ABSTRACT

Every project has certain phases in its development and implementation. The appraisal stage of the project cycle should provide information and analysis on a range of issues associated with the decision making of the project. First, the administrative feasibility of project implementation must be fairly assessed and the marketing and technical appraisals of the project must be provided to evaluate its feasibility. Second, the financial capability of the project to survive the planned duration of its life must be appraised. Third, the expected economic contribution to the growth of the economy must be measured based on the principles of applied welfare economics and a series of assumptions used to undertake this appraisal. Finally, an assessment must also be made to determine if, and how, this project assists in attaining the socio-economic objectives set out for the country, along with an analysis to determine if this project is cost-effective in meeting these objectives. This chapter describes how this appraisal functions is carried out with the framework of project cycle.


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CHAPTER 2

A STRATEGY FOR THE APPRAISAL OF INVESTMENT PROJECTS

2.1 Introduction

Every project has certain phases in its development and implementation. The appraisal stage of the project cycle should provide information and analysis on a range of issues associated with the decision making of the project. First, the administrative feasibility of project implementation must be fairly assessed and the marketing and technical appraisals of the project must be provided to evaluate its feasibility. Second, the financial capability of the project to survive the planned duration of its life must be appraised. Third, the expected economic contribution to the growth of the economy must be measured based on the principles of applied welfare economics and a series of assumptions used to undertake this appraisal. Finally, an assessment must also be made to determine if, and how, this project assists in attaining the socio-economic objectives set out for the country, along with an analysis to determine if this project is cost-effective in meeting these objectives.

To carry out this task while offsetting some of the biases inherent in project appraisal requires a level of professionalism on the part of the analyst which is difficult or impossible to attain if project appraisal is carried out on ad-hoc basis. For the appraisal of projects in the public sector, a corps of project evaluators must be developed within the government in order to attain a level of project appraisal that will significantly improve overall project planning and selection. These evaluators should not only be aware of country’s political environment but also have a general sense that their mission is to provide an accurate assessment of a project's viability based on professionally determined criteria.

Often there is a tendency to examine the financial (or budgetary), economic and distributional (or stakeholder) impacts of a project or program as three independent outcomes. These three aspects of the overall performance for a project are, however,
generally closely inter-related and should be viewed as three parts of an integrated evaluation. For example, the distributional impact of a project can not even be estimated without information on the financial and economic appraisal. Similarly, its economic efficiency can be impaired if it can not rely on the project’s revenues or planned budgetary allocations needed for it to operate effectively.

The economic, financial, and stakeholder analysis of a project should also be closely linked because the information obtained at one stage of the appraisal may be essential for the completion of another aspect of the evaluation. For example, if we wish to know how much unskilled labor is benefiting from a project we must first know their wage rates and the numbers employed by this project. Such information is generally reported in the work sheets required to prepare the financial analysis of the project. If we wish to measure the impact of the project’s pricing policy on the welfare of a particular group of people, the basic information on the project’s customers and their relative consumption of the project’s output will be found in the marketing module, that is required for the financial appraisal of the project.

A preliminary analysis of a public sector project that looks at financial variables alone is not very meaningful, no matter how accurately it has been carried out. The appraisal will be of more value to the public sector decision-makers if the analytical effort is spread out over all the important aspects of the project to derive its impact on the net economic well-being to society as a whole.

The identification, appraisal, and design phase of a project’s development is composed of a series of appraisals and decision points leading to either the inception or rejection of the project. This process can logically be divided into four stages of appraisal and four decision nodes before the project receives final approval. These stages can be shown diagrammatically as in Figure 2.1.
2.2 Idea and Project Definition

The first and most important task of every procedure for project evaluation is to ensure that the prospective benefits of a project exceed its prospective costs. This is by no means a simple and straightforward task. In practice, it typically takes place in a sequence of stages (see Figure 2.1), each involving more time and resources than its predecessor, and as a
consequence (one hopes) developing a more accurate picture of the project’s likely costs and benefits. To be approved, a project should surmount each of the successive hurdles. A rejection, on the other hand, can take place at any stage. Some projects are so bad that their gross inadequacies are shown up even by the very roughest initial screening. Other, less bad projects, tends to be screened out in the pre-feasibility phases. The later stages of feasibility and detailed design may give rise to the rejection of some projects, but are more likely to be concentrated on such elements as the precise tuning and scale of the project, the specific design and determination of its components, etc.

