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Project Planning

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PREFACE AND ACKNOWLEDGEMENTS

This Manual was prepared by the Project Development Resource Team (PDRT of PAMCO).

The authors of this Manual are indebted to many who have published materials in the past on Project Management Planning and Implementation. Many multigraphs, multiliths, bulletins, circulars and books were reviewed during the months while the PDRT were preparing materials used in training courses with persons responsible for formulating and implementing projects in a sizeable number of Jamaica government agencies, statutory bodies, and ministries.

Many of the Project Management tools that others have found useful and subsequently put in written form, were used as the course materials for training here in Jamaica. But, the PDRT team soon determined that these materials are most readily learned in training situations when they were used on actual projects in which the trainee become involved. This Manual shows how the tools are applied on real Jamaican projects. The PDRT found this "action-training" approach to be a very effective teaching and training model. The participants quickly learn, own and adapt the tools and techniques because of their obvious relevance and applicability, and at the same time projects are actually moved forward during the training period. Thus, both trainees and actual projects benefit from the action-training approach. Based on the training experience of two years, the team strongly recommends this approach in other countries where project management training is attempted. From the trainees viewpoint, it is an exciting, but demanding approach to training and it is quickly accepted because it helps to speed up the actual development project implementation process. This is the crux of the development effort in developing countries.

Much of the training materials used by PDRT to construct this Manual came from four primary sources. These publications are highly recommended to anyone interested in developing and using training materials on project management.

United Nations, The Initiation and Implementation of Industrial Projects in Developing Countries, A Systematic Approach, U.N., New York, 1975.

J. Bainbridge and S. Sapirie, Health Project Management, A Manual of Procedures For Formulating and Implementing Health Projects, World Health Organization, Geneva, 1974.

Peter Delp, et.al., Systems Tools for Project Planning, PASITAM, Indiana University, Bloomington, Indiana, 1977.

D. Cleland and W. King, Systems Analysis and Project Management, Second Edition, McGraw-Hill, New York, 1975.

The PDRT team is indebted to other who gave assistance previous to and during the preparation of this manual. Foremost among these persons were the Project staff from all over Jamaica who attended PDRT training courses and assisted the PDRT in applying the management tools to the management problems facing them in planning and implementing the Projects. These officers produced

the actual and illustrative working documents that can be applied to other projects. There are also the many officials within the Ministry of Agriculture, particularly those in the Production Unit, who have supported and assisted in this training effort. In addition, the Programme Officers of USAID and the Director of Projects Division (now PAMCO), Ministry of Finance, have encouraged the team to prepare and formalize these and other training materials so they can be used by other resource persons who are given the responsibility of training project management personnel in various segments of the government and in the private sector. Last, but by no means least, is the Secretarial Staff of PAMCO who worked diligently through many drafts to put the material in publishable form. Without the assistance and encouragement of all the persons mentioned above, the publication of this material would not have been possible.

We sincerely hope that the material will be useful to all Project Managers. The Project Implementation Planning Steps introduced here, have broad applicability and can be used and adapted by officials on projects that are faced with the complex problems that surround project management.

PAMCO
June, 1979.

ACKNOWLEDGEMENTS

The Project Planning and Management Series is a product of the Government of Jamaica/USAID National Planning Project (1976/1980). It was developed by the Project Development Resource Team (PDRT) for use in its "action-training" programme and presents practical approaches and tools for project planning and management. PDRT action-training brings teams and persons assigned to live projects into workshops, seminars and consultations, to acquire the specific knowledge and skills needed to perform their particular responsibilities with respect to "live" projects. During action-training, participants complete work on the "live" projects of their sponsoring organizations under the guidance of the Resource Team. In this way, projects are developed and moved forward while officers are being trained in job-relevant aspects of planning, analysis and management.

The publication of a series of this scope is a long and difficult process. All present PDRT members, listed as contributing authors, have worked together in writing, revising and publishing the series. The significant contributions of specific members deserve special mention. Dr. Merlyn Kettering, as long-term project advisor, guided the action-training programme and designed and developed the series. Dr. Bruce Brooks was responsible for final versions of many modules. Mrs. Marjorie Humphreys assumed primary responsibility for editing and production, and deserves much credit for organizing and clarifying the materials. Mr. Lascelles Dixon has headed the PDRT since 1979 and also deserves credit for the cover designs and for improving many of the art illustrations.

The series is the result of extensive experience in project action-training by the PDRT since 1976. Many persons in Jamaica, United States Department of Agriculture (USDA) and USAID have given support to the project and encouragement to this publication. In particular, Mr. Morris Solomon of the Development Project Management Center (DPMC) of USDA was responsible for the original project design and for supplying publications and giving encouragement and advice throughout the project. The many participants of the workshops and seminars have also contributed significantly to the form and content of the series.

Finally, credit is due to the total staff of PAMCO who have given support, constructive criticism and encouragement to the development of this series.

The publication of this series is only a beginning of the development of relevant and practical planning, analysis and management materials. There are gaps; there are areas needing improvement and revision. The series is intended to be used and to be useful. Use in action-training and practical application to project development will result in revision, expansion and adaptation. All comments on the usefulness, accuracy, and relevance of the materials are welcome. The efforts of all preparing and publishing the Project Planning and Management Series are justified if it helps to develop our national capabilities to design and carry out realistic and successful development projects.

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FOREWORD

Introduction

One of the greatest challenges of this decade will be the effective management of increasingly scarce national resources to meet development objectives. As discrete sets of activities utilizing limited resources to achieve specified objectives within a definite time frame, projects are basic building blocks for the development programmes of nations and lending agencies. If projects are to be realistically designed and successfully implemented, there must be a national capability and commitment to manage and control financial, physical and human resources so their contributions are channelled toward the aims of their parent organizations and societies. A critical test of national maturity is the capability to plan for and effectively manage the use of resources through projects.

The Project Planning and Management Series presents practical approaches, tools and techniques for the formulation and implementation of sound projects. The series consists of a set of manuals on planning, planning for implementation and management along with associated modules explaining specific tools and techniques relevant to various functions of project development. The series can be used as a reference and guide for persons with responsibilities on "live" projects. It is also of interest as a text for persons studying project planning and management. All concepts, approaches, tools and techniques presented have practical relevance to projects and many have broader management applications as well.

The Project Planning and Management Series is based upon experience gained through the extensive use of action-training for project development. The objectives of the project were to (1) increase the flow of development projects, while (2) increasing Jamaican capabilities in planning and managing projects. The "action-training" approach was introduced and tested through the activities of the PDRT which was instituted by the project.

Action-Training

Action-training is carried out within the organizational setting of the participants and uses "live" projects so that the workshops are strongly oriented to operational problem-solving within the context of actual forces and resources of the situations in which projects must succeed. Action-training is a practical response to the pressures of a developing society where scarce management skills do not permit the release of persons from organizational responsibilities to attend long traditional training courses.

The PDRT action-training programme brings teams and persons assigned to live projects and with actual responsibilities into workshops, seminars and consultations and gives them the specific knowledge, guidance and skills required to perform their assignments. In this way, projects are developed and moved forward while project personnel are being trained in relevant aspects of planning, analysis and management of both immediate and future benefit for the individual and the organization.

Action-training on projects utilizes the immediate application of approaches, tools and techniques on "live" projects to ensure that:

- (1) the sponsoring organization and the nation benefit through observable project progress;
- (2) the training is operational and relevant within the real organizational context;
- (3) the participants have understood the concepts, tools and techniques well enough to apply them in actual situations; and
- (4) the participants benefit by mastering new skills and are rewarded by promoting project progress.

Action-training is best instituted where it supports rational and co-ordinated systems of project development, i.e., planning, implementation, monitoring and decision-making. Different groups of persons have responsibility for the various aspects of a project throughout its life. Some persons identify projects, others plan and prepare feasibility studies; others appraise; others select; others negotiate loans; others manage contracts and consultants; others manage; others monitor and so on.

Action-training is used to give persons and teams the specific knowledge and skills necessary to understand their responsibilities within the total project system and to be able to perform their roles effectively. It focusses specifically on what persons need to know to do their jobs and reinforces their understanding by testing the application of new skills on live projects.

An action-training workshop generally follows a simple formula for each topic and technique introduced. An introductory presentation is followed by a simple exercise to illustrate the concept and demonstrate its application. This is then followed by a work period during which participants work on actual assignments on live projects in consultation with the PDRT. The application to live projects reinforces the learning, permits an in-depth exploration of its applicability, tests relevance for this situation, and permits adaptation to fit the actual context, assignment, and experience of the participants. The live projects are not simulations, but actual undertakings of the respective organizations of the participants and represent assignments which are integrated into their normal duties. It is usually necessary to follow a workshop with site and field consultation to see that assignments are completed and that the tools are being used for project development and problem-solving.

PDRT carries out action-training in several ways:

- (1) Project Workshops conducted over several weeks, which result in the completion of a specific stage of project documentation or development; such as a completed Project Profile, Implementation Plan or Management Information System.

- (2) Consultation Workshops lasting several days over a period of time, which help a project team solve specific problems in project design, analysis, implementation, management, monitoring, or evaluation.
- (3) Seminars lasting one day, which introduce specific or general concepts and techniques to persons with particular administrative or technical responsibilities involving these skills.

Use of the Series

The Project Planning and Management Series is structured as a support to action-training. Different persons perform different functions and roles with respect to projects and therefore require different skills. Some persons must be able to perform sophisticated financial and economic analysis, while others may need only elementary knowledge of how to construct a cash flow. Some must focus on the clarity of objectives while others must be able to prepare definitive market and technical plans. Some need to be able to analyze while others must formulate. Some must be project managers, while others are executives. Some must manage contracts and consultants, while others monitor project performances, and so on. This requires that some basic concepts and skills be taught to most project personnel and that specialized skills relevant to specific responsibilities and roles must be taught to the different teams and groups. For this reason, the series is divided into distinct manuals and modules so that the appropriate concepts, tools and techniques can be selected for direct relevance to the specific functions of participants or the specific project problems being addressed by the action-training.

As a project is moved through its life from identification and conception, through planning and approval to implementation and termination, different approaches, knowledge and tools are relevant. The Project Planning and Management Series can be used because of its flexible structure to give the appropriate knowledge and skills to persons with different roles and responsibilities in the project life, e.g., planning, analysis, management, monitoring, contracting, control, and so on. The following examples illustrate some applications of action-training by PDRT using the series.

1. A Project Profile Workshop - conducted over three weeks for project teams with responsibility for the first identification planning document on a project idea. This workshop is conducted using Manual P -- Project Planning with an assortment of modules, including:
 - 1 - Project Objectives; 2 - Logical Framework; 5 - Project Organization; 7 - Project Scheduling--Bar Charts;
 - 13 - Project Technical Analysis; 17 - Project Costs and Benefits; and so on.
2. A Planning for Implementation Workshop - conducted over three or more weeks for project teams with responsibility for preparing

action or implementation plans for projects having been approved or authorized. This workshop is conducted using Manual I -- Planning for Implementation, with an assortment of modules, including:

3 - Work Breakdown Structure; 4 - Activity Description Sheets; 6 - Linear Responsibility Charts; 9 - Project Scheduling--Network Analysis; 10 - Milestones Description Charts; 11 - Planning and Budgeting; 35 - Introduction to Contracts; 38 - Project Files; and so on.

3. Project Seminars - introducing specific concepts, project-relevant skills and project systems as illustrated in Modules 12 -- Role of PAMCO; 31 - Decision-making System for Projects; 44 - Introduction to Lending Agencies; 36 - Project Documents for Planning and Implementation; and so on.

The Project Planning and Management Series is designed to complement the lectures, exercises, project work and consultations of PDRT workshops. IT IS NOT INTENDED TO BE USED AS SELF-INSTRUCTIONAL MATERIAL. It is designed for use in conjunction with the guidance of an experienced multi-disciplinary training and consultation team. An important characteristic of action-training, typical of adult education, is that it draws upon the knowledge and experience of the participants as well as the PDRT as an integral component of the workshop. The material in the series is, therefore, basic, operational and brief. It is expanded and reinforced during project work and workshop interaction.

The ultimate justification of this series is similar to that of the action-training introduced through the National Planning Project. If it contributes to promoting better project formulation, successful implementation and generally helps to move projects forward, it is justified. However, the importance of the series goes beyond this if it ensures that Jamaica increases her indigeneous capability and capacity for formulating and managing development projects as part of the thrust toward increased self-reliance and independence.

The present series is part of a process of materials development and action-training which has been initiated by the National Planning Project. There are gaps and inadequacies which will be identified. The series is not intended to be static. It should be expanded, revised, adapted and tested through an evolution of action-training and application to projects so that its relevance is maintained through constant upgrading and revision. The series is only the beginning of a process of developing practical approaches, tools and techniques to ensure effective management of our resources in the challenges of development facing us in the immediate and distant future.

