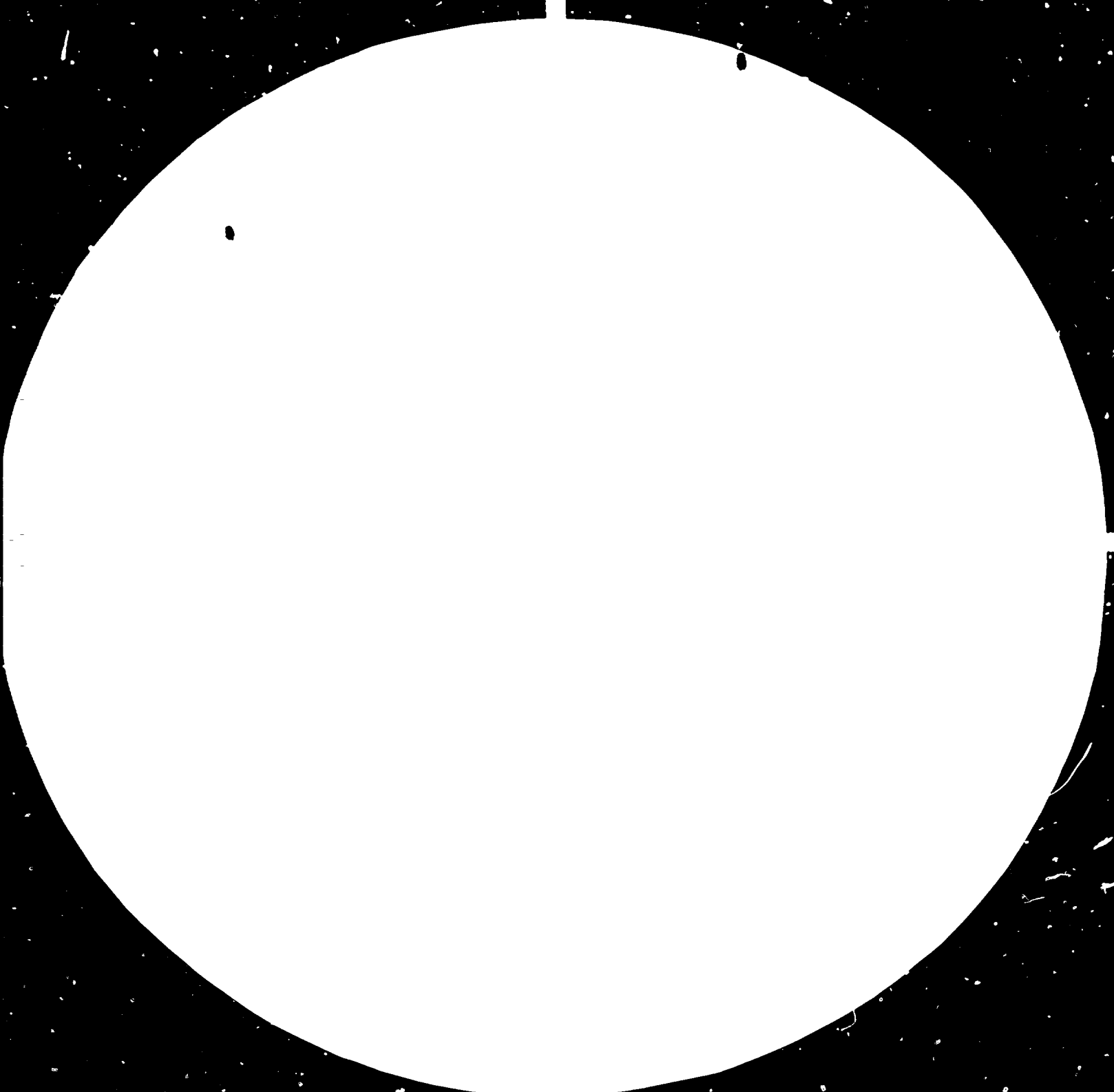

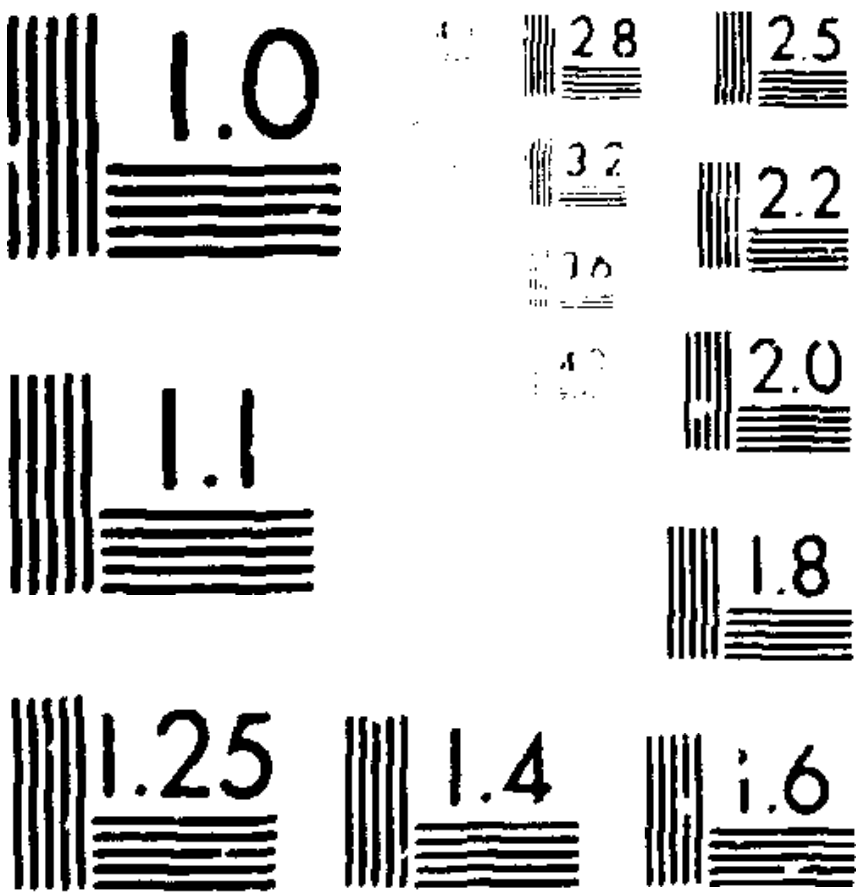

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Preparatory Meeting of Directors of
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on the Creation of a Technological Information
Exchange Network (TIEN)

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COUNTRY BRIEF: MAURITIUS*

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* The views expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing

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SECTION I: Brief Description of Industrial Development Financing Activities

1.1 The Development Bank of Mauritius (DBM) was established in March 1964 under a separate statute with clearly assigned role and objectives. Some of the important objectives are given below:

(a) The financing, management and establishment of

(i) new undertakings;

(ii) schemes for expansion, better organization, modernization and more beneficial exploitation of any undertaking;

(b) the conduct of research into the industrial, agricultural, mineral, maritime and commercial potentialities of Mauritius;

(c) the participation of private enterprises and capital whether from abroad or from within the country in the said activities.

1.2 DBM functions in close collaboration with the concerned Government departments and agencies within the overall policies for industrialization as laid down by the Government of Mauritius. Currently, the bank has attuned its working to the materialization of the sectorial policies and programs outlined by the Government in the 2-year Plan (1980-1982) for economic and social development.

1.3 At the inception of the bank, the country had no worthwhile industrial sector other than the sugar sector. The bank was, therefore, constrained to finance non-sugar projects that were being set up on an ad-hoc basis and without any sectorial planning. Within a few years of its existence two sectors -- tourism and textile -- were rapidly developing which received due support from the bank with the result that the financial assistance sanctioned to textiles (including clothing) and hotels had the lion's share of 47 percent of the bank's loan portfolio as at the end of June 1980. In view of the emerging diversification of industries in Mauritius within the next few years, it is anticipated that the share of these two sectors will decline although new units likely to come up in these sectors, if viable, will continue to be supported.

1.4 During the last decade the financial support of DBM resulted in the growth of several new units in food processing, livestock, fishing, chemicals etc.