Issues of design as well as other aspects of project strategy often involve much more than the simple quantification of a project’s likely total costs and benefits. The way in which these costs and benefits are distributed can also weigh heavily in determining its feasibility. Many projects involve numerous different groups of stakeholders. For example, for an irrigation project there are farmers, regional and local governments, the highway authority and highway users, the owners and residents of land to be flooded, the downstream users of the river’s water, etc. While it may be that the project could be brought to fruition over the opposition of one or more of such groups, it is clearly wiser for the sharing of benefits and costs to be arranged in such a way as to leave most of them content. Indeed, no project will get underway unless it is designed (including the way costs and benefits will be shared) so that every stakeholder group that has some sort of “veto power” is precluded from exercising that power.

Financial issues can also come into play in many different forms. Stories are rife concerning beautiful, modern hospitals whose facilities are largely wasted because of inadequate budgets for doctors’ and nurses’ salaries, for equipment and for medicines. Electricity systems that started in fine shape have fallen into disrepair and failed to bring the expected benefits because lagging adjustments of tariffs to inflation have impeded proper maintenance and have rendered it impossible to borrow to keep capacity in line with the growing demand. Road projects entailing large capital investments financed by borrowing have similarly ended up failing to deliver their expected benefits, owing to financial shortfalls that
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precluded adequate maintenance and repair. In just about all these cases there was no intrinsic deficiency in the project itself; instead, some sort of institutional rigidity was at fault. But experience tells us that it is the job of a wise project appraisal process to try first to foresee and then to forestall such financial difficulties.

It should be clear from the above that in cases where stakeholder interests play a significant role, and/or where the viability or success of a project in vulnerable to avoidable financial contingencies, these elements should be taken into account at each successive stage of the appraisal process. It is not prudent to leave them to be dealt with, almost as an afterthought, only at or near the final stage. This is why we, in this book, have tried to present an appraisal that permits the analyst to focus on economic, financial, and stakeholder considerations within a substantially integrated framework.

2.3 Pre-Feasibility Study

The pre-feasibility study is the first attempt to examine the overall potential of a project. In undertaking this appraisal, it is important to realize that its purpose is to obtain estimates that reflect the right “order of magnitude” of the variables in order to roughly indicate whether the project is attractive enough to warrant more detailed design work.

Throughout the appraisal phase and, in particular, at the pre-feasibility stage, estimates which are clearly biased in one direction are often more valuable than mean estimates of the variables, especially when these latter are only known with significant uncertainty. In order to avoid acceptance of projects based on overly optimistic estimates of benefits and costs, the pre-feasibility analysis should use estimates with a downward bias for benefits and an upward bias for costs. If the project still looks attractive even in the presence of these biases, then it stands a good chance of passing a more accurate evaluation.

The pre-feasibility study of any project will normally cover six different areas. These can be summarized as follows:
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a) **Demand module** in which the demand for the goods and services, and prices, or the relative needs of social services are estimated, quantified, and justified.

b) **Technical or Engineering module** in which the input parameters of the projects are specified in detail and cost estimates developed.

c) **Manpower and administrative support module** in which manpower requirements are specified for the implementation as well as for the operation of the project and sources of manpower identified and quantified.

d) **Financial/Budget module** in which the financial expenditures and revenues are evaluated along with an assessment of the alternative methods of financing.

e) **Economic module** in which the project’s economic costs and benefits as a whole are appraised from the viewpoint of the economy.

f) **Environmental Assessment module** in which the various environmental impacts of the project are identified, evaluated and proposals developed for their mitigation.

g) **Stakeholder module** in which the project is appraised from the point of view of who receives the benefits and who pays the costs of a project. Where possible, quantification should be made to determine by how much each of these groups benefits or pays.