I. INTRODUCTION

1.1 Purpose of this Manual

The purpose of this manual is to help planners and administrators of projects understand the basic approaches to pre-investment project planning to ensure comprehensive, integrated, and realistic plans. Sound project planning is the foundation upon which projects are successfully implemented. Project plans must be written in such a way that the objectives can be reasonably attained within the actual setting of the project. This requires that projects go through several planning and decision points before they are authorized for implementation. Project planning should be carried out with a thoroughness which reflects a commitment to systematic analysis and decision-making. When unworthy or unsound projects are pushed into implementation, the resulting waste of resources, energy and goodwill prohibits and undermines achievements toward the overall development objectives to which the projects were designed to contribute. Project planning takes time and is a very important exercise, even though there may be pressure to get projects started. Pushing "Immature" projects, which have not been thoroughly planned, into early execution, makes the exercise of implementation even more risky and difficult than it is normally -- and increases the possibilities of project failures or under-achievement.

The job of project management is to plan, organize, direct, control and co-ordinate a unique temporary organization known as a project. Because of the characteristics of a project, (e.g., constrained by an absolute time frame for planning and implementation, with a specific task orientation, an unconventional organizational structure, absolute budget constraints, high levels of risk and uncertainty, decentralized authority, and so on), it is imperative that the management of a project be more thorough in all aspects than traditional management. The general management functions must be performed as in conventional operational management. But on projects, the difference lies in the manner and thoroughness that is required in their performance. More skill, effort, and management ability is required in project management.

A project is a one-time effort. It must be done right the first time because there are no second chances in project management. Project managers have great responsibilities without the requisite authority. They must perform within a framework that has many more constraints, just because they are project managers. The material developed in this manual explains how project planners can effectively

construct a plan to permit project analysis, comparison, and selection. Comprehensive plans must, at a minimum, integrate the nine components of the Project Skeleton. Realistic planning and appraisal facilitates successful project implementation and successful projects are necessary to achieve the nation's overall developmental goals.

1.2 Focus of this Manual

The focus of this manual is upon the planning stages which precedes project authorization and the components of complete project documentation. Project planning involves documentation on all aspects of a project to ensure adequate consideration of alternatives and comprehensive examination of the selected alternative. Complete documentation is also important because of the nature of development projects which are unique and innovative. Special attention is required in planning in order to anticipate problems, constraints, obstacles, and opportunities. Planning is the first phase of the project cycle, and must attract funds and approval. But it must also be realistic.

The set of components which must be examined and planned are similar for all types of projects. Fundamentally, project planners must define the *problems* to be resolved, establish the *objectives*, know the *demand* for the output, design a reliable *technology* within the *resource constraints*, organize the project, *schedule* project activities, determine the project *costs* and *benefits* and measure project worthiness. Although projects differ in countless ways, these components are common to all projects.

This manual does not give guidelines on the technical aspects of project design. This would be difficult, if not impossible, because of the wide variety of development projects found in developing countries.

This manual covers the basic project components that must be covered in any project plan so that the plans are sufficiently comprehensive to permit analysis and selection. There are general similarities in the project documents required of all development-oriented institutions. Although specific formats may differ, there are common components. These basic components are reviewed in this manual. Further discussion of specific elements of the various project components are developed further in the associated training modules which complement this manual to form the Project Planning and Management Series.

When planning a project, it is of course, necessary to get the specific documentation requirements of the potential funding agencies. Besides the basic project components, there are generally specialized areas of interest, depending upon the policies, regulations and emphasis of the institutions. For example, some formats require statements about impacts upon women, rural poor, or urban migration. Others may require a statement of complementary or supporting projects and programmes. Whatever these specialized requirements, it is still necessary that the project plan, at all stages of development reflect the basic project components which are presented in the "*Project Skeleton*" introduced in this manual. The Project Skeleton (along with the relevant tools and techniques), is applicable to real projects and must be reflected in all project plans, if planners are to develop complete and integrated plans which can become a realistic foundation for successful project execution.

II. UNDERSTANDING DEVELOPMENT PROJECTS

2.1 Definition of Development Projects

"A project is a combination of human and non-human resources pulled together in a temporary organization to achieve specified purposes."¹ It is a distinct unit of activity which is chosen to be separately planned, analyzed, appraised and administratively implemented. As such, projects generally have unique management schemes. They are also limited or carefully defined within specific terms of scope, time, inputs and space.

Projects are best distinguished from programmes in terms of time and objectives. Programmes tend to be open-ended in nature, while projects have specific objectives and specific end points. There is, however, a great deal of ambiguity in the uses of these administrative terms.

Development projects may be defined as investments to create new or additional capabilities or capacities in a society for the production of goods and services. Within specified time and with specified inputs, projects are to produce a particular set of outputs to meet identifiable development needs. For example, the project outputs may be intended to satisfy the demands for particular products or services, to exploit for productive purposes, locally available natural and human resources, to produce goods and services for export, or to create social and capital infrastructures that allow productive activities to be performed more effectively or efficiently.²

By their very nature, development projects are risky ventures.³ They involve a great deal of uncertainty. They are unique. They are investments of scarce financial, human and physical resources. They have controversial or change-oriented objectives. They involve processes which have not been tested in the particular way or setting before. Thus, there is a need for a special approach to the development of these projects, an approach which promotes problem-solving, resource mobilization and co-ordination, organizational collaboration and integration, and effective monitoring to ensure that planning

accurately supports the anticipated implementation experiences of the project. Effective planning can reduce many of the risks and uncertainties of development projects, but not all. It can create capacities and systems for creative and effective response to project problems, so that the overall directions and objectives of the project are maintained.

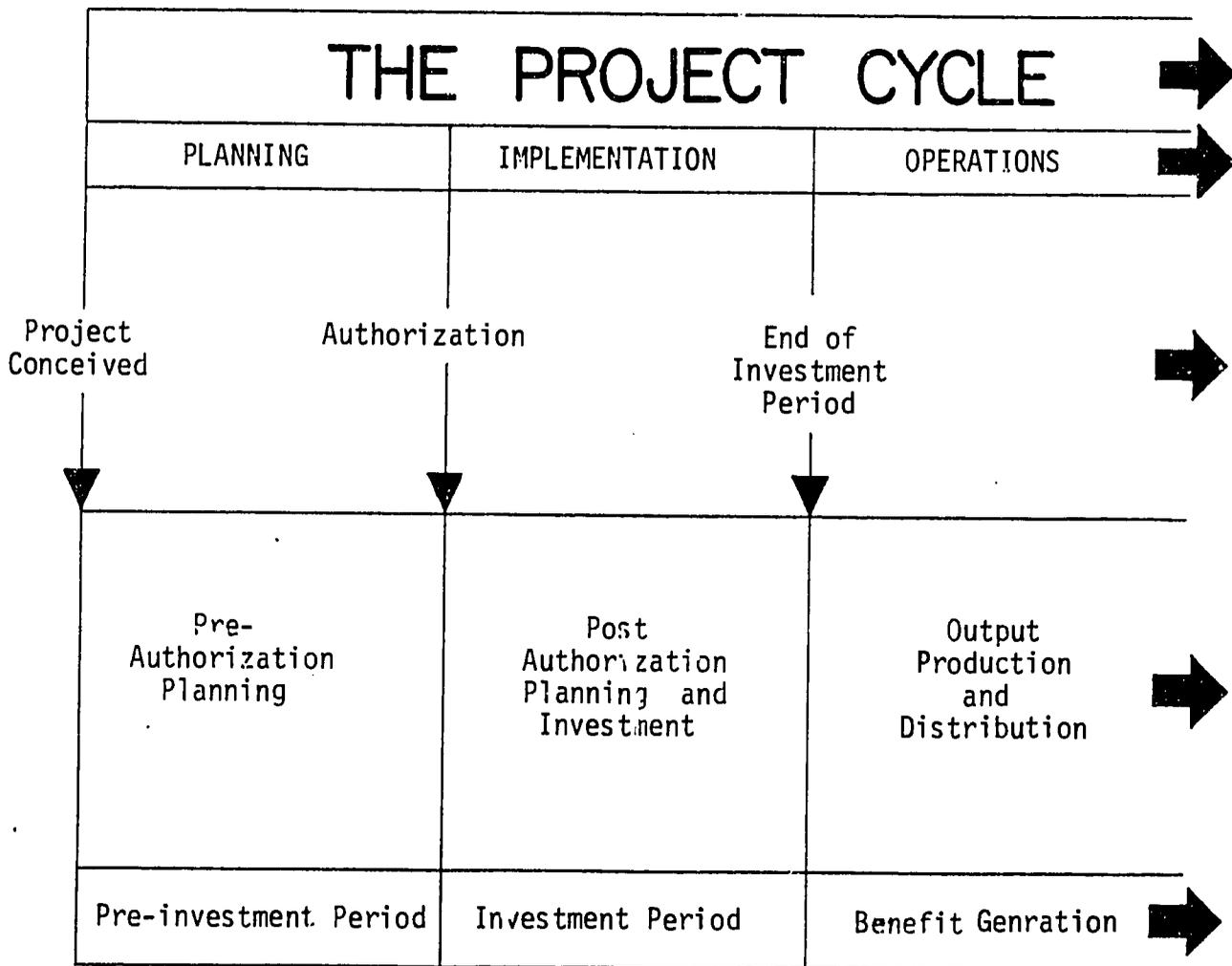
Finally, planning is only the first phase of a development project. The uncertainties inherent in projects require constant re-planning as part of the control and direction functions of project implementation. Therefore, project plans are indicative rather than blue-prints. That means that a project plan shows what is to be done, and how and when it is to be done, but the plans must be constantly re-formulated in light of the experiences and challenges of development projects.

2.2 *Project Life Cycle*

Projects mature through distinct phases. The '*Life of a Project*' refers to that period of time extending from a project's identification as a crude idea through its conversion into a routine operation or its final termination. Three basic phases can be identified: (1) Planning, (2) Implementation and (3) Operations, as seen in Figure 1.

Planning deals with all the pre-investment activities which attempt to identify the project idea and to formulate the project idea into a set of technical and organizational plans that can effectively achieve the intended objectives within the specified time period. *Implementation* deals with the "investment period" of the project when the physical and human structures are put in place for the productive processes of the project which are to follow. *Operation* deals with the period of actual output, generation and distribution where the benefits of the project are realized and used.

FIGURE 1: MAJOR PERIODS OF PROJECT LIFE.⁴



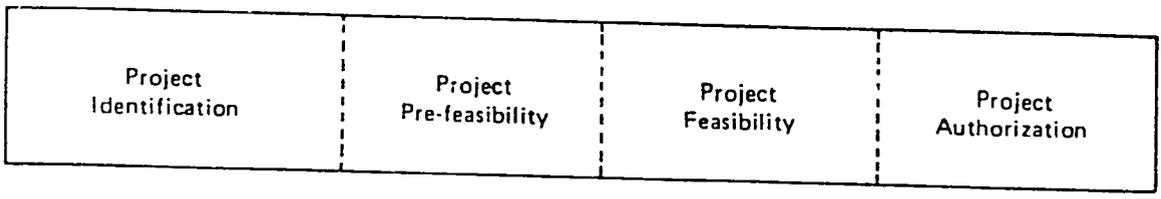
The phases of planning, implementation and operations must be accompanied by financing. Before there is a heavy commitment of resources to project implementation, the project idea should be well conceptualized, documented in appropriate formats and carefully analyzed. The several stages of planning are marked by points of decision where projects can be promoted for further development or rejected.

In Figure 2, we see the major project phases -- *Planning, Financing, Implementation and Termination*. Each is composed of distinct stages which are essentially sequential in nature, e.g., Feasibility Studies. The phases of the project life are sequential, but overlap to some extent. For example, the Project Planning Phase is followed by Project Implementation, but there may be some overlap, as planning for implementation may begin during the final stages of authorization. Project Financing is a functional phase which overlaps with all phases of the project life cycle.

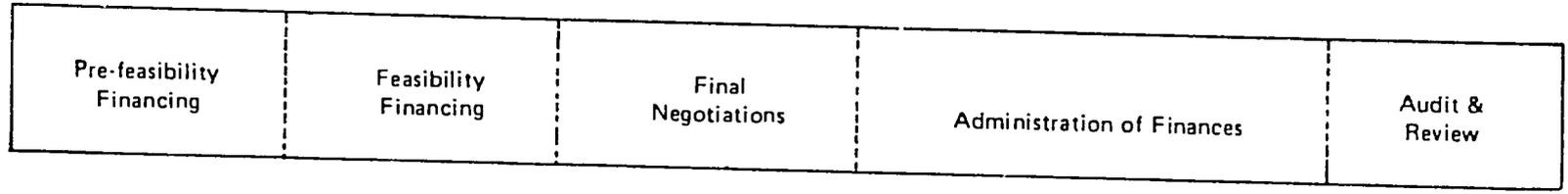
The project phases are distinct, in that they entail unique sets of actions which lead to the development of a mature project. The phases as well as their internal stages are divided by distinct decision points or "transfer" points, which mark the movement of the project to subsequent levels of maturity. For example, a project is expected to have passed through the distinct stages of identification and selection, formulation and appraisal, approval and authorization before resources are committed for the implementation of the project.