1.5 Unde the Government's industrial policy, export-oriented industries, tourism and agro-based industries (including food processing) comprise the priority sectors. DBM has geared up its machinery to extend financial assistance to the various units in these sectors -- new or under expansion. In view of the shortage of yarn in the country, as a policy, the bank encourages entrepreneurs to produce more yarn required by the export processing zone units.

1.6 Import substitution industries are also supported in a large mesure. Out of Rs 55 million sanctioned to 31 units during 14 months ended December 1980, 18 units for Rs 31.7 million are import substituting industries like synthetic marble, screws and bolts, electric/filament lamps, peanut butter, plastic bottles etc. In years to come it is anticipated that many more import substituting industrial units particularly in the agro-based sector, including food processing industries, will be set up with the active assistance of DBM.

1.7 DBM has assigned to itself a dynamic promotional and financing role for small scale industry development. It operates a "Small Scale Industrial Loan Scheme" with concessional interest and liberal repayment terms. The category wise position of the assisted units is broad based and includes furniture making, garments, light engineering, leather works, poultry, fishing etc. An integrated assistance program for small scale industries is being worked out. The small scale units are shaping themselves as effective tools of employment creation in the country. The DBM renders counselling services to the small entrepreneurs and has turned out to be the largest financing and promotional agency in the country for small scale industries.

1.8 The role of DBM is not merely confined to the traditional financing functions. It has taken upon itself an innovative role in the provision of infrastructure for industries by setting up two major industrial estates. Because of this measure, provision of factory space at a reasonable cost to the entrepreneurs without waiting periods and capital outlays on building construction has benefitted the entrepreneurial class and accelerated to a large extent the industrial growth.

1.9 Consistent with the Government's policy of achieving economic growth with emphasis on export promotion, the DBM has been entrusted with an important and non-traditional role of formulating and implementing export credit guarantee schemes for the benefit of the Mauritian exporters. With the introduction of the schemes, a long felt need of the export community for liberal financing facilities from banks and diversification of products and markets is being fulfilled. The competitive ability of the Mauritian exporters will be further strengthened by the introduction of export credit insurance scheme which the bank proposes to launch shortly. These measures widen the functional base of the DBM and also underline the responsiveness of the financing institution to the emerging needs of the industrial and other economic sectors.

1.10 As regards resource requirements, the bank depends on the Central Bank and the Government's budgetary allocations for its local resources while foreign resources are tapped under foreign lines of credit with the World Bank, African Development Bank and certain other institutions abroad.

SECTION II: Current Experience and Methodology of Evaluation of the Technological contents of Industrial Projects

2.1 The industrialization process of Mauritius is still in its evolutionary stage. A major portion of the industrial set-up belongs to the medium and small scale sectors. There have also been some units set up under the large scale, particularly in textiles (spinning and weaving). In view of the insular geographical position of the island, the inflow of the technological capabilities has been very limited and confined to the extent of its needs for harnessing the physical and human resources. The general emphasis in the choice of technology is cost reducing, capital saving and labour intensive technology with a possible contribution to employment promotion and maximization of the industrial output. The technology suited, therefore, is intermediate and simple technology rather than a sophisticated one.

2.2 Technical studies are made by DBM at various stages during the project. The fact remains that the choice of technology is initially made by the entrepreneur. It is generally observed that such a choice of the entrepreneur is not made by him deliberately and after a careful cost benefit assessment of the various alternative technologies available for a particular project. It depends on the circumstances of each case. In the case of joint ventures, the local partner entirely depends on the foreign collaborator in the selection of the appropriate technology for the project to be promoted. The responsibility of purchasing the required plant and machinery and provision of the technical know-how including training of the local people is specifically entrusted to the foreign collaborator under the joint venture agreement.

2.3 As the domestic capabilities for manufacture of capital and producers goods do not generally exist in the country, the entrepreneurs have to look to dependable sources of supply of machinery and equipment on a turnkey basis from the developed and some developing countries abroad. In the case of such turnkey projects the seller abroad undertakes the

total obligation to offer the technical and equipment packages on a "conception to completion basis". In the case of these projects, the technological content flows into the country as an integral part of the total package for a specific project. As a consequence, the entrepreneur or a development financing institution like DBM has in fact little choice of technology. Further, as the technical fees and royalties are generally paid as components of the total price for equipment and services, the entrepreneur and the financing institution will have to evaluate the terms and conditions of the contract for the supply, erection and commissioning of the industrial project including the prices payable at various stages of its execution and the mutual obligations of the contracting parties concerned.

