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Industrial Project Evaluation

(Summary of relevant extracts from the Report on the United Nations Inter-Regional Symposium on Industrial Project Evaluation, Prague, Czechoslovakia 11 - 29 October 1965)

for: Regional Symposia on
Industrial Development 1965 and 1966

by : Centre for Industrial Development
United Nations

I. INTRODUCTION

1. The Inter-regional Symposium on Industrial Project Evaluation, sponsored by the United Nations, in co-operation with the Government of the Socialist Republic of Rumania, which was the host, was held in the Valdstejn Palace in Prague from 11 to 19 October 1965. It was the first international meeting devoted exclusively to the consideration of issues and problems in industrial project evaluation.

2. The formulation of sound projects is of strategic importance in industrial development under any economic system. Careful and systematic scrutiny of proposed projects based on a thorough investigation of their economic and technical feasibility is indispensable in selecting those projects that are likely to be viable, and in committing financial and technical resources to them. Industrial project evaluation is particularly important in developing countries because of the need to use the limited resources available to maximum effect in accelerating industrial development. This Symposium therefore constituted the first stage of a sustained programme of research, training and technical assistance in the field of industrial project evaluation initiated by the United Nations Centre for Industrial Development and forms an indispensable and important part of the CID's continuing effort to assist developing countries in promoting and accelerating industrial development.

3. Participants from 30 developing countries in Africa, Asia, Europe, Latin America and the Middle East attended the Symposium on a fellowship basis under the sponsorship of the United Nations Bureau of Technical Assistance Operations. They were senior officials who have been actually involved in the task of industrial project analysis or industrial programming in their respective national governments or institutions. In addition, there was substantial representation of other countries and regional and national financial and economic organizations. A large number of specialists in the field of industrial project evaluation also attended the Symposium in the capacity of observers. The total attendance was 101.

4. The agenda of the Symposium was divided into four main items, viz. A. Preliminary stages in setting up industrial projects; B. Considerations in evaluation of industrial projects; C. Follow-up and supervision of industrial projects, and D. Survey of country experience.

5. The Symposium examined all relevant aspects of industrial project evaluation. The relation of the proposed project to the general strategy of industrial development, essential elements in the preparation of a project, data and other information required for the institutional aspects of industrial project evaluation were dealt with under item A. The examination of item B. which represented the main core of the discussion included the issues and problems connected with commercial profitability and national economic profitability, inter-industry linkages, managerial and technical skills, etc., survey of current practices and theories in the field of industrial project evaluation, pricing problems with special reference to foreign exchange and

foreign trade considerations and financial planning and its appraisal. The various procedures and tools required for the follow-up and supervision of approved projects were surveyed under item C. The account of the criteria and methods of industrial project evaluation followed in developing countries, case studies illustrating them and the problems encountered in the evaluation of industrial projects were highlighted in the course of the discussion of item D. This discussion helped to clarify the scope of improving existing evaluation procedures and practices in the developing countries and to formulate the programme of research, training and technical assistance recommended for the Centre for Industrial Development.

6. The participants had at their disposal substantial documentation consisting of 117 papers dealing with the various items of the agenda. There were 49 papers dealing with country experience and case studies providing information on existing practices and procedures of industrial project evaluation in developing countries. The rest of the papers dealt with various aspects of industrial project evaluation prepared by individual experts, regional and national organizations and the United Nations. The documentation included simple as well as highly sophisticated techniques of industrial project evaluation suitable for countries at different stages of development and with different economic systems, indicating the leeway to be made up by the developing countries in this field. The documentation thus represents an important source of information and knowledge and is capable of being directly and immediately useful to all persons engaged in evaluation of industrial projects.

7. The participants had useful discussions with the representatives of the State Commission for Investments, State Planning Commission and the designing Organizations of Czechoslovakia. These discussions gave the participants the opportunity to acquaint themselves with the practices and procedures of industrial project evaluation followed in Czechoslovakia.

8. The Symposium was inaugurated by Mr. Jan Piller, Deputy Prime Minister and President of the State Commission for Investment of the Czechoslovak Socialist Republic.

II. [illegible]

9. [illegible] in the context of the desire of developing countries [illegible] their industrial development which is viewed [illegible] dynamic factors in their overall economic development. [illegible] of the proper criteria and techniques of project evaluation was considered vital to the realization of this objective. With this in mind, the Symposium made a comprehensive review of the state of the art and in particular the experience of developing countries in industrial project evaluation [illegible] in a survey of the organizational framework available for project evaluation and an account of different criteria used and the techniques adopted in their application. In the course of the deliberations, several issues and problems were highlighted and general conclusions and specific recommendations were arrived at.