The task of project administration is to co-ordinate and document the maturing of projects through this normal life cycle. Within each of the phases, the component stages consist of a number of activities, analyses and decisions which are conducted with varying degrees of depth and precision as the project matures. The thoroughness with which the project phases and component stages are co-ordinated and integrated, influences the successfulness of projects at the various points of development as well as their final outcomes. At each stage and phase, there needs to be attention to the completeness and accuracy of the work done at earlier points.

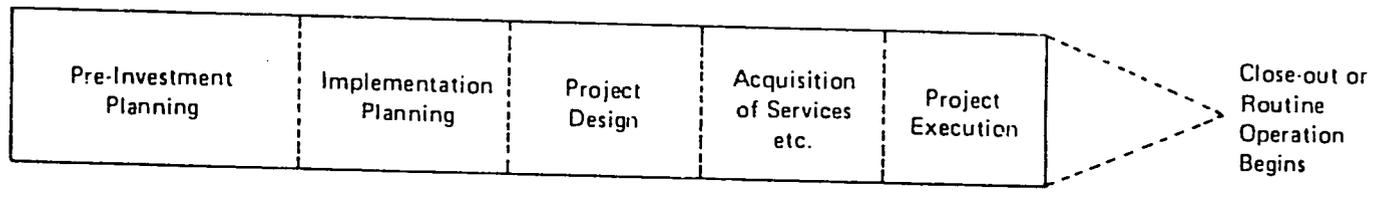
PROJECT PLANNING PHASE



PROJECT FINANCING PHASE



PROJECT IMPLEMENTATION PHASE



PROJECT DIVESTMENT PHASE

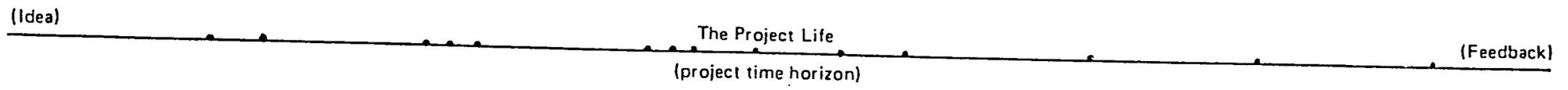
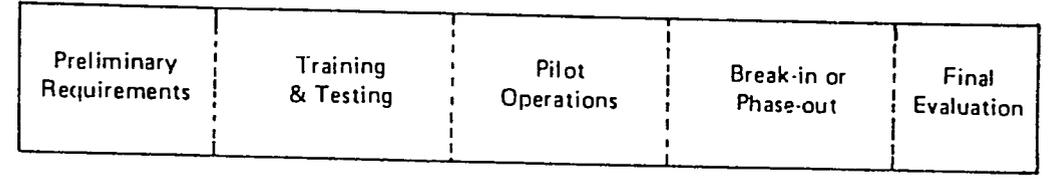


Figure 2: PHASES AND STAGES IN THE LIFE OF DEVELOPMENT PROJECTS

To be effectively responsible for the planning stages, project planners need to understand the total life cycle of a project. In the Jamaican Project Planning System, a project idea must be documented in a Project Profile.* Early selection must be made by the Pre-Selection Committee. Planners must recognize the purpose and functions of these activities in the project identification stage. These points in the planning phase, facilitate project formulation and development in the later planning stages and influence strongly the Implementation Phase. Projects must move properly through the project cycle to maturity. If any of the stages are unduly skipped in haste to "get something on the ground", this results in frequent delays and discouraging mistakes in implementation which could have been avoided. The Project Planning System for government projects requiring foreign loan is shown in Figure 3.

Because projects have *high visibility*, there is a tendency to force them into construction or early implementation often before pre-investment documentation is complete. The unfortunate result of such haste may be inappropriate physical and organizational structures which result in excessive project costs, time overruns, high levels of conflict or disagreement, and disappointing project results. Project implementation and the commitment of project resources should be restrained until planning and authorization are completely and properly conducted.

Projects are also accompanied by *high expectations*. By analogy, they may be seen as the "examination results" of government. Project announcements are often highly publicized. As expectations for performance and benefits are aroused, projects will be closely observed by all interested persons and groups. Project planners and managers must adopt systematic procedures of planning and management which will help ensure the highest probability of project success. This is especially important in light of the general conditions of uncertainty and risk which envelope most development projects. Project planners and managers must be able to correctly analyze the stage of development of a project and work with it from that level so that it is moved realistically and successfully into implementation.

Most projects have fairly distinct termination points at which they are completed, lead into subsequent projects or programmes, or included under normal programmes of operations or maintenance.

* See Module 18, Project Profile Preparation

Although a single project ends, the experience of planning and project development is cyclical. The concept of *Project Cycle* refers to a "closing" of one project life through formal evaluative feedback mechanisms to influence the planning of other projects. In this way, experiences of one project are transferred to future plans for projects and programmes to close the cycle. The closing of the project cycle represents an informed and sophisticated planning process which forms the basis for successful project development in the future.

2.3 *Project Planning*

The Project Planning Phase, the first phase of project development, is the foundation for successful projects. It can be broken into three general stages:

- (1) Project Identification Stage;
- (2) Feasibility Study Stage;
(and which may include a pre-feasibility study); and
- (3) Project Authorization

The earliest stage of planning (Project Identification) should be completed as quickly and economically as possible. This will serve to minimize commitments to a project until a decision has been taken regarding its desirability and priority for further planning. Planning in each stage should be restricted to the guidelines of accuracy and precision for each stage -- e.g., relatively tolerant ranges for Project Profiles, but becoming more strict for Feasibility Studies. Detail and precision become more important as projects proceed through the planning phase, but should be refined as planning progresses through the planning stage, based upon the information requirements of each stage.⁵

Less worthy project ideas should be screened out before they are advanced to the later stages of planning and before there are significant expenditures on project development. The early stages of planning, facilitate generation of many project ideas which can be arranged into a project inventory. The inventory of selected projects can be used for the promotion of priority ideas into the feasibility study stage. This two-stage process of project planning, facilitates speedy and sound project development. For example, movement of a project through the Identification Stage should not exceed two months, depending on the size and nature of the project -- its scope,

complexity and uniqueness as well as the number of agencies involved. If projects are relatively small or simple, extensive analysis and review may not be necessary and recommendations can be made during initial appraisal to facilitate the rapid movement of such projects. Significantly, there is a tendency to spend time or money only on those project ideas selected for priority and desirability. Feasibility studies can then determine their worthiness and viability.

2.4 *Project Financing*

Project financing plays a critical role throughout project development. It cannot be isolated from any of the planning, implementation or termination activities. Co-ordination of financing with other project phases begins officially, when a project passes successfully through the Identification Stage. In many instances, however, the financing institutions are instrumental in initially identifying needs and conceiving project ideas. Finances for Pre-investment Studies are a very important part of government expenditures. They are the beginning of a full commitment of a project and should not be undertaken lightly. Project studies should not have any financing until a Project Profile has been submitted to the Pre-Selection Committee and approved for study.

For some projects, the need for financial support begins with the execution of a Pre-feasibility Study; for other projects financing will not be needed until the Feasibility Study; and for still other projects, financing may not be necessary until the Implementation Phase begins. The availability of funding should not be the determining factor for passing a project to a subsequent stage, but at the same time, it plays a very important role in project analysis and development.

There should be no financial outlay in project identification, because the Project Profile is designed to permit minimal expenditure on its development. The first stage in the Financing Phase is financing of a Pre-feasibility or Feasibility Study. This corresponds to the second "planning" stage and should be the first activity to require funding. Pre-investment Studies often get funding in terms of a local revolving fund for project development or development support funds from external agencies. Distinct project funding is usually sought for a Feasibility Study. The next stage encompasses the Loan Negotiations or the final agreements of the financing arrangements for project implementation. The fourth stage of the financing phase is the actual mobilization and administration of funds throughout the remaining life of the project. A particularly important

aspect of this stage, is the special attention to see that expenditures are proper and appropriately documented to permit claims and reimbursement. The final stage is the audit and performance review.

The Financing Phase consists of several distinct streams from various services which must be carefully co-ordinated. Financing may come from the government, or it may come from non-governmental sources such as international agencies or banks. Often there is a mixture of government and non-government funds. Because of the role of project or capital development funds in relation to the National Budget, it is important to be able to project the demands for project financing in terms of the Capital Development Fund and in terms of the recurrent budget. Non-governmental financing, such as loan or foreign assistance may be dependent upon proportional local participation and results in the assumption of significant recurring or capital expenditures on projects.

Governmental financing usually follows these general steps:

- (a) inclusion in budget estimates;
- (b) review by Ministry of Finance, in relation to the Budget and Investment Programme;
- (c) Parliament authorization;
- (d) release of funds;
- (e) expenditure; and
- (f) auditing.

Extra-governmental Financing must be co-ordinated by the Ministry of Finance and the Operating Ministry. Initial contacts, e.g., to obtain necessary funding for Pre-feasibility Study or Feasibility Study, can only be made after formal approval of the project at the appropriate planning stage. Testing a project idea with potential investors and securing information of requisite documentation can proceed concurrently with the preparation of the project. Final financing agreements must await authorization, and be appropriately co-ordinated with the planning phase. Once co-operation of a financing institution has been secured, representatives may be involved in planning, appraising and executing the

project. General steps which may be involved in Extra-governmental Financing include:

- (a) request for funding and project documentation;
- (b) agency review;
- (c) negotiations;
- (d) government approval;
- (e) agency approval;
- (f) administration of funds; and
- (g) audit and performance review.⁶

Project financing, especially during implementation requires co-ordination of several avenues of financing. Working agreements for relating finances and financing institutions, should be included in the Feasibility Study. A clear plan delineating tasks, responsibilities and relationships of all relevant representatives should be in force.

Orderly sequencing and interlocking of financing activities with planning and implementation is critical to successful project development. Financing is not an end in itself, but must be integrated and co-ordinated with other phases of a project.

2.5 Project Implementation

Even the soundest of projects, in economic and social terms, are worthless unless they can be implemented. Effective implementation must be done within determined technological, time and cost constraints. The Implementation Phase of a project can be initiated during later stages of planning. Special stages within the Implementation Phase may vary widely depending on the nature, scope, size, horizon, complexity and uniqueness of a project. However, a few general stages illustrate the types of activity sets which are incorporated in the Implementation Phase. They demonstrate the dynamic relationships of activities in this phase to those in other phases.

Several stages are illustrated in Figure 2. During the Implementation Planning Stage, the implementing organization is

identified and representatives are selected to participate in the planning of the project.* At this time it is beneficial to establish a Project Charter which identifies the responsibilities of project management and the relationships and roles of all participating agencies. The Charter forms a foundation for the second stage, the appointment of a project management team. The first responsibility of the team is to formulate a detailed project plan for implementation. Subsequent stages of the Implementation Phase include Project Design, Tendering and Training, Procurement and Resource Mobilization, Construction and Delivery of Service/Output, and Operation of the Output System.⁷

This phase is the most visible of the project; and, it is the final step in the rest of project worthiness -- that is, the ability of the project to produce the intended benefits. During implementation, project management must have the innovativeness and flexibility to adjust implementation plans in response to problems which arise. If major changes are introduced, the approval of all relevant supporting agencies must be secured. In general, successful implementation is the direct responsibility of the assigned project management.

2.6 *The Project Termination Phase*

The final phase of a project is the Termination Phase.** This phase prepares the project to either phase out or to become a routine programme or operation. Many projects become part of larger programmes. The preparation for this transformation begins during the planning stages and is integrated into various implementation stages.

* See Manual I for a systematic approach of Planning for Project Implementation from the selection of a nucleus project team to the establishment of a control system.

** See Module 43 - Project Termination

The Divestment Phase, at a minimum, may include the following general stages:

- (1) Planning for Routine Operation;
- (2) Training, Recruitment and/or Construction for On-going Operation;
- (3) Break-in and Testing Period; and
- (4) Final Evaluation of the Project.

Early identification of all required organizational and management changes, manpower additions, education and training, materials procurement, facility expansion, etc., made necessary by the transition to Routine Operation is important. Time to actually test the output and delivery system, e.g., a Break-in Period, must be co-ordinated with the Implementation Phase of the project. At the close of the Termination Phase, the project is divested and functionally-oriented management systems come into effect to manage the operation of the output system throughout the continuing productive life of the system.

Elements of appraisal, audit and evaluation are incorporated into planning and implementation throughout a project, but a project must end with a full evaluation of all performances throughout the project life. The feedback from this comprehensive evaluation will be important to future project efforts so that technological, cost, time and expertise obstacles and hurdles can be circumvented, overcome, or, at least, anticipated. Project histories and evaluations should be compiled in a centrally accessible library. In such a feedback system, projects do not end in themselves, but are part of a larger learning experience to improve performance and productivity in future social action projects and programmes.