2.4 For the evaluation of technological contents of industrial projects, DBM carries out necessary technical studies. At the pre-project stage, the discussions held with the promoters also cover the technical feasibility of the proposed project. It is seen whether a particular manufacturing process is practicable and if so, the operating conditions required for it. The impact of the technical process on the investment and operating cost is also studied. The technical assessment is carried out by drawing from the past experience of similar projects financed by the bank and the in-house experties available in the bank. The services of independent experts and consultants are not generally called for.

2.5 The promoter is required to furnish a project report establishing the economic, financial, technical and managerial feasibility of the project. Besides this, information on various technical and other aspects of the project is also required to be submitted to the bank in the standard application form for the financial assistance to industries. The main aspects of the technical feasibility covered by the bank's evaluation are as under:

(i) Assessment of the Production Process

It will be seen whether the choice of the process is right keeping in view the economic consideration such as the availability of raw materials, the extent of the market, the employment potential of skilled and unskilled people etc. If alternative choices are available, the comparative advantages and disadvantages of the proposed process will be gone into vis-à-vis the alternatives.

(ii) The Choice of Machinery and Equipment

The range of equipment required, the efficiency of the machinery, its impact on the competitiveness of the firm, flexibility of operation, the possibility of utilization of such equipment in the anticipated circumstances will be studied in depth.

(iii) Sources of the Supply of Plant and Equipment and Availability of other Inputs

The project report should contain accurate and exhaustive inventory of the requirements of the unit both at the investment stage (land, buildings, plant, machinery, spares etc.) and a post-operation stage (availability of water, energy, labour, raw materials, transport etc.). A careful assessment is made of the credibility and past performance of the suppliers of machinery from abroad.

(iv) The Location of Industry

The site chosen for the setting up of the industry will also be given due importance in the assessment while deciding the site. It will be seen that

(a) the cost of factors of production and the advantage possessed by the location in this area in respect of the cost

(b) the availability of manpower, skilled and unskilled

(c) the market availability

(d) the transport availability and the cost

(e) the social economic impact of the unit on the development of the area such as creation of jobs in backward areas and remedying the imbalance in the regional development in the country

will be given particular emphasis.

(v) The Impact of the Project on the Environment

2.6 While the current experiences in the evaluation of technical contents of the projects are generally satisfactory, there have been instances of project failures because of non-materialization of certain assumptions made by the promoters at the pre-project stage. The following two cases of fairly large projects from DBM's past record will bring out to the fore how inadequacies of technical analyses and over-dependance on foreign collaborators for technical assistance and expertise could result in project failures.

2.6.1 Case A

The unit was promoted for the production of terry towels for export and manufacture of yarn as a joint venture by a reputed group in textiles with the assistance of anotner foreign group experienced in clothing. Both the groups among themselves shared a controlling interest in the equity upto 75 percent while the local partners held the balance. The promoters' group from abroad were stated to be efficient in management and technical know-how and also promoted a spinning mill in another country with success. The choice of the technical know-how was left to the foreign collaborators. The selection, installation, operation of the machinery was done on the expert advice of the group. Further, under a technical know-how agreement, most of the senior supervisors were recruited by the foreign group from abroad. The responsibility of training the local staff in other mills abroad was also envisaged. As consideration for the package services, a technical fee of 2 percent of the gross sales was payable.

The entire machinery for the spinning unit was supplied by one of the foreign collaborators from their existing units. The machinery was nearly 50 years old at the time of the installation of the new project. Both the foreign collaborators testified their efficiency supported by independent evaluation report. The marketing arrangements were also to be taken care of by the foreign collaborators, mostly by way of export to EEC and other countries.

