

project planning and management series

PN-AAR-458

LAN:37110

ACKNOWLEDGEMENT

The Project Planning and Management Series consists of a set of manuals and associated modules presenting practical approaches, tools and techniques for project planning and management. (See list on back cover). A product of the Government of Jamaica/USAID National Planning Project (1976-1980), the series was developed by the Project Development Resource Team (PDRT) of PAMCO for use in "action-training" workshops and reflects extensive experience in training and project development. All present PDRT members are contributing authors and have worked together in writing, revising and publishing the series. Special credits are due to Dr. Merlyn Kettering for design and development of the series; Dr. Bruce Brooks for writing final versions of many modules; Mrs. Marjorie Humphreys for assuming primary editing and production responsibility and for organizing draft papers into more useful materials; Mr. Lascelles Dixon, head of PDRT since 1979, for designing the cover and improving many of the illustrations; and Mrs. Christine Hinds and Miss Linette Johnson for typing the drafts and final manuscripts. Any comments on the series and its usefulness are welcome.

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March, 1980

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Published by:

The Project Analysis & Monitoring Co. Ltd. (PAMCO)
Inter-Continental Hotel, 4th Floor
Kingston, Jamaica, W.I.

MODULE 17

PROJECT COSTS AND BENEFITS¹
Conrad Smikle

A. **PREREQUISITES:** Module 13 - Project Technology Analysis

B. **DISCUSSION:**

Project costs are classified according to the period in which they occur during the life of a project. Project costs therefore fall into two groups.

(a) Capital or Investment, and

(b) Operating and Maintenance or Recurrent.

C. **PURPOSE:**

To allow for the *appraisal* of the project against given criteria.

D. **USE:**

To provide the framework of a technique for project planning.

E. **DEFINITIONS:**

Capital or Investment Costs

These costs are incurred during the investment period. The investment period is the duration of time required to construct the project and make it operational. It is the period during which the investment is made.

The start of the investment period is usually determined by the first capital input into the project and is completed when the investments are completed. The investment period is logically the first few years of project implementation, and for certain projects, may be less than a year in duration.

Investment costs, therefore, constitute the costs of capital items such as machinery and equipment, land, buildings and infrastructural development. They also include the cost of construction and installation as well as other charges which may be due to the investment

operation. For example, the cost of permanently clearing the site is an investment cost. Similarly, legal and consulting fees as well as interests payments and contingencies during construction are regarded as investment costs.

Operating and Maintenance or Recurrent Costs

These costs constitute the expenditures on goods and services needed for operation and maintenance of the project. These costs are calculated on an annual basis and include such items as salaries and wages for project employees, cost of materials and supplies needed for operating the main works of the project. Included also are costs of repairs and maintenance of capital items, depreciation allowances as well as annual interest charges, insurance and amortization costs during operation. As noted earlier, operating costs are incurred during the operating period. This is the period over which benefits are expected to flow as a result of the investments. This period usually follows the investment period but the two periods may at times overlap as benefits may start to accrue before the investment period ends.

The length of the operating period is influenced by the expected technical life of the capital input. For some projects, while the technical life of the capital input is quite long, the economic life of the project is expected to be short because of obsolescence. This is particularly true for certain industrial projects. For agricultural projects, however, it is not expected that rapid changes in technology will make major investments obsolete over a medium-term period of 20-25 years.

The following table lists capital and operating costs for a specific project in horticulture.

CAPITAL AND OPERATING COSTS FOR AN HORTICULTURAL PROJECT

*Items of capital costs**Land, Buildings and structures*

1. Land
- Buildings - office, store,
Kitchen
- Other structures - reserve
- Water tank, shade houses
- Sheds, fences.

Site Development

- Land Clearing
- Levelling site
- Installing pipes and pumps
- Making nursery beds, etc.

3. *Machinery and Equipment*

- Office equipment and fixtures
- Kitchen equipment and fixtures
- Garden equipment - booster pumps
- Mist blowers, filters, sprinklers
- Irrigation pump,
- Garden tools and protective equipment

Vehicles and other equipment

Tractor.
Truck
Land rover
Motovator
Harrow
Hand tractor and trailer

*Planting materials**Items of Operating costs*

Salaries,
Wages (full time and casual)
Insurance
Taxes
Utilities - Electricity , water, telephone
Office supplies
Farm Supplies - chemicals, fertilizers, diothene
bags, bagasse, petrol
Repairs and maintenance.
Depreciation allowances.

Joint Costs

Joint costs refer to the case of multipurpose projects. An example of a multipurpose project is a hydro-electric water supply project. This project has the double objective of producing hydro-electricity and domestic water supply. This situation presents a problem as to how to distribute capital and recurrent costs among the two purposes. In these projects the allocation of costs among the various purposes is essential in order to arrive at appropriate rates to be charged for water and electricity. The most common technique used in apportioning these costs is the "SEPARABLE COST REMAINING BENEFITS."¹

¹Gittinger, J. Price; Economic Analysis of Agricultural Projects. Economic Development Institute - World Bank, 1974.