III. PROJECT PLANNING SYSTEMS

3.1 Purpose of a Project Planning System

Project Planning refers to the process of developing a project from its conceptualization as a crude idea into a fully formulated project. A Project Planning System refers to all aspects of that process. So as to manage the planning of projects effectively, it is important to identify the groups involved at various stages and their roles relative to each other and the project. A planning system that is to produce competently designed and analyzed project plans, must encourage the passing of the ideas through stages of decisions and formulation. At each stage, the idea should become more detailed and accurate, and the analysis should become more intense and precise. The purpose of a project planning system is to ensure the following:

- a) projects serve the priority needs of the society;
- b) projects consistently support sectoral and regional development policies and strategies;
- c) projects carefully screened and developed to promote best project alternatives; and
- d) projects have reasonable chances of success, technically, economically and socially.

3.2 Components of a Project Planning System

Decisions are made at critical points to pass a project into more advanced stages of planning or development and must be the result of careful analysis and appraisal. Project appraisal is a critical component of a planning system. Projects must not only be formulated, but also appraised to verify the technical, commercial, management, financial, economic and social data of the project. Appraisal entails the systematic application of designated tests of consistency, efficiency and worthiness to a project and an evaluation of its role in meeting social and economic goals. Decision-makers should assist in the design of appraisal criteria and should encourage its systematic application by using the results in decision making.

Sound project analysis ensures that projects are based upon valid assumptions and that they are technically consistent and sound.

For example, sound projects are ensured by verifying that:⁸

- a) objectives and targets are clearly identified and consistent;
- b) costs and benefits are properly identified and calculated;
- c) financing and management is feasible;
- d) the project is technically viable; and
- e) the project is consistent with its larger context and environment, such as institutional or national capacities, ecological system, etc.

The Project Planning System is characterized by the following major points of decisions:

- a) decisions on the desirability of the idea for formulation;
- b) decisions on the technical and financial/economic feasibility of the project; and
- c) authorization for implementation.

Each of these primary decision points closes a stage in the planning of a project as illustrated in Figure 3. At each decision point, a project may be:

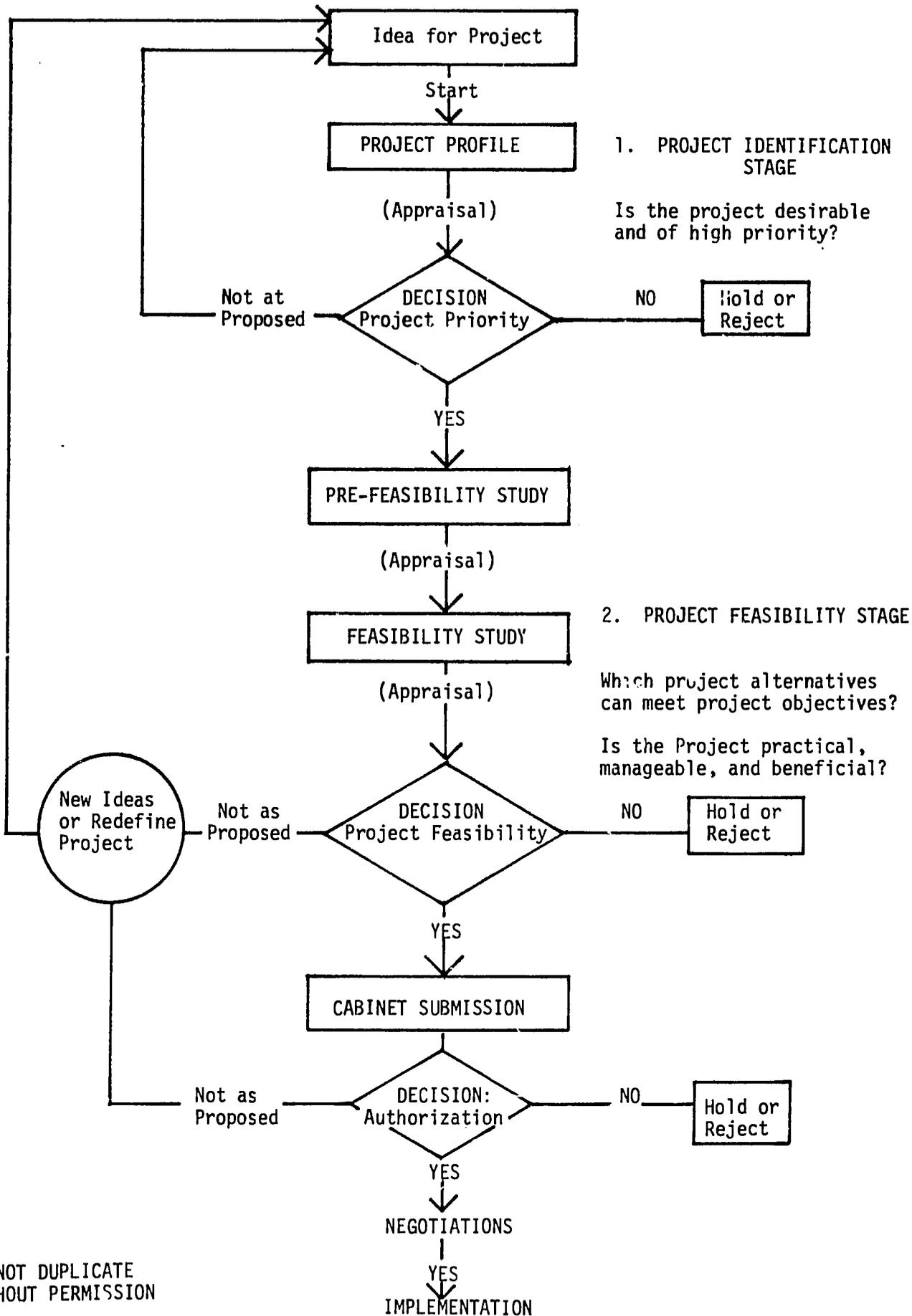
- i) approved and promoted to subsequent development;
- ii) rejected;
- iii) held for later consideration; or
- iv) returned for revision or reformulation.

Each of the decision points serves a specific function.

The first decision point is the close of Project Identification Stage. It is based upon the Project Profile. The focus of the decision at this point is upon the desirability of the project, its

F. An Overview of the Project
Planning System.

FIGURE 3



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priority relative to other project proposals, and whether there is justification for further study and development of the project idea. During project identification, there should be minimal investment in documenting the project idea, whether in terms of person hours or costs. The information in the Project Profile is expected to be rather general in nature, deliberately, to limit the time or investment in substantiating many of the assumptions which must be made when using readily available data. At this stage, the clarity of objectives and outputs are more important than precision of technical or cost data. If the objectives are within the priority or ranking criteria of the Pre-Selection Committee, the subsequent feasibility studies will focus upon the accuracy of those components of the project plan. Depending on how projects are identified, there may be pre-identification expenditures such as sector studies. These however, often relate to programmes, and not specific projects, and the costs are not considered part of this "project identification" stage.

The second major decision point is at the close of the Feasibility Study Stage. Within this stage, there may be two different types of studies -- Pre-feasibility Studies and Feasibility Studies -- depending upon the nature of the project. A Pre-feasibility Study is designed to select appropriate alternatives for the project. It includes a consideration and ranking of project variants in terms of technology, location, organization, phasing, etc. From a Pre-feasibility Study, one of the alternative project variants is selected and submitted for decision and subsequent Feasibility Study. The Feasibility Study is to determine the technical, financial, and or organizational worthiness and viability of the project. This is the most precise stage of planning. It is usually necessary to verify specific data which goes into the formulation of a Feasibility Study. Technical information is needed at this point, with precise data relative to the specific project. Demand information, technology information, costing and revenue information, organizational information, etc., must be as precise and as complete as possible to permit a final appraisal of the project before submission for authorization.

The third decision point is the official Approval and Authorization of the project for implementation. This follows upon the submission of project documentation to the Cabinet. The decision, if affirmative, promotes the project from the Planning Phase into the Implementation Phase formally and sets the project in readiness for the initiation of resource mobilization to carry out the project.

This process, as previously outlined, is carried out for projects at the national level, but planning processes within ministries and agencies should parallel this planning process. Within each Ministry or Agency, there should be a distinct process of moving project ideas from the level of conceptualization through the various pre-investment stages to authorization. The process of each Ministry or Agency should be linked to the national processes for project selection, budgeting, and capital financing.

3.3 *Destiny of a Project in the System*

Throughout the project life, critical decision points are identified, especially in the Planning Phase where the decisions about the destiny of a project occur at the close of each planning stage. (See Figure 2) At these points, all requisite documentation, including appraisals and recommendations, will have been developed and collected as a basis for an informed decision. At decision points, projects are functionally screened. The screening process is based upon the comprehensive testing of the worthiness and the desirability of a project within the designated requirements of that planning stage.

The final step of decision-making within each stage may follow one of several options, e.g., a project may be approved or rejected; it may be deferred; it may be referred for revision; or it may be approved, but with clear qualifications.

Approval: Approval means that a document has been accepted and that the project is advanced to subsequent planning stages. It implies that project documentation has convincingly established the soundness and desirability of the project.

Rejection: When it is conclusively revealed that a project is undesirable, unfeasible or of very low priority, it should be discarded from further consideration. Insurmountable obstacles should be identified as early as possible to restrict the use of scarce resources in the development of unsound projects.

Deferral: If a project is found to be feasible, but it seems advisable to postpone further project development for a certain period of time, then a project is deferred. Deferral may result for a variety of reasons. A project may be more appropriate for some time in the future; support for a project may be more available after some time; a project may depend upon other decisions and actions outside the

influence of the planning systems; or a project may be of low priority so it is placed on a waiting list of projects. Whatever the reason, projects should not be undertaken until the time is judged to be optimal. Deferral may occur at any stage, even following Project Authorization. A catalogue of deferred projects and their level of maturity within the project development system should be kept.

Referral: Some projects may come to the decision point with inconclusive evidence to support a decision. In such instances, projects may be referred to relevant agencies for revision and further study prior to their reconsideration. Appraisal may have been less comprehensive than desired. Projects variants may have been prematurely dropped from analysis; or, one dimension of a plan may cause doubt although all other dimensions appear sound. If there are questions about the data, the thoroughness of the analysis or appraisal, or the basis for recommendations or conclusions, a project should be referred.

Qualified Approval: Approval may be granted to a project, but only upon the qualification that specific recommendations and guidelines attached to future project development are maintained. Such qualification may relate to a wide range of issues:

- (1) specific and relevant information may be requested in future project development;
- (2) specific guidelines for developing the project may be attached so that speed of project development is facilitated or so that particular processes are followed which may deviate from or be amended to the regular process;
- (3) certain financial, management or technological constraints may be prescribed for future project development; or
- (4) project approval may be contingent upon parallel investments or developments in related sectors, programmes or projects to ensure the viability of the project.

Appeal: Project screening is explicitly designed to reject less worthy projects through the systematic application of programming and appraisal criteria. Upon rejection, a project may be re-designed and then re-submitted for consideration, or an appeal process may be initiated which calls for a review of the decision-making process as

well as the decision. Channels of appeal are identified in the planning system. They are normally at the highest stage just above the decision point where a project may have been rejected, e.g., at the end of the Identification Stage, when the appeal would be carried to the Cabinet. When an appeal is considered, it should be based upon priority and sound technical arguments.

3.4 *Types of Planning Studies*

There are three basic types of studies which are done during the Planning Phase of projects:

- 1) Project Profile or Identification Study;
- 2) Project Pre-feasibility Study; and
- 3) Project Feasibility Study.

Each of these three studies serve distinctly different purposes and build upon each other from identification through feasibility to permit increasingly precise planning analysis of the project. Through the succession of these studies, a project idea takes a distinct form. It becomes a distinct proposal in terms of sets of actions and costs so that various analyses and appraisals can be conducted to determine the desirability, the viability and the worthiness of the project. The planner must be aware of the purposes and the documentation requirements for each of these types of studies.

3.5 *The Project Profile**

The Project Profile is a document which concisely describes a proposed project idea. The Project Profile presents the project idea in a standardized format to facilitate the early appraisal of project ideas. This standard format requires particular preliminary data and information necessary for project appraisal and pre-selection. It is the first step in introducing a project idea for the consideration and action of the government.

* See Module 18 - Project Profile Preparation

The Project Profile is prepared by any initiating Agency, Department or Ministry and is based upon readily available information and data as appropriate at this initial stage of the project development. The Project Profile assures that project ideas are clearly identified and that all important information is available to decision-makers. The various sections of the Project Profile answer the following questions: What is the project? Why should it be done? How can it be accomplished? When will it be done? How much will it cost? How will it be financed:

The primary purposes of the Project Profile are to:

- a) establish preliminary documentation on a project idea to assist decisions on the future of the project;
- b) identify the basic needs and objectives which the project would be developed to address;
- c) identify the specific outcomes (benefits) and outputs (products and/or services) of the project as designed to satisfy the identified needs;
- d) outline in a preliminary design, the major components of the project and critical assumptions and conditions upon which project development is dependent;
- e) provide preliminary financial information so that projects can be appraised, pre-selected and incorporated into the capital budget.