The factory could not start production as anticipated within the scheduled period due to a number of factors. There were cost escalations and spiralling pre-operative expenses. The machinery efficiency was also questionable and did not work in three shifts as anticipated. There were problems of marketing which were not adequately taken care of by the foreign collaborators who managed the company. Due to financial stringency, the unit could not progress and was closed. The contribution of the foreign collaborators to management efficiency and technical competence of the unit was questionable.

2.6.2 Case B

The project was a weaving plant for production of grey cloth for exports to EEC and other countries with a fixed investment of over Rs 21 million. The promoters were a well reputed group from a developed country dealing in textiles for over 150 years. They also launched textile plants in other African countries. While the project was for composite textile mill both for spinning and weaving, at the first stage weaving unit was started, geared for a 3-shift working.

The selection of machinery was left to the foreign collaborators. Under a technical assistance agreement with the promoters, various aspects of the projects such as the design and engineering of the plant, selection, purchase and installation of the plant and equipment, provision of qualified personnel for efficient competence,

supervision and operation of the plant and responsibility for training of local technical personnel and purchase of raw materials, were entrusted to the foreign collaborators who also managed the unit. The total commissioning and other consideration payable for services were fixed high. The selling arrangements were also channelised through them. The raw materials were procured through one of their associates abroad. While the unit came into commercial production in the later half of 1976, it faced enormous difficulties. The working was uneconomical, resulting in the closure of the unit in December 1977. The main reason for the unit's failure was the inability of the management to run the unit economically and efficiently and impart competitiveness to the product for export to foreign countries. There was an apparent failure of an experienced foreign technical group to provide a need based operational plan for the unit.

2.6.3 The aforesaid two case studies pinpoint how the so-called reputed foreign collaborators take the inexperienced local partners for a ride in the name of technological support and industrial promotion.

2.7 The technical studies and cost analyses could provide at best a conceptual visualisation of the project possibilities over a period. With limited expertise and capabilities within the DFIs, it becomes difficult to impart prevision to the judgement regarding the technical viability of a project. Perhaps it should be the endeavour of the financing institutions to carry out the technical evaluation, not only at the pre-project stage but also at the post-project launching period. Project technical evaluation is a continuous process and, therefore, has to be a necessary ingredient of project monitoring and follow-up measures by development banks.

SECTION III: Information required for Technological Evaluation of the Projects submitted for Financing and the Existing Gaps for Obtaining such Information

3.1 Various factors which are considered in the evaluation of the technological content by DBM have been referred to in Section II above. In several advanced developing countries, the DFIs have attained maturity and evolved an institutional set-up for an appropriate evaluation of the project proposals from various angles including financial and technical. Some of them have excellent technical wings set up with a sizeable complement of specialists in various disciplines. The proposals are examined by tnem in depth as to the complexity of the technological implications. Despite this, it becomes difficult to cope with the diverse and bewildering technologies rapidly coming up from developed countries with the result that the services of technical experts and of various specialized institutes are secured by DFIs in case of comparatively larger projects with superior technology. As the final price price structure of the project and its capital outlays depend to a large extent upon the technical implications of the project, the task of integrating the financial and technical aspects of a project becomes an extremely difficult exercise for the DFIs.

3.2 The important information required for a technological evaluation of tne project will broadly be as under:

(i) As no project can be assessed in isolation, its relation to the economy and other projects in the development program

(ii) Establishing the appropriateness of the technology vis-à-vis the resources and facilities available at the proposed project site and whether they meet the needs of the project in the long run

(iii) The impact of the technology on the economies of scale of production - in terms of cost reduction, output maximization and operational efficiency.

(iv) As the technology obtained from industrialized countries is investment-oriented and labour-saving, it needs to be established as to how the technology could be modified to suit the requirements of the recipient promoter/ country without surrendering the economies of operations.

(v) Procurement of the equipment, training of local staff and how it will be ensured that the plant and machinery will operate at anticipated levels of efficiency and what obligations will be imposed on the supplier in case of non-materialization of stipulated technical and production efficiency of the project.

3.3 In actual practice, DFIs are confronted with a number of gaps in obtaining such information, more important of which are listed below:

(i) The project promoters are generally non-technical people. They have little or no knowledge about the manufacturing process and all other aspects of the technology proposed to be acquired by them. It must be stressed that in developing countries, most of the promoters come from the trading class.