10. It was found that the considerations applied in evaluation of industrial projects in different developing countries varied in accordance with the availability and quality of data and other information, skills of the personnel and computing facilities which were largely a reflection of the different stages of their development. It was agreed that there was wide scope and urgent necessity for improving existing practices and procedures of industrial project evaluation in all developing countries. It was also evident that there was not a single and uniform set of criteria and techniques that may be applied in all developing countries. Criteria adopted in developing countries would depend on the development goals and relative weights attached to them while techniques of their application would depend mainly on data, skills, computing facilities, etc. on the one hand and economic systems and the forms of planning and stages of development on the other hand. It was against this background that the conclusions and recommendations were formulated. The general conclusions are spelled out in greater detail in the report.

a) General conclusions

11. An industrial project should be evaluated within the framework of the general strategy of industrial development which, in essence, means the formulation of industrial priorities for a prescribed length of time. These priorities should take into account potentials for import substitution as well as export promotion. Industrial sectoral programmes should be elaborated on the basis of these priorities. Internal consistency is of vital importance in formulating and co-ordinating the sectoral programme. In examining the relation of the proposed project to other projects, two types of relationship, i.e. competitive and complementary should be distinguished and carefully appraised.

12. The quality of appraisal of a project as well as its success depends partly on the thoroughness and the reliability of the project preparation which must necessarily include exhaustive investigation of its technical, economic and financial feasibility. In addition, a project report should point out how the proposed project fits in with the broad national objectives and the development programme of the country and should detail various uncertainties and margin of errors in estimating costs and benefits. Although blueprints and construction schedules are a part of the final (engineering) project report, the choice of a well tried out and commercially successful process of production and provisions for sound designing of the plant and scheduling of construction at a minimum cost should be clearly laid down in a project report.

13. A project report should incorporate comprehensive data and other information on private and social costs and benefits, foreign exchange effects, engineering and financial aspects, availability of technical know-how, availability of and arrangement for training technical and managerial personnel, infrastructural requirements, inter-industry effects, arrangements for the even flow of raw materials, intermediates, components and spare parts, retooling and servicing facilities, etc. The degree of details and comprehensiveness required may vary with the size and complexity of the project.

14. The systematic assessment of the data and other information contained in project reports requires a wide range of skills, especially in the fields of engineering and technology, economics and accountancy and financial planning specifically conceived for project appraisal. It was recognized that there was shortage of those skills in developing countries as well as facilities for imparting such skills.

15. The Symposium considered that there were certain issues pertaining to the functions of evaluating agencies and their organizational set-up which required further research. These issues are mentioned in the sub-section entitled Specific Recommendations.

16. ~~It is necessary that the proposed project should be commercially profitable. However,~~ Commercial profitability alone is not a sufficient criterion in developing countries seeking accelerated industrial development. National economic profitability occupies a central place in various considerations applied in appraising an industrial project in developing countries. This is especially true in conditions of inflationary pressures, generated by the development process where most of the proposed projects may prove commercially successful.

17. Three methods, i.e. the discounted cash flow method, payback or recoupment period and the average return on investment are available for estimating commercial profitability. In selecting different methods of estimating commercial profitability in developing countries, the earning streams at different points of time should be taken into consideration.

[illegible] ... The [illegible] the [illegible] rate of [illegible] pro- [illegible] designed [illegible] Second, commercial profitabili- ty [illegible] objectives such as stepping [illegible] opportunities, [illegible] of [illegible], etc. These objectives are not [illegible]. It is therefore necessary to attach relative weights to defined objectives. Third, the rate of interest in perfectly competitive conditions is supposed to express the time preference of the community in attaching relative weight to present consumption compared with future consumption. However, perfectly competitive conditions are not to be found in any country and least of all in developing countries. In a [illegible], in developing countries seeking to accelerate development, the vital issue of deciding the social time preference between present and future consumption cannot be left to the grossly distorted market mechanism.

19. The functions of attaching relative weights to defined development objectives and attaching relative weights to the contributions of these objectives belong to the highest planning and political authorities of the country. The tasks of evaluating agencies or departments in this context are two-fold. First, it is necessary to bring home to these authorities the importance and imperative necessity of attaching these weights without which it would be impossible to measure and assess adequately the national economic profitability of the proposed project. Second, the evaluating agencies should formulate alternative values of these weights in light of the broad qualitative policy objectives and should spell out their consequences so that the choice of weights may be made by the highest planning and political authorities with the clear understanding of the economic implications of the chosen values of weights.

20. Once the value of weights referred to in the preceding paragraph are given, it is operationally feasible to assess and measure adequately the national economic profitability of the proposed enterprise. The introduction of the measurement of national economic profitability will be a major advance in improving evaluating practices in developing countries.