Data for the Project Profile can be obtained from readily available sources. The sources might consist of such documents as Ministerial Papers, sectoral studies, market studies, data and history from similar projects, etc. New data need not be developed for the preparation of this document. Where data is not available, assumptions must be made, *and so identified*, during the preparation of the Project Profile.

Because of the nature of the data, estimates and assumptions required for the Project Profile, no specific level of accuracy regarding costs and quantities will be expected. However, the Project Profile should be as accurate and detailed as possible. The statement

of project objectives, goals and needs should be particularly precise, as the first analysis emphasizes the priority of the project. This information will form the basis for appraisals of the project idea, with respect to its contribution and role in relation to national and sectoral priorities.

3.6 *Pre-feasibility Study**

A Pre-feasibility Study is sometimes required *after* the Project Profile has been approved and pre-investment financing has been authorized.

In a Pre-feasibility Study, alternative ways in which the project may be carried out are explored. For any given set of goals or demands, there are generally a number of ways in which desired objectives may be achieved. In planning, it is necessary to investigate alternatives in order to arrive at project solutions which are optimal. The deferral of judgement on viable alternatives until they have been formulated and studied, and the maintenance of a spirit of openness to variations, are key elements in sound and creative planning.

In a Pre-Feasibility Study, a number of alternative schemes (project variants) should be examined in a relatively economical and rapid manner to gain a reasonably fair idea of the soundness of the competing alternatives. Alternatives which are found to be highly unsound are immediately screened from further consideration. Alternatives to be directly examined are thus reduced to those deserving of detailed analysis. From the Pre-feasibility Study, it is assumed that the best alternative(s) will emerge for appraisal and decision before a project enters the Feasibility Study.

The primary purposes of the Pre-feasibility Study are as follows:

- (1) to analyze the range of alternative solutions to narrow consideration down to the most favourable optimal solution(s);

* See Module 39 - Formats for Pre-Feasibility and Feasibility Studies

- (2) to ascertain whether the project warrants further study and consideration, such a full-scale study of feasibility; and
- (3) to determine the directions and guidelines for further development of the project, if approved, by establishing an appropriate plan for advanced study.

Analysis and preparation of the Pre-feasibility Study should be primarily based on existing data which can be readily assembled. All possible information sources should be explored such as records of similar or related projects, pertinent literature, ministerial records and data, empirical studies of sectors and regions, national plans, etc. In general, new surveys and tests are not encouraged if data of the appropriate quality can be drawn from existing sources. The study is expected to achieve a 20-30 percent degree of precision. But timeliness of the study is more critical than precision, as accuracy will be demanded later. But care should be taken to avoid the introduction of biases into the study because of this flexibility.

3.7 *Feasibility Study**

Project Feasibility Study begins after approval of the selection of preferred project alternative(s) and the authorization of funds for advanced planning. In this study, a project must be systematically and intensely examined. The purpose of the Feasibility Study is to present a precise and accurate picture of what is entailed in the actual undertaking of the project. Upon this study and subsequent analysis, appropriate governmental and financing authorities will make their final decisions to approve, amend or reject the project.

This stage of planning is the most exhaustive. However, efforts which have already gone into the preparation of previous documentation begin to pay off in terms of a more relevant focus in the Feasibility Study and in a more speedy completion of this study. The former planning provides a more solid foundation for projects which reach

* See Module 39 - Formats for Pre-Feasibility and Feasibility Studies

this planning stage. The effective and efficient use of manpower and funding throughout planning is facilitated by performing full-fledged studies of feasibilities only upon carefully selected projects.

The operating Ministry is primarily responsible for preparation of the FEASIBILITY STUDY. A work plan for the study should be part of previous documentation. The Ministry may use its own personnel and/or personnel drawn from external sources. In co-ordinating the team in accordance with the work plan for Feasibility Study, the Ministry is responsible for identification of team members, for the planning of methods and procedures to be followed in the study, for the outline of relevant fields of investigation and the analytical procedures to be followed, and for the administration of the budget and for assignment of responsibilities to be carried out in doing the Feasibility Study of the project

The primary purposes of the Feasibility Study are as follows:

- (a) to verify that the project solution reached at the Pre-Feasibility Stage is:
 - i) technologically appropriate and technically sound;
 - ii) satisfactory in terms of financial and economic returns accruing to the project and its beneficiaries;
 - iii) realistic in terms of project objectives and goals and that these are met in the best possible way; and
 - iv) supportive of national and sector priorities and goals;
- (b) to verify that the project will be successful within the environment (social, cultural, political, institutional, administrative and ecological) in which it will be executed;
- (c) to provide a detail guide to all actions, such as organizational, managerial and legal requisites, which are necessary project implementation and operation;
- (d) to provide data and analysis as required by potential financial agencies for appraisal of the project; and

- (e) to provide a complete project document for submission to the Cabinet to facilitate a decision to authorize the allocation of resources for the project.

The Feasibility Study should be precise. Calculations and analysis are expected to be accurate within ± 10 percent. If sufficient data are not available to test the soundness of the project, new surveys should be undertaken to develop the requisite data. The Feasibility Study is the central document in this planning stage and is the basis of the final decision on the project.

3.8 Project Planning Time

It is anticipated that the preparation of a Project Profile should not take more than two to three weeks, and that the flow of a project through the Identification Stage will not exceed one month. It is important to facilitate the early flow of the project ideas so that quick decisions will lead to project development and so that there will be early screening of less desirable and low priority projects.

The time for a Pre-Feasibility Study should take no more than two to three months as the documentation is based on generally existing data. This is rather flexible, depending on whether the project is unique or routine in nature. Again, it is important to facilitate a smooth and rapid flow of the project through this stage to the decision point. Some latitude in the degree of accuracy required in the preparation, permits more speedy development of project variants.

A sound planning system fosters sound project development, which, in turn, fosters sound projects. Although the planning system requires the development of three distinct sets of project documentation before it is prepared for Cabinet submission, the overall efficiency of project development will be improved by an earlier elimination of unsound and unworthy projects. The system decreases the expenditure of scarce manpower and finances in the development of projects while speeding up the total process by co-ordinating the interaction agencies involved in project development. Sound project planning and implementation are facilitated through the promotion of worthy and viable projects for planning and investment.

3.9 *Costs of Planning a Project*

Projects are simultaneously screened and developed as they pass through the Planning Stages. The systematic development of projects ensures that preparation and appraisal standards are upheld and that costs are held down. Expenditures on early planning are limited and unsound projects are eliminated early in the planning phase.

Guidelines have been established for the relative costs of project preparation at the initial planning stages -- Identification, Pre-feasibility, and Feasibility. The estimated costs of planning are proportional to the total size of the ultimate project, and the guidelines are flexible due to different planning needs, based upon the nature, scope, complexity and uniqueness of the proposed project. Many projects should fall below the development cost estimates because of the accumulated experiences with similar projects.

The cost of a Feasibility Study could, at a maximum reach up to 2% of ultimate project cost. In most cases, it should be considerably lower. The cost of a Pre-feasibility Study might be approximately 10% of the projected cost of a Feasibility Study, or 0.2% of ultimate project cost. Project Identification, regardless of the project, should not cost more than several hundred dollars.

These guidelines suggest that for an ultimate project estimated to cost \$1,000,000 (one million dollars), the cost of planning the project should not exceed the following:

Project Profile (Rough Planning)	\$	500
Pre-feasibility Study (Study of Alternatives)	\$	2,000
Feasibility Study (Detailed Plan)	\$	20,000
Engineering Design (an Implementation Stage)		75,000
Implementation		\$1,000,000

It is seen that the total costs for all Planning Stages is approximated to reach a maximum of \$22,500, slightly over 2% of the ultimate project cost estimate.⁹

3.10 *Comparison of the types of Project Studies*

The three types of project studies are parallel, in that, the same components must be studied. Although the components examined are similar, the purposes differ. The Project Profile is much less

precise, but emphasizes clarity of objectives; the Pre-feasibility Study focuses upon the selection of an alternative scheme; the Feasibility Study, the most precise and intensive of the studies, must be as accurate as possible to test the soundness of the project in all aspects.

The differences between the three types of project studies can be illustrated by examining the content of one component that is common to all studies. The Demand or Market component of the study is a good example. These differences are illustrated in Figure 4.*

* See Module 39 - Formats for Pre-Feasibility and Feasibility Studies

FIGURE 4 MARKET STUDY

INFORMATION REQUIRED BY: PROJECT PROFILE
PRE-FEASIBILITY AND FEASIBILITY STUDIES

A. Project Profile Paper

- (1) Raw material market situation
 - (a) Existing resources (names, location, quantities)
 - (b) Past and present utilization (estimated quantities only)
 - (c) Approximate balance of available raw materials, vs present utilization
- (2) Market situation of specific products
 - (a) Past demand for specific items (past sales in quantities and prices)
 - (b) Past supply of specific items (approximate totals of past local manufacturing and imports)
 - (c) Past coverage of demand and assumed future trends (approximate quantities, qualities, prices)

B. Pre-feasibility Study

- (1) Raw material market situation
 - (a) Pre-selected resources (names, location, quantities and qualities, and other key data)
 - (b) Approximate utilization of resources (main consumers, local and abroad, yearly consumption, individual supply situation, general raw material policy, laws/regulations)
 - (c) Presumptive balance of available raw materials vs. present utilization (possible supply sources covering present + future demand)
- (2) Market situation of specific products
 - (a) Approximate demand for specific items (past/future total sales/demand, in quantity, values, specific prices for all local/foreign customers)
 - (b) Approximate supply of specific item by suppliers:
 - (i) Present total local manufacturing capacity
 - (ii) General quality of products
 - (iii) Past imports and their expected future trend, volumes, and prices
 - (c) Approximate coverage of demand (past/future quantities, qualities, and prices)

C. Feasibility Study

- (1) Raw material market situation
 - (a) Chosen resources
 - Detailed data on topographical distribution of raw materials
 - Itemized material analysis
 - (b) Detailed utilization of resources
 - Supply situation
 - Kind of specific enterprises
 - Specific customers, their past and estimated purchases
 - Prices at places of production
 - (c) Detailed balance of available raw materials
 - Adequacy of supply: quantities, qualities
 - Prices
- (2) Market situation of specific products:
 - (a) Detailed demand for specific items
 - Past/future, local/foreign sales demand
 - Main consumers
 - Specific consumption per capita
 - Prices, fluctuation
 - Regional distribution
 - Quality requirements
 - Influence on market situation caused by laws and regulations
 - (b) Detailed supply of specific items by suppliers
 - Present manufacturing/importing companies
 - Manufacturing units, capacities, age, load factors
 - Product qualities
 - Location
 - Sales: past and expected future
 - Transport facilities
 - New units under construction/planning
 - Expected elimination (if any) of local plants and imports
 - Prices
 - (c) Detailed coverage of demand
 - Past/future quantities, qualities, prices
 - Regional distribution

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Material

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IV. INTRODUCTION TO PROJECT PLANNING

4.1 *The Background of Project Planning*

Most developing countries are faced with the immense challenge of organizing scarce resources and making decisions affecting development, so as to achieve the highest possible levels of benefit as effectively and efficiently as possible for the greatest number of people in the shortest possible time. This is a very difficult task, especially with the serious political, social, economic and administrative constraints facing the government. Less developed nations, by definition, have a lack of organizational talent, developed resources, infrastructure, leadership, and so on. When the government seeks to adopt an enlarged public sector investment portfolio as one of the main mechanisms for achieving a greater degree of control over the economy and as a foundation for accelerating development, development planning becomes a major task.

The development project is the major form for public sector development activities, and the vehicle for much international and bi-lateral assistance. Success of development planning relative to projects requires:

- (1) the formulation of a co-ordinated development plan;
- (2) the existence of a continuously updated inventory or projects;
- (3) a method of appraisal by which objective ranking and selection of potential investment ideas can proceed;
- (4) a system for ensuring speedy and efficient project implementation; and
- (5) the existence of a project planning and management capability to plan, organize, co-ordinate, monitor, control and carry out development activities to ensure the effective utilization of scarce resources.

A project is not merely an "investment idea" which can be approved for immediate implementation, nor is appraisal merely a formal stage of project development. Experience has shown that a project normally has a large number of complex activities, even

apparently, simple projects. Projects require a wide range of technical and management skills and they often involve more than one Ministry or Agency, so there must be careful co-ordination and organization. Pre-investment planning is a must, because projects are unique, one-time activities which have to be accomplished within limited resource and time constraints. Even when well-planned development projects tend to incur high costs which increase disproportionately their time and complexity.