(ii) The promoters generally do not place adequate stress on technology selection. Instead, they look for a dependable and responsible source of supplying equipment together with an undertaking to provide the technical know-how and training so that the project does not suffer long teething-troubles. In other words, the choice of technology does not receive the attention it deserves.

(iii) Non-availability of information about alternative technologies and their comparative efficiencies and economies. Paucity of consultants and technical consultancy organization in some countries adds to the problem.

(iv) Lack of a scientific and rationalized methodology to avoid or forestall

(a) Unduly long time taken in project promotion

(b) unjustifiably long gestation period in execution

(c) Cost escalations of machinery and equipments and civil works

(d) Unsatisfactory quality and unreasonably high cost of manufactured products

(e) Slender margin of profit and

(f) Non-materialization of the anticipated socio-economic benefits such as employment opportunities.

3.4 A major problem of the DFIs in most of the developing countries relates to the difficulty of keeping themselves in active and close contact with the latest technological developments or technical innovations. Many of them, particularly the small organizations, are unable to develop the technical intelligence capabilities because of information gaps and also resources constraints. In the case of every project financed by them what is broadly ensured is that the project is prima-facie viable and falls within the national priorities of the respective government's socio-economic policies.

SECTION IV: Brief Outline Proposal for a Technological Information Exchange Network including Suggestions for the Method of Operation

4.1 In the context of the establishment of a new framework such as the proposed "Technological Information Exchange Network (TIEN), it will be worthwhile to review in retrospect the work so far done by global agencies such as the UNIDO in connected areas in the past few decades. It needs to be realised that UNIDO itself has made a unique contribution to the theoritical exposition of industrial needs of and strategies for the developing countries by seminars, conferences, training programs and publication of the voluminous literature on specific aspects of industrialization. Adequate care may be taken to ensure that the new organization, TIEN does not overlap with the existing functions of similar institutions. More important is the assignment of a core activity to TIEN which can shape it into a vibrant and dynamic institution devoting to the specifics rather than the generalities, to the concrete than the abstract and to the micro than the macro.

4.2 The initial thrust of TIEN's functio[illegible] be two dimensional in terms of

(a) Specific regions, and
(b) Specific industries.

The organization should aim at identification of technological needs of certain geographical areas and attempt to develop and introduce appropriate technology so that its impact on increasing employment opportunities of the region,on utilization of the available natural and human resources and on catering to the existing and growing market needs is felt in a large measure with an overall contribution to the economic growth. THE DFIs may be closely associated in the task of identification of the special areas where technological appropriateness could be studied in depth..

4.3 As regards the suggested role of TIEN in the technology acquisition and distribution for specific industries, it may be contributory and/or complementary depending on the recipient country. In the case of the more industrialized developing countries with established domestic capabilities for manufacture of capital and producers goods, besides creating an awareness among the DFIs and the entrepreneurs to the alternative technologies of specific projects developed in various countries, it will also be necessary to bridge the gulf between the research institutions and the needs of the industrialists. It will be extremely beneficial to these countries if the new organization can suggest ways and means of coping with the formidable task of utilization of the research results in actual areas of operation. The problem arises because of the reluctance on the part of entrepreneurs in experimenting the new technologies which have not been much tested and tried. In the case of countries with no established domestic capabilities, the TIEN's task will be to make available technological packages suitable to those countries for specific projects, which met with high degree of success in similar other countries.

4.4 Priority may be given to basic needs; the plant and machineries of consumer goods and consumer durables may be standardized with flexibility of adjustments. The industry needs of developing countries are well recognised -- low cost, more labour intensive and maximization of the output. The dissemination of information to DFIs and industrialists in different countries needs to be systematised. Success stories of industrial technologies may be compiled periodically and widely publicised.

4.5 A close liaison between the TIEN and DFIs will help the percolation of the industrial technology from the global reservoirs to the varying regions of the world.