Whenever possible, the pre-feasibility study should utilize secondary research. Secondary research examines previous studies on the issues in question and reviews the specialized trade and technical journals for any important data that may be relevant to the appraisal of the project. Utilization of the research on commodities and technical aspects of projects from institutions or associations disseminating pertinent information is essential. Most technical and marketing problems have been faced and solved before by others. Therefore, a great deal of information can be obtained quickly and cheaply if the existing sources are utilized efficiently.
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a) Demand Module

The demand module should be thought of as a first attempt at serious quantification of the benefits of the project. If the output of the project is directly marketed (like telephone services), the module may consist of projecting the likely time path of its economic price (in real terms), and estimating the quantity demanded along that price path at each point in time. If the project provides a service (like highway services), that might but need not be subject to a user charge, the appropriate procedure is to go directly to an economic evaluation of benefits and costs in real terms, and then consider whether user charges are appropriate, how high they should be, and how they should be administered. In such cases, the willingness to pay of the beneficiaries is a key element in the estimation of benefits, even though total benefits may differ significantly from estimated toll collections. At the other extreme, there are projects in which the estimated user-demand plays little or no role. Typically in these cases, the value of the product of the project is established in other ways. Sometimes the value of the “output” of the project is seen by all substantially exceed its cost. In these cases resort is made to a fundamental economic principle: one should not attribute to any project a benefit that is greater than the cost of the least-cost alternative way of achieving the same result. Often in such cases a “standard” alternative exists (for example, thermal electricity generation in the case of electricity), whose costs are easily determined. Then the benefit of “our” project would be considered to be the saving of costs that it provides, as against the costs of the “standard” alternative.

For the demand analysis of tradable goods, the key variables are the prospective levels and likely trends of their prices, relative to the domestic price level (and to that of tradable goods generally). Here one can often find market analyses by the relevant producer associations and professional experts with projections of prices and world output.

For the demand analysis of a product to be sold in the domestic market, it will be more important to begin primary research at the pre-feasibility stage of the project appraisal. The analysis will need to assess the overall marketing plan of the organization undertaking the project. The potential users of that product will often have to be surveyed before an accurate
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picture of its potential demand can be determined. If the product is to be sold in a
competitive environment, then a judgment should be made as to how the competitors in
the market are likely to react. Such a judgment can be based on reviews of past actions, as
well as the institutional strengths and weaknesses of the competitors. Ultimately, the demand
for the project’s output will depend on the nature of the product, the competitive advantages
of the project in supplying the product and the resources spent to market the output.

In the case of public monopolies such as public utilities, government policies themselves
may be important in determining the demand for the output. Extension of electricity supply
to new rural areas and the development of new industrial complexes can have an important
bearing on the future demand. The growth in the demand for the output of a public utility can
often be projected accurately by studying the relationship over time of demand with respect
to variables such as disposable income, industrial output, household formation and relative
prices. The study of growth in demand experienced by utilities in other countries with similar
circumstances can also help to provide a good basis for projecting future trends.

The output of this module, if it is to be a commercial project, should be a set of forecasts of
the following variables for the duration of the project:

1) Quantities of expected “output” of the project as well as the time path of associated
   real benefits.
2) Quantities of expected sales and prices for goods to be sold domestically and not in
   competition with internationally traded goods.
3) Sales taxes and export taxes that are expected to be paid on the project’s output of
   the traded goods.
4) Sales taxes to be paid on goods not traded internationally.
5) Subsidies to be received on the basis of production, sales, exports, etc.
6) Government regulations (such as price ceilings and floors, or quotas), affecting the
   sales or price of the output.
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7) Product trends in terms of technological developments and the expected product cycle.

8) All trade restrictions that are not created by government regulation must be identified and their impact should be quantified.

b) Technical or Engineering Module

In this module, secondary research can be used very effectively. Engineering firms and technical experts in a field usually have considerable experience in other projects that have used either identical technology or similar techniques. Often there are many consulting firms or government agencies that have technical expertise in a specific area. The most important rule to follow when using outside expertise in assisting with feasibility studies, is that the consulting group being employed to provide this information must be informed that it will not be considered for the design or management of the facility in the design and implementation phase. It is critical to avoid placing the consultants used in the appraisal of a project in a position where they have a conflict of interest. Consultants should be hired at the appraisal stage to provide truthful information based on their experience in the past. The authorities also may wish to indicate to them that if their estimates for the current project prove to be accurate then they will receive favorable attention when the contracts are being let on future design activities of other projects. The consultants used to assist in the preparation of the appraisal should also be retained to check and approve the design and cost estimates developed by the group that has been given the task of preparing the final detailed plans.