21. In addition to measurement of commercial profitability and national economic profitability, there are other important considerations in evaluation of industrial projects which may or may not lend themselves easily to quantitative measurement. One of these considerations is the inter-industrial as-

pect or linkage effects. It includes on the one hand the need for supporting or providing facilities, particularly infrastructural facilities such as transport and power that may be required. On the other hand, the proposed project may meet the important needs of some other industrial sectors of the economy. In addition, the proposed project may give rise to other economic activities in the form of either forward or backward linkages. These considerations may be of great importance in some projects.

22. The importance of carefully evaluating the required technical and managerial personnel for the proposed project arises from the fact that the realization of expected results depends on the efficient operation of the enterprise. This appraisal essentially consists of an assessment of the manning table of the proposed projects, scrutiny of the organizational plan and examination of the availability of skilled personnel, arrangement for training of nationals, and hiring of foreign experts on a temporary basis and their respective costs. This appraisal is especially important in respect of functional managerial cadres (e.g. production manager, sales manager, etc.).

23. The shortage of skilled personnel is encountered in several developing countries and hampers the process of accelerated industrial development. This can be solved satisfactorily on the basis of long-term planning of human resources. The available evidence indicates that there is a direct relationship between the value added per employed person in a given industry and the skill composition of the work force in the same industry. This relationship worked on the basis of international comparative data and long-term industrial sectoral programmes may be employed to forecast the skill composition required for various industries in the future. Measures can be devised to adapt and expand facilities for formal education, vocational training, in-plant training, etc. to meet these demands.

24. Industries may be classified on the basis of the number of basic production processes. It is therefore possible and necessary to evaluate the contribution of the proposed project in accumulating technical know-how and in creating a pool of managerial and technical personnel capable of operating other projects with similar production processes.

25. The issue of the choice of location of industrial plants is a complex one and is inevitably intertwined with issues of regional and urban development. It therefore needs to be tackled in a separate seminar or symposium.

26. It is also necessary to take into account other considerations such as health of operatives, safeguards against accident, air and water pollution, etc. The minimum standards for them are or should be laid down by the government in the form of legally binding obligations.

27. Accounting prices are an instrument for estimating the criterion of national economic profitability. It may be advisable that pending additional research and accumulation of experience and data, the developing countries should adopt only partial solutions, in the form of working out accounting

[illegible] means [illegible] (e.g. foreign [illegible]) [illegible]

28. [illegible] inflationary conditions remain [illegible] in all prices is uniform. However, if there [illegible] under inflationary pressures, [illegible] in relative prices for important com- [illegible] cost-benefit-ratios.

29. It is [illegible] important [illegible] capital or since [illegible] of foreign exchange in evaluation of all industrial projects. In making these [illegible] calculating net foreign exchange earnings or savings it is advisable to use accounting foreign exchange rate in place of the official foreign exchange rate.

30. The objective of systematic follow-up is to check that the project follows pre-set lines. Since no project is likely to follow forecasts exactly because of changing conditions, follow-up should be made through continuous re-appraisal of the project in the course of implementation. Two issues arising from follow-up deserve careful attention: the commercial success of a project is not necessarily a valid guide to its success in achieving national economic objectives; and a project may earn satisfactory or even high return in certain local conditions even though it is operated inefficiently.

b) Specific recommendations

31. The comprehensive documentation prepared for the Symposium, it is felt, represents the largest single source of knowledge and information on issues and problems and practices in the field of industrial project evaluation. The Symposium therefore recommends that the United Nations Centre for Industrial Development (hereafter referred to as the CID) should make available immediately at least one set of all documents to each development finance agency, planning agencies and other evaluating agencies engaged in evaluation of industrial projects in developing countries. In addition, the Symposium recommends that the CID should bring out as soon as possible a sales publication of selections from these documentations in adequate copies to meet the needs of all development agencies and educational and training institutions.

32. The deliberations of the Symposium brought forth the following issues in industrial project evaluation on which the CID should carry out further research and investigations:

(a) factors underlying the formulation of the general strategy of industrial development for developing economies at different stages of development and with different sizes of domestic markets;

(b) Methodologies of sectoral (branches of industry) industrial programming, evaluation criteria for sectoral programmes, evaluation techniques for individual projects within the setting of the sectoral targets, and elaboration of regional and other input coefficients for the principal branches of industries as a tool of sectoral programming;

(c) Functions, organization or role of evaluating agencies with special reference to their responsibilities during project development and implementation.

(d) comparative evaluation of the period of recoupment or payout period and discounted cash flow methods in calculating commercial profitability;

(e) pilot studies in co-operation with developing countries in the application of the criterion of national economic profitability;

(f) a study clarifying the role of value judgments in the calculus of national economic profitability and relationship between these judgments and the possibilities for fulfilling different objectives;

(g) treatment of uncertainty in the evaluation of industrial projects and possible solutions;

(h) methods of evaluating management for the proposed projects and the role of functional management;

(i) required skill patterns for sectoral (branches of industries) development programmes or projections;

(j) pilot studies designed to test the suitability of alternative techniques of using accounting prices in developing countries;

(k) the use of international prices for inputs and outputs and other methods for evaluation of export industry projects with a view to integrating them in international specialization, and

(l) studies on follow-up practices in countries with different economic systems.