SECTION V: Other Suggestions or Proposals to Comply with and Support the Needs of Project Evaluation and Technology Choice and how IDFIs could most Effectively Contribute to Strengthen the Technological Capabilities and Capacities in the World

5.1 While it is true that each country has to work out its own solution to the industrial problems, it does not nececcarily imply that each country should develop its own technology. The developing countries have no alternative except to look to the developed countries for import of appropriate technology to supplement the domestic technical capabilities. There have been several experiences where a technology unsuited to the socio-economic conditions of a developing country has been grafted on its production system. It resulted in the wasting of the precious scarce resources and created problems for industrial units. The main concern, therefore, is to identify, evolve, evaluate and introduce appropriate technology in whatever areas it has been possible. The traditional industries and many small scale and village industries have been operating on low technology. Although such a technology provides the people with not-so-high income in many cases, it has been tolerated because of the alternative risk of unemployment. Further, as enterprises grow, it becomes necessary to adopt higher level of technology for their economic functioning. This is true in almost all cases of small scale industries which grow into the medium scale and eventually to large scale. The evolutionary process needs stepping up of technology. It is, therefore, necessary that TIEN may assist the DFIs in identification of the appropriate technology which will adapt itself to the given factors of production, market conditions, skill availability and existing and potential managerial and technical skills. Such a technology should not however uproot the fabric of socio-economic conditions

5.2 While discussing about the role of DFIs in the promotion of technological capabilities and capacities in a country, it will be helpful to analyse their existing functions vis-à-vis technology transfer and the possible limitations. In developing economies, over the years the objectives of the DFIs have been changing from mere lenders of term credit to promoters of industrial development. In several countries they have been entrusted

with the task of removal of regional disparities and development of the backward areas. Among the promotional functions of the DFIs, the technological function also figures prominently. Their role in technology development needs to be recognised as a derivative function arising out of the primary function of financing the industrial projects.

5.3 Broadly speaking, the DFIs can effectively play a complementary role in implementation of the national technology policies. While dealing with industrial projects, they can focus the issues involved in a proper perspective and render necessary advice and guidance to the project promoters on a workable technology. The need for desirable attitudinal changes and creation of appropriate training and research facilities within industrial units may also be emphasised by them in the interest of maximum utilization of the technology. Exchange of information among the DFIs within a region or on a global scale will also be an ideal way for flow of technology.

5.4 DFIs' contribution to strengthening the technological capabilities and capacities in a country can be substantially enhanced by adoption of the following:

(a) As an essential part of long term corporate and development policy, DFIs should have general guidelines and checklists as to the type of technology they promote in the assisted projects.

(b) The need for a stronger technological infrastructure within the DFIs needs to be regonised and necessary steps taken for their implementation.

(c) As far as possible, encouragement and preferential treatment should be given to locally designed and manufactured machinery and local consultants rather than machinery imported from abroad and foreign consultants.

(d) The creation of a Technology Window to offer services of technical assistance, particularly for small and medium industries and also to improve the efficiency and productivity in specific areas, will meet a long felt need.

(e) DFIs should establish close liaison and contacts with the national institutes of research and other government departments to obtain feedback information on a continuing basis about the new technologies and manufacturing processes/products. They should make use of the services of such institutions regularly.

(f) To solve the problem arising out of the reluctance on the part of entrepreneurs to set up projects with indigeneous processes not tested and tried, if DFIs are convinced about the prima facie viability of such processes, they may participate in the equity capital of the companies.

(g) From their experience, DFIs can advise the governments regarding various technological efficiencies and play a constructive role in suitably influencing the national policies.

5.5. While the DFIs no doubt are well placed to influence and promote the development of national technological capabilities as mentioned in the preceding paragraph, they also are subjected to certain constraints and limitations. It may be erroneous to presume that they can take up on themselves the whole gamut of operations and functions relating to the appropriate choice of technology and its acquisition, absorption, adaptation and innovation. They are well suited to act as an effective channelising network for technology transfer but not to act as the reservoirs of technology. Further, they are effective intermediaries in influencing entrepreneurs and cannot substitute themselves for the recipients. The DFIs could become focal points for cooperation on a bilateral and multilateral basis in transfer of technology among developing countries in specific areas. The proposed new TIEN could play a useful coordinating and contributory role in the collection and dissemination of information through DFIs regarding the sources and uses of technologies of wide range sought and available over the world.

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