If this procedure is not followed then there will be a conscious effort on the part of the engineering or technical consultants to underestimate costs in order to get the project approved. Once the project is approved, they get an opportunity to obtain the more profitable task of preparing a detailed design of the project. Of course, the worst possible approach is to ask for free advice at the appraisal stage on the basis that the outside experts will be given a chance to do further work for hire if the project is attractive. It is a sad commentary on the
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performance of many governments in this area to note that these last two procedures are the ones often followed.

The output from the technical module of a pre-feasibility study should obtain the following information:

1) The quantities of inputs by type which will be required for the construction of the project.
2) The likely time paths of the real prices of these inputs and their probable sources of supply.
3) The time paths of the labor requirements of the projects, for each occupation and each category.
4) The physical input requirements for the operation of the project by year and by volume of output.
5) The likely sources of supply for these inputs and the assumptions on which the time paths of their future real prices are based.
6) Information on the technological life of the project.
7) The nature and extent of the impacts that the project is expected to have on the environment.

c) Manpower and Management Module

Project appraisal, to be effective, must not confine itself to examining the financial and economic costs and benefits under the assumption that the project can be built and delivered operationally and on time. This assumes a degree of management capacity that simply does not exist in many situations. Many projects have failed because they were undertaken without making sure the management and administrative expertise was available to be able to deliver the project as specified.
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This module must reconcile the technical and management requirements of the project with the supply constraints on manpower available to this project. If they cannot be reconciled, then the project should not be undertaken. A careful study of the labor markets should be made in order to ensure that the estimates of expected real wage rates to be paid are soundly based and that the planned sources of manpower are reasonable in the light of labor market conditions.

In general, manpower requirements should be broken down by occupational and skill category and these needs should be evaluated in terms of the possible sources from which they might be met. Where difficulties are foreseen, this information should be passed to the technical module so that possible revisions of the timing of the project can be considered.

d) Financial/Budget Module

The financial/budget module provides the first integration of the financial and technical variables that have been estimated by the previous modules. A cash flow profile of the project will be constructed which will identify all the receipts and expenditures that are expected to occur during the lifetime of a project. Even in the pre-feasibility stage, an attempt should be made to provide a description of the financial flows of the project that identifies the key variables to be used as input data in the economic and stakeholder appraisal.

Initially, the financial cash flows will be expressed in terms of nominal prices overtime because certain key variables such as taxes and debt repayments are calculated in terms of their nominal values. These nominal values are then converted into their real value equivalents by dividing by a numeraire price index. It is usually necessary to examine a project financed performance over time in terms of the real values of the financial variables in order to determine its financial robustness over time and, hence, its financial sustainability.
Because of the need for estimates of particular variables (e.g., foreign exchange requirements) for the purpose of making economic and stakeholder project appraisals, the level of financial detail required is considerably greater than what is usually found in the financial appraisal of a private sector project. The financial module should answer a series of basic questions concerning the financial prospects and viability of the project. Four of the most important of these questions are outlined below:

1) What relative degrees of certainty do we place on each of the revenue and cost items in the financial analysis? What factors are expected to affect these variables directly and in what way?

2) What sources of financing will be used to cover the cost of the project? Does this financing have special features, such as subsidized interest rates, grants, foreign equity or loans?

3) What is the minimum net cash flow required by this investment to be able to continue operations without unplanned requests being made to the government treasury for supplementary financing?

4) Does the project have a large enough net cash flow or financial rate of return for it to be financially viable? If not, what sources of additional funds are available and can be committed to assist the project if it is economically and socially justified?

If any one of these questions points to future difficulties then adjustments should be made in either the design or financing of the project to avoid failure.

e) Economic Module

This module attempts to cover the full benefits and costs of a project in society or the economy, as flows through time, expressed in real terms.