The complexity of carrying out projects is often underestimated or misunderstood. In almost every project, unanticipated difficulties occur. The reasons for this are quite simple. Projects exist in the areas of economic and social development and are designed to bring about some significant changes. Change always alters existing relationships and patterns, so resistance can always be anticipated, even if only the natural resistance due to traditions and habits. Because complex changes are not well defined and because there is an element of experimentation in bringing about the changes, planning is a particularly important aspect of project development, ensuring that the project idea is well examined and formulated before there is a commitment of funds and resources to its implementation.

Planning and analysis are necessary to ensure that the government is able to compare projects and select the best, suited to meet its development needs. In anticipation of the difficulties of implementation, project formulation and analysis should be thorough and comprehensive before a project is authorized for implementation.

4.2 *The Purpose of Planning*

The purpose of project planning is to produce a project in which all the facets have been designed and examined for successful implementation. These include the physical, technical, economic, financial, commercial, organizational, management, and resource facets of projects. Project studies are essentially a tool for problem identification and solving. In planning, both problem areas and problem solutions must be well defined. This requires not only computational skills (such as those associated with project financial appraisal techniques), but also analytical skill, perception, judgement and creativity. The planning of development projects is not a simple process of selecting and applying proven technologies with a certainty of predictable results.

Planning is paralleled by appraisal which applies established sets of criteria to project data in order to test the worthiness and desirability of projects at the critical decision points. Appraisal seeks to test the viability of projects before plans have matured and before resources are committed to the projects. If projects are already announced or funded, appraisal becomes "delicate" because expectations have already been aroused, and the project is already shaped by the early, and often premature actions.

Planning and appraisal are a pre-investment testing process, involving a spectrum of "yes-no" decisions starting with the conception of the idea of the project and continuing through the study of its feasibility, and ending with the final action of authorization by the decision-makers.¹⁰ Project plans can best be understood as comprehensive and rational plans of action which are designed to be brought into reality through the logical steps of project implementation within the specified time and resource constraints. When appraised and authorized, the plans must be further refined for implementation, and further revised or reformulated throughout the life of the project as problems, difficulties, opportunities and new challenges are encountered.*

4.3 *Responsibilities for Planning.* **

Project development requires the co-ordination of organizations and institutions as well as the co-ordination of data and information. A sound planning system must co-ordinate the efforts of all relevant bodies to produce sound projects. There must also be a basic commitment to the planning system. In examining the project planning system, at this point, our major concern is with the roles and responsibilities of intra-governmental agencies. Each of these has a special relationship to a project and a special responsibility within the Project Planning System for projects requiring external financing through loans or grants.

*For an explanation of post-authorization planning of projects, see Manual I.

**See Module 31 - Decision-making System for Projects.

Operating Ministry: An Operating Ministry or Department is usually the point of origin for a project idea, and is responsible to develop the project into plans which are feasible, with special attention to technology. They must also determine the relative priority projects within their sectoral and regional spheres of influence.

Project Analysis & Monitoring Company (PAMCO): As an agent of the Ministry of Finance Secretariat of the Pre-Selection Committee, PAMCO is responsible for conducting and co-ordinating project appraisal for the government. This involves determining the relation of a project to the Investment Programme and the National Budget in co-ordination with the Budget and Economic Division of the Ministry of Finance. PAMCO is responsible for monitoring the progress of projects during both the planning and implementation phases.

National Planning Agency (NPA): The National Planning Agency is responsible for examining the priority of projects within planning and investment guidelines which establish national priorities, objectives, programmes and goals. This is important in screening projects when a variety of alternative actions are presented for planning and implementation.

Pre-Selection Committee: This is a committee (including NPA, Town Planning, Ministry of Finance -- Budget Division, Ministry of the Public Service, Urban Development Corporation, National Development Agency, PAMCO), which determines if a project is potentially desirable and feasible. It meets regularly to receive submissions of Project Profiles and project studies which are screened and pre-selected for further study. It sends recommendations to the Economic Council on the project proposals.

Economic Council: The Economic Council is responsible for examining the documentation which has been developed on a project and to review the viability and desirability of projects in light of the proposals, appraisals and recommendations presented. Decisions on the destiny of projects are made by the Economic Council who are also responsible for testing the political climate for projects.

Cabinet: The Cabinet is responsible for ensuring that projects have been legitimately scrutinized. They review the performance of the planning system and ratify the recommendations of the Economic Council on all projects. The Cabinet is responsible for reviewing

FIGURE 5

D. DECISION MAKING BODIES INVOLVED IN PROJECT DEVELOPMENT

PAMCO, PDRT
Resource
Material

DECISION MAKING BODIES

Stages	PAMCO and/or M.O.F.	Sponsoring Ministries/ Boards	Implementation Ministries/ Agencies	Pre-Selection Committee	Economic Council	Cabinet	Contractor/ Supplier
1. Identification	b	a	-	-	-	-	-
2. Preliminary Selection	b	b	-	a	a	-	-
3. Feasibility (preparation)	b	a	-	c	-	-	-
4. Appraisal (Post-feasibility Appraisal and Decision)	a/b	b	-	b	a	-	-
5. Approval and Authorization	a/b	-	-	-	a	a	-
6. Project, Design and Engineering	d	b/c	a	-	-	-	-
7. Financing	a/b	b	c	-	c	-	b
8. Contracting and Purchase	d	b	a	-	b	-	c
9. Construction	d	-	a/b	-	-	-	a
10. Commissioning	d	b	a	-	-	-	b

Note: Involvement: a = Ultimate Responsibility; b = Secondary Responsibilities; c = Support Activities; d = Monitoring Activities

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DO NOT DUPLICATE WITHOUT PERMISSION

the thoroughness of the planning to ascertain the consistency of projects with other proposed governmental directions. In the case of an appeal, the Cabinet investigates the case and recommends action as appropriate.

The above survey of agencies has only identified several of the major governmental agencies and bodies which have responsibility for project planning. Other agencies will, depending upon the nature and scope become involved within the planning, and review of projects. This is especially true of financing agencies, as seen in a discussion of the financing phase above. Specific sets of preparation, appraisal and evaluative criteria shall be applied by designated bodies with varying intensity throughout the development of a project. Similarly, the performance of the planning system itself must be tested, but the ultimate test is the success of projects which are developed and promoted.

4.4 *Types of Projects*

The distinction between projects and programmes is not sharp. Activities that form separate projects can also be treated as part of an enlarged project. In general, projects will be considered component parts of larger programmes, referring to those components which are not ongoing activities. Programmes are combinations of related projects and/or ongoing activities. Projects and programmes are closely related and may be integrated, for example, by geographical area, by sector, by type of activity or administrative units. Programmes may, however, be appraised and administered as a whole, like projects.

Projects are the prototype activity of economic and social development. The creation of new developmental capacities usually takes the form of a project. Projects generally have a definite time horizon and will generally be administratively handled as a discrete set of related activities. They have definite aims of producing flows of output or services over a definite time period to obtain either either increased productive and delivery capacities or increased efficiency of existing capacities, or both.

Because of their diversity, all projects follow the same planning process; the planning system must adapt to the needs of particular projects, just as projects must adapt to the guidelines of the planning system. Several different categories of projects can be

clearly identified. To illustrate this, we shall suggest three general classifications of projects. For each of the categories of projects, the actual planning processes may be adjusted to meet the special needs of those projects. (These categories and their characteristics are suggestive and are in no sense meant, to be exhaustive or rigid.)

Category One consists of the following types of projects:

- (a) those which are prepared primarily under the authority of one ministry or agency;
- (b) those which exceed \$½ million;
- (c) those which require external or international financing;
- (d) those which require significant foreign exchange;
- (e) those where specialized services of domestic or foreign consultants are required;
- (f) those where uncertainty or risk is high, due to the complex or unique nature of the undertaking; and
- (g) those which impinge upon problem areas such as employment and self-reliance programmes.

Projects in Category One are the types for which the Project Planning System was designed.* Although under the guidance of one executive ministry, they require the co-ordination of two or more organizations.

Category Two consists of the following types of projects:

- (a) those which are generally part of the established programmes of a ministry and can be incorporated into routine budgets;
- (b) those of less than \$½ million

* See Module 31, - Decision-making System for Projects

- (c) those which are essentially incremental, i.e., those which are simply additional to existing activities and so budgeted.
- (d) those which are relatively simple and routine in which much experience and expertise has been developed; and
- (e) those which require little co-ordination outside one agency and have minimal dependence upon external financing sources.

Projects in Category Two, may not require special capital financing or budgeting attention. They may not require both a Pre-feasibility Study and a Feasibility Study. Such projects may be taken more rapidly through the planning phase as they need little except routine review and appraisal. Facilitation of such projects, will be recommended by the Ministry of Finance and Planning during initial appraisals. However, the general guidelines for project planning, are still applicable, if condensed to facilitate early implementation.

Category Three consists of the following types:

- (a) projects too complex or comprehensive to be identified, prepared and administered within one ministry or agency;
- (b) projects of high national or regional significance;
- (c) projects which may be initiated by external agencies as part of a development assistance effort;
- (d) projects which are part of "new initiatives" of government; and
- (e) projects which require extensive co-ordination between government and outside foreign or domestic institutions and which are highly complex and present difficulties during their planning, e.g., in terms of the need for financial, technical, management and/or other special assistance.

Projects in Category Three may require some adaptation in the design of the planning processes to meet their special needs, such as the demands or traditions of donor and participation agencies.

The co-ordination of agencies complicates the planning and may involve the creation of an agency Steering Committee for that purpose. Whatever the circumstances, the system must be responsive to special needs, but must not be abused in the eagerness to advocate projects or secure funds without proper documentation, study and appraisal.

4.5 Information for Project Planning

Policies are official statements of purposes to be pursued on behalf of an organization or a society in relation to desired changes to be achieved or states of being which are intended. *Planning* is the attempt to guide and control the resources of the organization or the society through the future course of events toward those changes by prescribed activities. *Implementation* is the realization of policies and plans through concrete actions and measures. It is the critical link between intentions and achievements.

Planning involves the clarification of intentions in a hierarchy of specific objectives and outputs and designs the activities and organization necessary to realize the ambitions of the policies. The process of planning determines the desired end points and the path to reach these points. The path, the activities, the milestones necessary to reach the desired points or ends, must be described sufficiently to serve as a realistic guide to those responsible for the implementation of the plan.

Project Planning requires careful documentation of data relevant to all aspects of the project idea. In some instances, the data may be readily available and in other instances, it may be necessary to generate new data relevant to the particular project. In the early stage of planning, there should be heavy reliance upon accessible existing data, to minimize investment until a project idea has been well conceptualized and a decision has been made about the desirability and priority of the data. Further formulation and investment should be avoided on projects that have low priority. But there must be enough investment in planning to ensure that projects which will be undertaken, have been carefully and thoroughly formulated.

A project begins as a rather simple idea. Two examples of project ideas are shown below -- an industrial project and an irrigation project. Which of these projects would be preferred under today's circumstances?

Irrigation Project

A system of micro-dams can be used to irrigate an area of approximately 2,000 acres at present greatly under-utilized. It would increase the productivity of land being utilized for grazing and dry-land farming and provide some new area for farm development. The cost is estimated at \$4 million for the construction of the micro-dam system, including several diversion weirs. The time for completion of the construction is estimated at 2-3 years. International funds are available at low rates.

Window-frame Industry

The manufacture of wooden frames (from local and imported hardwoods) can lead to an attractive export industry. There is a large market in the U.S. for hardwood frames (and other installed furniture) which is not being met presently. The availability of materials and the skill of labour in Jamaica will provide a basis for this project which can become a major earner of foreign exchange. Costs of set-up will be minimal and can be organized through the Jamaica Industrial Development Corporation with supplemental loans from domestic institutions. This project can potentially employ over 100 persons directly through the production processes with spin-off employment of many more. Given the certainty of the market, a payback period of less than one year is projected from the point of start-up of the operations.

Unfortunately, every project cannot be undertaken. Every nation and organization is faced with scarce resources of some type -- persons, professionals, technicians, raw materials, energy and so on. Choice must be made between competing project ideas. When faced with deciding between projects, it is necessary to be able to make comparisons.

The selection, naturally, depends on the characteristics of the situation. but, in many situations, certain types of information on both projects is necessary to make the comparison. Let us suppose that there is limited foreign exchange savings and earnings are

important, that employment generation is important, that immediacy of return is important. Is there enough information to make a decision? The following compares the projects on an illustrative set of criteria for project selection:

FIGURE 6: TABLE COMPARING A WINDOW-FRAME PROJECT WITH AN IRRIGATION PROJECT

	Industrial Project	Irrigation Project
Investment Costs	? (minimal) ?	\$4 million
Employment Generation	100	?
Benefits	?	?
Investment Period	?	2-3 years
Payback Period	1 year	?
Use of local Resources	Proportion not known between local and imported wood	High use of local resources

Looking at a few decision criteria, it can be seen that a good comparison cannot be made between the projects. Too much information is missing. Benefits are now known for either projects. Investment costs are not known for the factory, nor the length of time required to set up the factory. Employment and period of returns are now known for the irrigation project, and so on.