Phasing of costs

The capital and recurrent costs of a project should be phased on an annual basis. Phasing of these costs will depend on the scheduling of project activities. The phasing of capital costs will also show how the total investment will be distributed over the implementation period. Such phasing will have direct effect on the cash flow and hence the financial and economic returns of the project.

Local and Foreign Currency Costs

In most cases, a part of the investment and operating costs will be in the form of foreign currency. For financing arrangements as well as for the purposes of financial and economic analysis it is essential to show separately the local and foreign currency component.

Project Benefits

Generally, projects can be divided into three functional categories.

- (a) Directly Productive, as in Industry and Agriculture
- (b) Infrastructural, such as power, transport, communications, etc.
- (c) Social, such as health, education and welfare.

a) Directly Productive Projects

The direct benefits accruing from these projects are easiest to measure and value, since they represent the value of the outputs of these projects. These benefits are calculated by multiplying the number of physical outputs by the price of each output. For example, an agricultural project producing 20,000 tons of grain per year would have direct financial benefits of 5 million dollars per year assuming the average unit price of grain is \$400 per ton. Similarly, an industrial project, producing 10,000 cases of baking flour, 5,000 cases of cornmeal and 20,000 tons of animal feed annually would have financial benefits as calculated in TABLE 11.

TABLE 11

DIRECT FINANCIAL BENEFITS FROM A THEORETICAL FLOUR MILL PROJECT

Outputs	Price/Unit \$	Value \$
<i>Baking Flour</i> 10,000 cases	20	200,000
<i>Cornmeal</i> 5,000 cases	15	75,000
<i>Animal Feed</i> 20,000 tons	120	2,400,000
TOTAL		2,675,000

It is to be noted that, like project costs, project benefits are calculated annually. The value of \$2.675m therefore would represent the financial benefit of the above project in the year in which that value occurred.

b) *Infrastructural Projects*

The benefits from these projects vary according to the nature of the infrastructure. The direct financial benefits accruing from infrastructural projects such as power plants, domestic water supply or improved marketing facilities take the form of fees paid by consumers or users of these facilities. Other types of direct benefits that may accrue to these projects include:

- (a) cost reductions - In marketing and highway projects, the "user cost savings" which accrue, will appear as direct benefits to these projects.

- (b) losses avoided - One of the objectives of many agricultural marketing projects is to reduce post-harvest losses. When this reduction is measured and valued, it is treated as benefit to the project.

Certain infrastructural projects like rural feeder roads will normally result in an increase in agricultural output in the project area. The value of this increase in agricultural production may also be treated as benefits to the given project.

c) Social Projects

The benefits from these projects are often quantifiable but difficult to value. Hence the benefits from these projects are usually described as number of lives saved or number of people served as in health projects; the number of teachers graduated as in an education project. Similarly, a welfare project could have as its benefits the number of people being assisted by a social welfare programme.

Other Benefits

Whether the project be a directly productive project, an infrastructural project or a social over-head project, there are a number of indirect benefits which may accrue to these projects.

Two common such benefits are employment opportunities and Net Foreign Exchange earnings. These benefits may be stated in quantitative terms, number of jobs created per million dollars of investment in the case of earned as in the case of foreign exchange benefits. Some other indirect benefits that may accrue to any project include development of local expertise and improvement in technology. An income distribution impact in the case of co-operatives and farm settlement projects may also be treated as other benefits.

Project Planning and Management Series.

MANUAL - I Planning for Project Implementation
MANUAL - P Project Planning
MANUAL - M Project Management
MANUAL - PF Pioneer Farm Implementation Planning

MODULES

1. Defining Project Objectives (Objective Trees)
2. The Logical Framework
3. Work Breakdown Structure
4. Activity Description Sheets
5. Project Organization
6. Linear Responsibility Charts
7. Project Scheduling - Bar Charts
8. Bar Charting for Project Control/Scheduling
9. Project Scheduling - Network Analysis
10. Milestones Description Charts
11. Resource Planning & Budgeting
12. The Role of PAMCO
13. Project Technology Analysis
14. Demand Analysis
15. Market Strategy Analysis
16. Project Area Analysis
17. Project Costs & Benefits
18. Project Profile
19. Financial Analysis
20. Cash Flow Analysis
21. Discounting
22. Net Present Worth Analysis
23. Cost-Benefit Analysis
24. Benefit-Cost Ratio Analysis
25. Internal Rate of Return
26. Social Analysis of a Project
27. Economic Analysis of Projects (including Border Pricing)
28. Financial Statements & Ratios
29. Project Selection & Ratios Analysis
30. Brainstorming
31. Decision-making System for Projects
32. Project Institutional Environmental Analysis
33. Ecological Analysis for Projects
34. Introduction to Contracts, Jamaican Contract Documents & Tendering Procedures
35. Selection & Use of Consultants
36. Project Documents for Planning & Implementation
37. Report Writing for Projects
38. Project Files
39. Formats for Pre-Feasibility & Feasibility Studies
40. Motivation of Employees and Personnel Evaluation
41. Design of a Project Management Control System
42. Evaluating & Forecasting Project Progress & Performance
43. Project Termination
44. Introduction to Lending Agencies
45. Organizing and Conducting Conference Meetings
46. Withdrawal of and Accounting for Loan Funds in the Financing of Projects