The distinction is made between the benefits and costs of the project as seen by the “project owner” and those perceived by “the economy as a whole”. Here one is concerned with such
items as taxes, subsidies and other distortions flowing between the government and the project, with benefits that accrue to the project’s users (in the form, say, of consumer surplus), and with externalities like pollution and congestion, where costs are borne by people other than their specific perpetrators. Typically, a financial analysis will incorporate only the financial flows accruing to or paid by the project. Thus, the key questions are outlined below:

1) What are differences between financial and economic values for each of the important variables? What causes these differences?
2) With what degrees of certainty do we know values of these differences?
3) What is the expected value of economic net benefits?
4) What are the probabilities for different levels of net economic value being realized?

f) Environmental Impact Assessment Module

The environmental impact assessment module brings together the information from both the demand module and the technical module to assess the likely environmental impact of the project and to determine the most cost-effective ways of mitigating the negative impacts. The analysis undertaken in this module in many instances should quantify the physical impacts of the project on the environment and attempt to measure the economic costs and benefits of these impacts. In the assessment of the negative impacts there is a need to consider the trade-offs that might exist between the benefits arising from the project and the environmental damage that is likely to occur. The alternatives and their economic cost for controlling the environmental damage should be compared to the economic cost of the damage that will be incurred. When the environmental costs are uncertain but have the potential of inflicting significant damage, other alternative ways of supplying the good or service that do not have the same potential for inflicting the environmental costs must to be evaluated as alternatives to the project under consideration.

In the cases where the benefits or costs (and damages) cannot be quantified but the impacts are considered significant, they should be listed, substantiated and properly documented in
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the analysis. For those intangible or qualitative items, they may have significant impacts on decision-making.

g) Stakeholder Module

The stakeholder analysis is concerned with the identification and wherever possible, the quantification of the impacts of the project on the various stakeholders. These include the impact of this project on the well-being of particular groups in society, since seldom does a project benefit everyone in a country proportionally. Political factors should be identified as well as long-run impacts of the project on the community, which are not reflected by the changes in income. While this aspect of the appraisal may be less precise than the financial or economic analysis of a project, the stakeholder evaluation should be tied to the same project factors that are expected to reduce poverty or address the basic needs of poorer members of the community.

An illustrative set of questions to be asked by the analyst when undertaking a stakeholder appraisal of a project is as follows:

1) Who are the beneficiaries of this project and who is expected to bear the costs?
2) In what ways do those who benefit from the project receive those benefits and how do those who bear the costs pay?
3) What other political or social impact is this project expected to generate? How?
4) What are the basic needs of the society that are relevant in the country? What impact will the project have on basic needs?
5) By what alternative ways (and at what costs) could the government obtain social results similar to those expected from this project (or program)?
6) What are the net economic costs of undertaking these alternative projects or programs? How do their costs compare with those incurred by the project in order to achieve the same political or social objectives?
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In evaluating the social impact of a project, there are two important principles that should be remembered. First, the reasoning should be clear as to how this project is going to produce the social impacts attributed to it. Secondly, as the government is usually undertaking many projects and programs to reach its social objectives, we must compare the cost-effectiveness of this project with, at least, a benchmark of the costs which are incurred by the other policy instruments available. Only if this project is as cost-effective as other projects and programs in achieving the social objectives, should an additional benefit be attributed to it.

The set of questions, which have been outlined for a financial-economic-social appraisal of a project, makes it clear that it is our aim to categorize costs and benefits from the point of view of society as a whole. However, we should recognize that some costs and benefits will be financial and directly generated within the project, and others will be financial but external to the project. We should also emphasize that some costs and benefits will be measurable and valued at an imputed price, and others will be identifiable but measured and/or valued with some degree of uncertainty. The variety of types of costs and benefits should be borne in mind in interpreting the results of a social project appraisal. In particular, we should not be misled by the apparent simplicity of the net economic or social present values expressed as real numbers.

2.4. Feasibility Study

After completing all the modules of the pre-feasibility study, the project must be examined to see if it now shows promise of meeting the financial, economic, and social criteria that the government has set for investment expenditures. A sensitivity analysis must be made on the project to identify the key variables which determine its outcome.

The function of the feasibility stage of an appraisal is to improve the accuracy of the measures of key variables if this particular project indicates it has a potential for success. In order to improve the accuracy, more primary research will have to be undertaken and perhaps a second opinion sought on other variables.
The important risk variables that affect the project’s performance need to be identified. The methods of risk reduction, allocation and management need to be developed and applied to the identified risk variables as part of the feasibility study.