The project ideas are not completely conceptualized. When an idea is fully conceptualized (even at fairly imprecise levels of planning), such as the Project Profile, it is possible to make comparisons. There would not be gaps in the information or data on the project. The above project statements are not *plans* -- they are not yet *projects*. They are merely project *ideas* -- unintegrated pieces of projects.

4.6 Project Skeleton

The backbone of project planning is the "Project Skeleton". This Project Skeleton is the basic frame upon which the project data must be built. As a project matures, the full body of the project evolves from the initial skeleton which was constructed in the Project Profile. The Project Skeleton contains the basic components of all projects. These components, answer all the basic questions about the project. Whether the stage of planning is early (Project Profile) or mature (Feasibility Study), the basic project skeleton is the same -- the completeness and accuracy of data attached to the skeleton increases as the project matures.

FIGURE 7: THE PROJECT SKELETON

1 Problem or Need	2 Objectives and Outputs	3 Demand and Market
8 Costs and Benefits	9 Project Summary	4 Technology
7 Project Life Schedule	6 Organization and Management	5 Human and Physical Resources

The documentation of a project, to make it complete and integrated, can be visualized as consisting of nine major components. These are visualized as a "skeleton", to facilitate comprehension of the project components and their inter-relationships.

If, however, any of the components is missing, the skeleton -- and therefore the basic project -- is incomplete. The Project Profile is organized around nine components. The project skeleton can be applied to all stages of project planning including Feasibility Studies, though the detail will be greater in later stages of planning.

FIGURE 8: INCOMPLETE PROJECT SKELETON

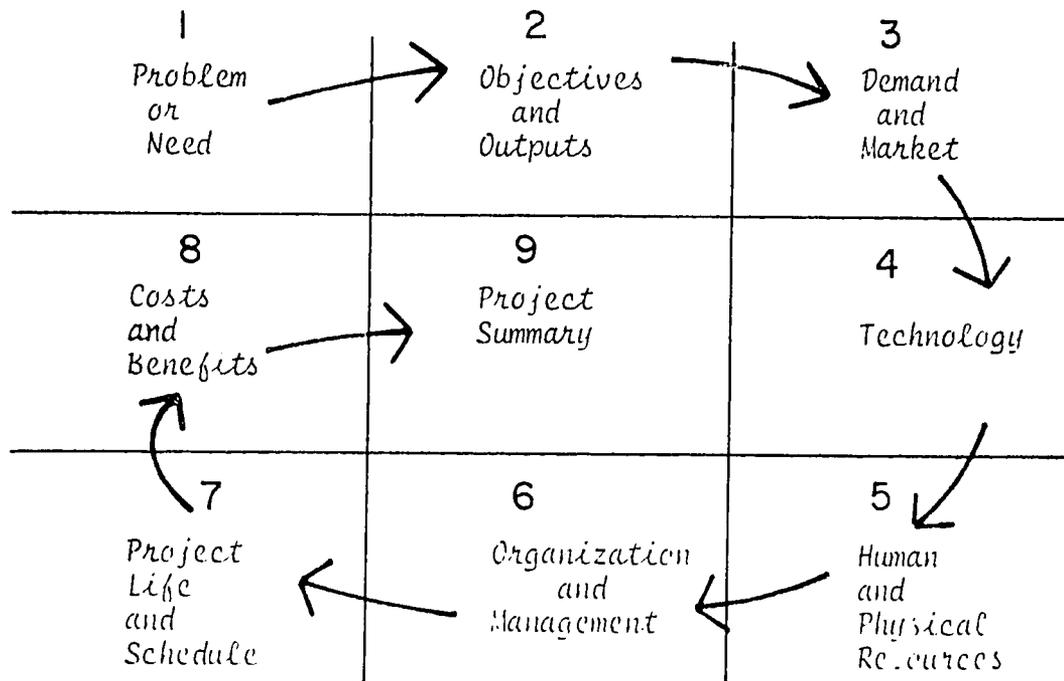
PROBLEM	OUTPUTS	?
COSTS	?	?
?	?	RESOURCES

The components of the project skeleton are interrelated, but there is a rather logical relationship beginning from the upper-left hand corner of the skeleton and moving clock-wise around the skeleton toward the centre of the summary*. (SEE FIGURE 9).

*In many project documents, the project summary is the first section of the paper -- it is however, the last to be written. The summary is a concise statement of all the most important aspects of all the other components and cannot be written until the other components are defined. It is therefore properly placed at the centre of the project components -- and at the end of the logical preparation process for projects.

In general, the logical flow illustrated in Figure 9 follows the components of the project skeleton, used for the preparation of projects. The *problem* leads to a statement of the *objectives*. The hierarchy of objectives results in specific *outputs*, for which the *demand* and *market* must be determined. The demand for the outputs of the specific project give the general level of production of goods and services which is a major determinant of the project *technology* (though not the only determinant). When technology is determined, it is possible to identify *material* and *human resource needs* of the project. When the resources are identified, the *organization* of the project can be determined by identifying all sources of all resources. Then it is possible to *schedule* the project as all activities necessary to mobilize the resources and integrate them into the project technology are known. And finally, with the project scheduling and timing complete, it is possible to value the *costs* and *benefits* of the project over time. The salient point from these components all become part of the *project summary* which is written as an overview of the project for the reader of the plan.

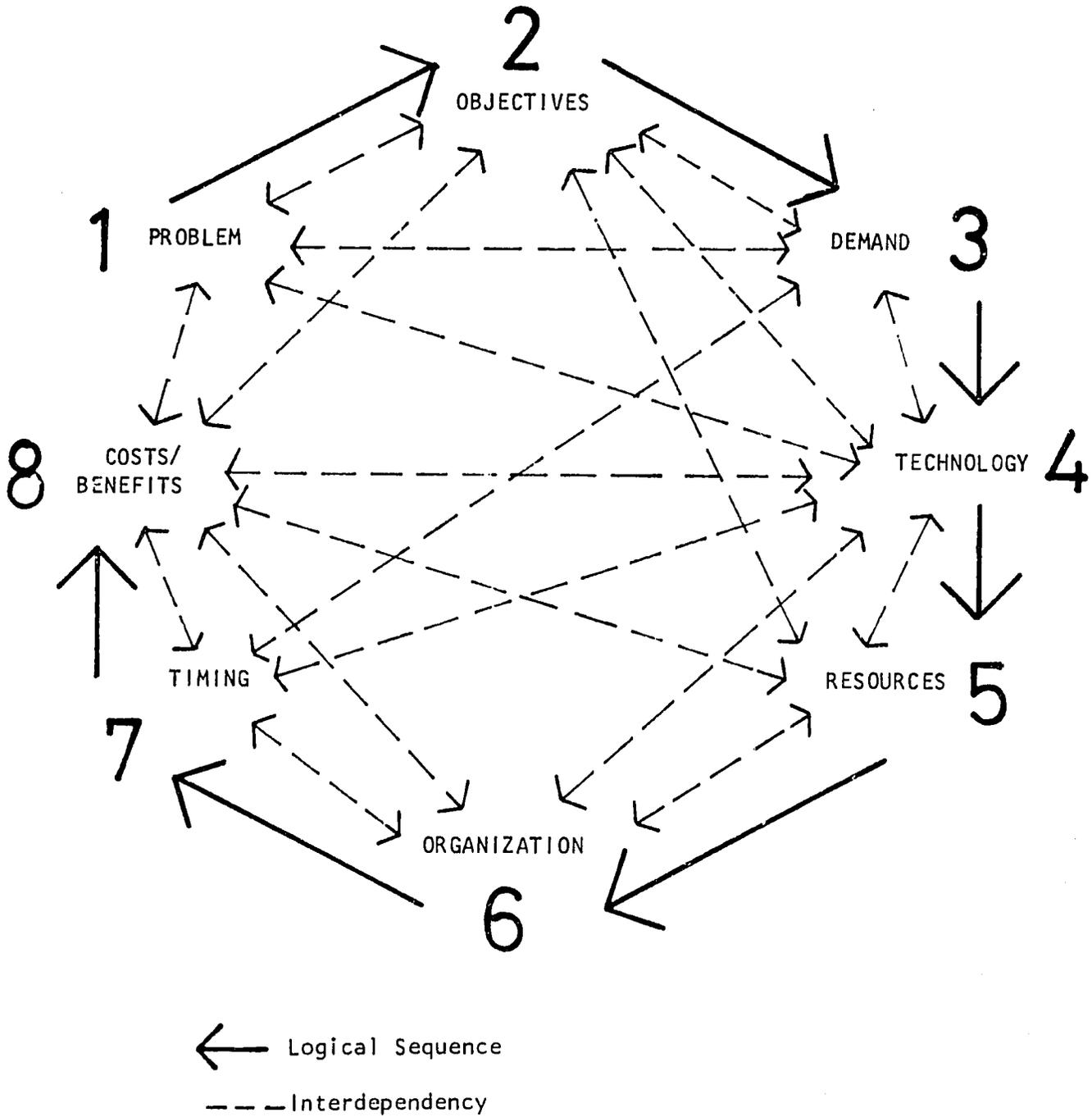
FIGURE 9: LOGICAL SEQUENCE OF PROJECT SKELETON COMPONENTS



Although projects may be identified in many ways, the project planning process should begin with a statement of the problem or the need which is being reduced or solved by the development project. Clarification of the need is therefore, the basis of all further planning. The rest of the components is therefore, the basis of all further semblance of order. The order is not strict, however, but for illustration only. One may find, for example, that once the resources are surveyed, it is necessary to go back and reconsider or redesign the Technology. Or once cost and benefits have been calculated, there is a need to return to some of the former components for re-shaping or re-design. In this way, all components of the project skeleton are organically interrelated.

The logic of the project skeleton is only illustrative. There is actually a very complex set of relationships between the project components, and this complexity increases as the project evolves in the later stages of planning. There is naturally a lot of reiteration of later steps as approximations of first estimates become more firm within each of the planning stages.

FIGURE 10: ILLUSTRATION OF INTERDEPENDENCY
BETWEEN PROJECT COMPONENTS



COMPONENTS OF THE PROJECT SKELETON

V. COMPONENT ONE: PROBLEM OR NEED STATEMENT

1 Problem or Need	2 Objectives and Outputs	3 Demand and Market
8 Costs and Benefits	9 Project Summary	4 Technology
7 Project Life and Schedule	6 Organization and Management	5 Human and Physical Resources

5.1 Purpose

The purpose of this component is to develop a clear, concise statement of the specific problem(s) which the project is trying to solve, i.e., to state a clear focus for the project. It will include a statement of the magnitude of the problem and a projection of the consequences or trends if the problem is not resolved. Problems in a development context are very complex and are generally related to other problems and conditions in the project setting. The problem statement should include some description of the general characteristics of the project area relevant to the problem, but should clearly delineate the problem(s) to be resolved, so that the project can be evaluated in terms of its impact upon completion.

5.2 *Relation to Other Components*

The Problem or Need Statement, is the foundation for all the other planning components. As other components are designed, it will be necessary to have the statement as a background against which to test the relevancy of the solutions inherent in the total project design.

As project design progresses, it may be necessary to develop increasingly detailed data on the nature of the problem or conditions relevant to the problem so that the project design can effectively address the changes sought. Clarification and refinement of the problem will continue throughout the entire planning exercise. Problems are not static, but dynamic. They are intimately and intricately bound by the dynamics of the project setting, so constantly shift in intensity, priority, and focus. Therefore, planners need to be constantly reviewing the problem, even though there has been a clear definition for project focus at the beginning of the planning process.

5.3 *Developing the Problem or Needs Statement*

Development projects are intended to solve or reduce some problem or meet some need.* This is done primarily through the development of the capacity for production of new or additional goods or services. It is too common to jump quickly from a superficial understanding of the problem to a solution, from a felt need for a project to a particular project design. The leap from felt need to the solution should not be made too quickly, or the project may miss the mark. Frequently projects are designed and carried out -- but do not have their intended impact because the nature of the problem was not correctly understood. And just as frequently, it is necessary to re-design a project completely at some mid-implementation point because it is not addressing the problems appropriately. A clear understanding of the problem is the best foundation for sound project planning.

Although all development projects are designed to solve problems, there is often not much effort devoted to clearly defining the problem. Even where there is a clear and concise problem statement, they are too often advanced with too little analysis. Several faults of the project may be observed in the statement of a problem. Statements may be so

* See Module 23 - Cost-Benefit Analysis

narrow that they are not meaningfully related to their broader context of the project. Statements may be so broad that they cannot be meaningfully used as a foundation for establishing specific objectives with sound quality and quantity indicators. Statements may be so fragmentary, that the design does not address the total problem in any consistent manner. Though it is difficult to make clear, concise problem statements, it is very important. Problems must be defined within their total situation in both broad and specific terms. Through this process, the project is focused on specific problem resolution or reduction.