33. [illegible] industrial project evaluation [illegible] educational [illegible] developing countries. [illegible] considerations [illegible] in the preparation of the manual:

(a) The [illegible] important practical [illegible] Symposium;

(b) The [illegible] criteria [illegible] techniques of their application should be clearly made;

(c) Complement[illegible] competitiveness between different criteria should be brought out;

(d) [illegible] number of techniques or methods of varying degrees of complexity for the application of each criterion should be presented so that the evaluating agencies can select that which suits the specific conditions of the country;

(e) The relationship between the refinement of the techniques and the availability and reliability of data should be clearly stated;

(f) The scope for the quantitative measurement of each dimension of industrial project evaluation including the attainable degree of precision in the measurement should be indicated;

(g) Aspects of evaluation which do not lend themselves easily to quantitative measurement and in which the judgment of evaluating agencies becomes a major instrument of appraisal should also be clearly indicated;

(h) The limitations of each technique should be specified;

(i) The techniques of applying the criterion of national economic profitability should receive special attention in the manual;

(j) The manual should concentrate on those aspects of industrial project evaluation which are common to all industrial projects;

34. The most effective way to improve existing practices and procedures of industrial project evaluation in the shortest possible time is through the organization of [illegible] national or sub-regional levels by the [illegible] countries at the latter's request. The basic objective [illegible] is to train a nucleus of local person-

nel who can apply improved practices and procedures in evaluating industrial projects. The CID should bear in mind the following in organizing the training workshops:

(a) The officers attending the workshops should be those who are actually responsible for evaluation of industrial projects;

(b) The number of persons attending the workshop should be small enough so that each individual can receive personal attention;

(c) Three different types of skills, viz. engineering and technology, accountancy and financial planning at the project level, and economic analysis are required in evaluation of projects. It is therefore useful to ensure that officers with a background in each of these skills are represented in national workshops. In the case of sub-regional workshops, officers from participating countries should also have the necessary background in each of these fields.

(d) The training courses should be specially adjusted for each national or sub-regional workshop, taking into account concrete conditions in the country or the sub-region. The courses should be agreed upon by the CID and the country or countries requesting the workshop. The training courses should concentrate on actual techniques with specific illustrations which can be readily put into practice by the participants in the workshop. Techniques of working out national economic profitability should have an important place in the training courses;

(e) The CID should try to prepare two studies, one dealing with simple mathematical methods used in project appraisal and another explaining basic concepts used in project analysis and the economic rationale underlying them for those participants in workshops who have not specialized in these fields;

(f) The training workshops for industrial project evaluation should become part of the continuing programme of the CID. The experience of each workshop should be utilized to improve the work of subsequent workshops.

35. There is a shortage of trained personnel who can adequately perform the task of industrial project evaluation in many developing countries. The training of local cadres for this purpose and accumulation of experience by them will take a considerable time. In such countries the CID should send at

the Government's [illegible] to assist local personnel [illegible] evaluation of industrial projects [illegible] wherever required in establishing evaluating [illegible] requirements.

36. The CID should sponsor and organize at the earliest possible date a separate seminar or symposium on the complex problem of the choice of location for industrial projects. Its [illegible] should give special attention to the problems of location of industries in the context of regional economic integration schemes.

37. Many developing countries experience difficulties in identifying investment opportunities and formulating sound and comprehensive project reports. This limits the choice of projects from which the evaluating agencies can select the most profitable ones. It is therefore urgently necessary that the CID should assist developing countries by various means at its disposal in training cadres and establishing local institutions so that projects may be identified and formulated on a continuing and systematic basis. It may be emphasized that some evaluation criteria are implicit also in the identification and formulation of projects, since projects are formulated and submitted to evaluating agencies with an expectation of approval. In view of the fact that the formulation of projects consumes resources as well as time, both of which need to be economized in developing countries, it is necessary that persons and institutions responsible for formulating projects should have a clear understanding of the criteria which will be applied by evaluating agencies in their appraisal. This is especially important from the viewpoint of the criterion of national economic profitability in its broad sense. This issue should be incorporated in the CID's work programme on project formulation.

38. The follow-up of approved projects in developing countries has been impeded by difficulties in the construction of projects in the form of delays in the planned time-schedule and overruns in costs. One of the most effective [illegible] of overcoming these difficulties and reducing costs and time in the construction of projects lies in the use of network theory including critical path method in planning and implementing construction of projects. The CID should carry out further research in this field, preferably with the help of pilot studies of the actual use of such methods with a view to [illegible] out its operational feasibility in developing countries. These studies will help in [illegible] further steps that the CID should take in this field.

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