It is at the end of this stage that the most important decision has to be made as to whether the project is financially attractive to all interested parties in activity and if it should be approved. It is much more difficult to stop a bad project after the detailed (and expensive) design work has been carried out at the next stage of appraisal. Once sizable resources have been committed to prepare the detailed technical and financial design of a project, it takes very courageous public servants and politicians to admit that it was a bad idea.

2.5 Detailed Design

After the feasibility study, if the decision-makers give their approval to the project, then the next task being is to develop a detailed project design and make detailed arrangements for financing the project. Preliminary design criteria must be established when the project is identified and appraised but usually expenditures on detailed technical specifications are not warranted at this time. Once it has been determined that the project will continue, the design task should be completed in more detail. It involves setting down the basic programs, allocating tasks, determining resources and setting down in operational form the functions to be carried out and their priorities. Technical requirements, such as manpower needs by skill type should be determined at this stage. Upon completion of the blueprints and specifications for construction of the facilities and equipment, then the operating plans and schedules along with contingency plans must be prepared and brought together in the development of a formal implementation plan.

In summary, the detailed design stage of a project appraisal is the point where the accuracy of the data for all the previous modules is improved to the point where an operational plan of action can be developed. Not only is the physical design of the project completed at this stage, but so is the program for administration, operating, and marketing.
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When this process is completed, the project is again reviewed to see whether it still meets the criteria for approval and implementation. If it does not, then this result must be passed on to the appropriate authorities for rejection.

2.6 Project Implementation

If the appraisal and design have been properly executed then the selection of the project for implementation should only entail the completion of negotiations to finalize the conditions for financing and the formal approval of the project. The formal approval will require the acceptance of funding proposals and agreement on contract documents, including tenders and other contracts requiring the commitment of resources.

The implementation of a project involves the coordination and allocation of resources to make the project operational. The project manager will have to bring together a project team including professionals and technicians. This team will in turn have to coordinate the various consultants, contractors, suppliers and other interested agencies involved in putting the project in place. Responsibility and authority for executing the project must be assigned. This will include the granting of authority to make decisions in areas related to personnel, legal and financial matters, organization and administration. Proper planning at this stage is essential to ensure that undue delays do not occur and that proper administrative procedures are designed for the smooth coordination of the activities required for the implementation of the project.

The appointment of a project manager means that responsibility for implementation will fall within his or her jurisdiction. This will involve decisions regarding the allocation of tasks to groups within the organization and decisions regarding the procurement of equipment, resources and manpower. Schedules and time frames need to be established. Control and reporting procedures must be activated to provide feedback to policy makers and the project manager.
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When the project nears completion preparation must be made for phasing out of the construction activities and hand over to the new operational management. The project completion will necessitate a scaling down and dismantling of the project organization. A transfer of project personnel and equipment to other areas of the operation will be required. These activities may occur over a considerable period of time. However, as the project becomes operational it is essential that the skills, plans and controlling organization be available to carry on with the function of the project in order to avoid excessive start up costs which can easily undermine the overall success or failure of the project.

2.7 Ex-Post Evaluation

In the short history of formal cost benefit analysis or project appraisal considerably more effort has gone into the pre-evaluation of projects than into the review of the projects actually implemented. For the development of operational techniques of project appraisal it is essential to compare the predicted with the actual performance of projects. In order that this review of the strengths and weaknesses of implemented projects be of the maximum value to both policy makers and project analysts it is important that some degree of continuity of personnel be maintained within the organization’s project evaluation teams through time.

In carrying out this evaluation a review of the administrative aspects of the project development should be made immediately after the project becomes operational. The managers of the operational phase of the project must be made aware of the fact that an in-depth evaluation of the project’s performance is to be carried out through time. In this way the necessary data can be developed through the normal financial and control activities of the operation to enable an evaluation to be carried out at minimum cost.

The ex-post evaluation helps not only to assess the performance of a project and to give an ultimate verdict on its contribution to the country’s development but also to identify the critical variables in the design and implementation of a project that have contributed to its success or failure. The ex-post evaluation helps an organization to repeat the successful experiences and to eliminate the failures.
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REFERENCES