Problems begin with the feeling of a need, such as a need for change, a need for something additional, a need for something new or different. The initial problem may be either very general or very specific. In either case, it is necessary to sharpen the understanding so that the problem becomes "Structured". Structuring a problem requires clear statements of:

- a) the symptoms of the problem;
- b) the consequences, results or conditions resulting;
- c) factors contributing to the problem;
- d) general conditions relating to the problem;
- e) social, economic and technological and environmental factors contributing or influencing the problem; and
- f) relationships to other problems, and their symptoms.¹¹

It is particularly important to differentiate

- 1) between symptoms and the problem; and
- 2) between the problem to be addressed and the general configuration of the problems related to this basis problem.

Although symptoms must be often removed to solve the problem, they are not the problem. In general, there are feelings of frustration and tension which may lead to specific incidents or feelings which are the symptoms of a problem. Analysis of the incidents and feelings to certain generalizations concerning the nature of the problem. This analysis can become the basis of problem formulation. A problem must be identified before it can be solved.

Systematic approaches to problem and need identification have been developed. They can be used by the project planning team to sharpen the focus of the project at the beginning of the planning process. For example, *force-field analysis* can be used to identify positive and negative forces and their relative strengths in determining the status quo, and by implication, the factors which must be considered to bring about the desired change of the project. *Needs analysis* is a useful technique to get to the root of problems, i.e., major precursor of problems which are leading to the specific problem addressed by the project.*

Problem analysis must be based upon a good understanding of the economic and social setting.** If properly conducted, it can lead to a wealth of information of the project design. As the structure of the problems emerges, it will be necessary to have information about the project area. The success and failure of projects will depend upon the adequacy and quality of the physical and human resources of the general area embraced by the project. *Project area analysis* can be brief, but should state clearly the existing state of development through a review of relevant data. The data will generally establish the suitability of the resources required for the project (as these are determined in later planning components) and will establish the relative priority of this specific project in its sector and location. The information drawn upon in studying the project area may include:

- a) physical resources and natural characteristics;
- b) population, employment and population characteristics, such as density, rates of growth, structure, employment, etc;
- c) economic and social infrastructure, including assessment of transportation, communication and other links between and within economic sectors and activities;
- d) land use patterns;
- e) human resources; and
- f) institutions and existing infrastructures.¹²

*See Module 29 - Project Selection Analysis
Module 30 - Brainstorming

**See Module 16 - Project Area Analysis
Module 32 - Environmental Analysis and Institution Building Model

Project information can be used to forecast the magnitude of the problems, and illustrate the need for a project to be undertaken. It can also be useful to detect major obstacles to successful project implementation, so making it possible to design the plans so that obstacles are overcome, avoided, turned into opportunities or controlled. Examples of obstacles that could be present may include operational deficiencies environmental points of resistance, negative behaviour patterns among target populations, resources deficiencies, and so on.

Information about obstacles may be derived from relatively simple analysis and observation, from discussions and brainstorming, and from simple surveys and studies. If the information is not well substantiated, it may be necessary to prolong planning to make a more objective analysis for determining the actual nature of significant obstacles, or determining the reasons or causes for the deficiencies, and for judging their relative degrees of impact upon the project. Force field analysis, along with a ranking of the influential obstacles, can assist in the incorporation of strategies for circumventing or possibly eliminating the obstacles.

It is of little value to hide, ignore or underestimate obstacles or problems, though this is often done to make a project attractive and competitive. Such an approach can result in unsuccessful projects at the implementation stages, despite their formal acceptance and authorization. The consequence may be costly project overruns or inability to repay project loans from the project returns. Unsuccessful implementation due to faulty or over-optimistic planning, only reinforces the cycles of failure and dependency which the development projects are designed to overcome.

Finally, the history of the project is an important part of the problem analysis. How was the project idea conceived? Where did it originate? What are the related studies or factors which led to project identification? When was it initiated? Who has supported it? What has been done already about it? All of these can strongly influence project design and project implementation. The project team should get a good understanding of the history of the project to date and the influence of that upon the design or the implementation. Though the date actually written in the project plan may give only a summary of the project history, the planners need to have a detailed knowledge of the events leading up to project identification and formulation and of the persons involved and their interests.*

*See Module 26 - Social Analysis

5.4 *Techniques and Products*

A number of distinct products will be generated as planning documents from this project component. As a minimum, the final results will be:

- a) Problem Statement
- b) Project Area Overview
- c) Forecast of the Problem
- d) History of Project Idea

Several techniques have been mentioned with respect to the development of the planning documentation. These include Problem or Need Analysis, Force Field Analysis, Forecasting or Projection, Problem Impact Analysis and Brainstorming.

In addition to the final products, there will be several supporting sets of documents, including Analysis of Obstacles, Detailed History of the Project, Problem Impact Analysis, Problem Diagram, Policy Programme Reviews and information about the project setting and area.

5.5 *Relevant Training Modules*

- Module 1 - Defining Project Objectives
- Module 14 - Demand Analysis
- Module 15 - Market Analysis
- Module 16 - Project Area Analysis
- Module 29 - Project Selection Analysis
- Module 32 - Environmental Analysis

VI. COMPONENT TWO: PROJECT OBJECTIVES

1 Problem or Need	2 Objectives and Outputs	3 Demand and Market
8 Costs and Benefits	9 Project Summary	4 Technology
7 Project Life and Schedule	6 Organisation and Management	5 Human and Physical Resources

6.1 Purpose

The purpose of this component is to formulate a clear statement of the objectives for the project. Objectives are positive statements of the changes to be brought about by the project to solve the problem(s) identified in the Problem Statement. The objectives should be clearly linked in a hierarchy from the lower-level objectives of project outputs through statements of higher-level objectives defining the purpose of the project to the highest objective which defined the intended overall impacts of the project activities.

6.2 Relation to Other Components

The Objective Statement forms the foundation for the later components of Demand Statements and Technology Selection through the definition of specific outputs of the project which must be produced and "marketed". The objectives often provide the boundaries for project design in terms of benefits, organisation, resource use, and costs. The guidelines which are explicit or

implicit in the statement of project objectives become critical factors in considering alternatives in all components of the project plan.

6.3 *Developing Project Objectives and Project Outputs*

One of the features of development projects is that they are objective-oriented. That is, the projects are designed to resolve certain problems by achieving specific objectives--and within specified time and resource constraints. By establishing a clear and concise statement of the objectives of the project very early, it is possible to ensure that the focus of the project is maintained throughout planning and implementation. Any changes in the project objectives will require a policy decision from the project executives.

Every project plan requires a very clear statement of project objectives which establish the purpose for the project and the specific outputs and the intermediary outputs required to achieve that purpose. The statement of project objectives gives the first formal structure to the boundaries of a project. They form the guidelines for other aspects of the project design from demand and technology to organization and costs.

An objective is a specific statement of purpose expressing a desired end, usually a state that is to be achieved at some time in the future. Every project has a hierarchy of objectives. Some objectives are *primary* while other objectives are *complementary*. Supportive of the primary objectives are lower-level objectives which are the "means" of achieving the primary or higher level objectives, the "ends".*

The relationships within a hierarchy of objectives can be observed in the following example. A project of soil conservation may be proposed for a water shed area. One of the objectives of such a project will be:

to control soil erosion in the water shed

There may be several means of achieving that end. Among these could be:

- (a) reforest the water shed;
- (b) construct bench terraces for agricultural hillsides;
- (c) adopt less drastic soil conservation measures; and
- (d) abandon the water shed for natural plant growth.

* See Module 1 - Defining Project Objectives

Each of these could represent a lower level objective (means) for achieving the higher level objective of controlling soil erosion in the water shed. It may be possible to combine several of the means, e.g., 1, 2, or 3, to achieve the higher objective. This objective can also have still higher level objectives, such as:

- (a) increasing agricultural production in the area;
- (b) increasing intensity of land use in the area.

These higher level objectives may have still higher level objectives, such as:

- (a) to improve the standard of living of farmers in the water shed by increasing incomes.

From the example, SEE FIGURE 11, there is a hierarchy of objectives which is logically linked between the levels. As one moves from a lower level objective, one may ask the question "Why" to define a higher level objective. Consider the following example:

objective: *to adopt soil conservation measures*
 logical link upwards: "WHY?"
 higher level objective: *to control soil erosion*
 logical link upwards: "WHY?"
 higher level objective: *to increase agricultural production in the area*
 logical link upwards: "WHY?"
 higher level objective: *to increase farmer incomes.*

From higher level objectives, it is possible to define lower level objectives by asking the question "HOW".

objective: *to improve the standard of living of farmers*
 logical link downwards: "HOW?"
 lower level objective: *by improving farm incomes*
 logical link downwards "HOW?"

lower level objective: by improving agricultural productivity

logical link downwards: "HOW?"

lower level objective: by controlling soil erosion and increasing intensity of land use

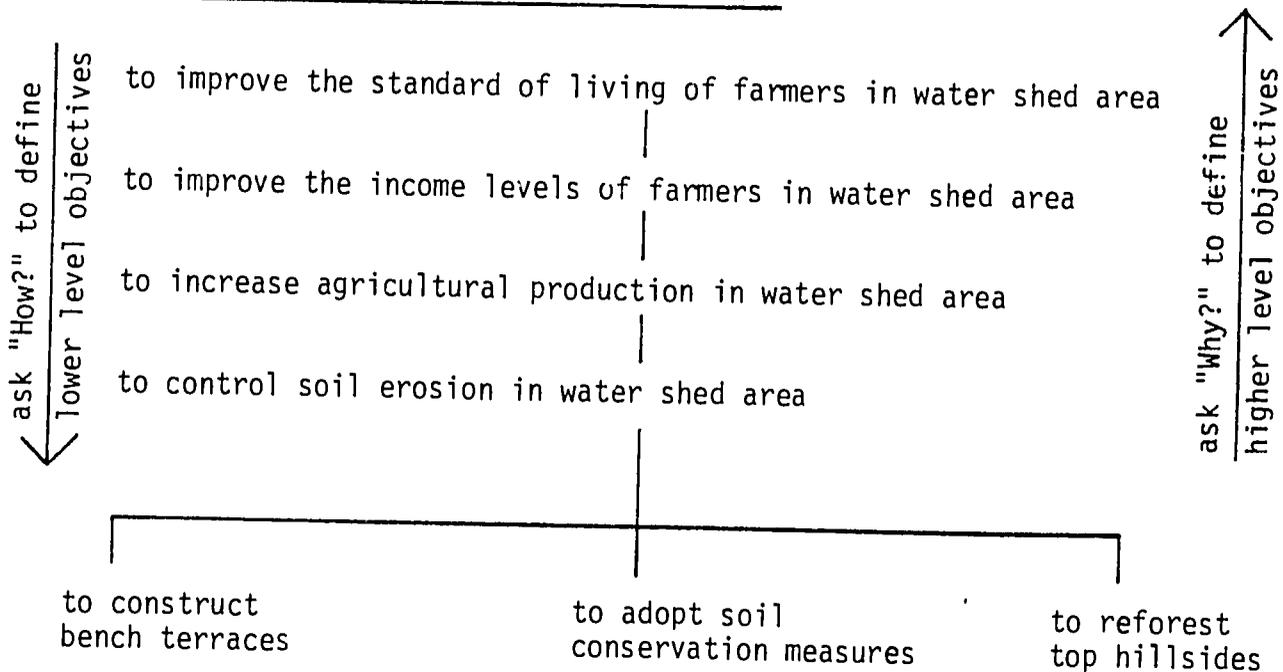
logical link downwards: "HOW?"

lower level objective: by constructing bench terraces

Starting with any objective, it is possible to construct a hierarchy of objectives, both lower-level objectives and high-level objectives, by asking the questions "How?" and "Why?" as demonstrated above.

The construction of the hierarchy of objectives for a project makes the logical foundation of the project quite clear and eliminates possibilities of confusion regarding the relationship of various objectives within a single project. SEE FIGURE 11 for an example.

FIGURE 11: EXAMPLE OF AN HIERARCHY OF OBJECTIVES



A hierarchy of objectives is a chain of ends-means which is no stronger than its weakest link. For example, in the case of a project to expand dairy production, the lack of adequate marketing structures may lead to project failure despite high increases in milk production.

Lower level objectives must be able to achieve higher level objectives. We can ask "Why?" is each lower level objective included to find the statement of a higher level objective and "How?" is each higher level objective to be obtained to find lower level objectives.

In establishing objectives, it is important to answer some basic questions regarding the needs which have been identified. An important question is "whose needs? what is the target group?". Are they to be defined on the basis of age, economic class, geographic location, behaviour patterns, etc. Other key questions direct the analysis to the "*systems*" within which the target group lives. Establishing the project objectives is usually a process which involves the planning team and the project administrators as well as inputs from potential beneficiaries or other groups with interest in the project. Approval of the objectives at the level of policy-makers is required to achieve a very clear statement of intention very early in the planning of the project.

After the *purpose* of the project has been clearly stated and is accepted there must be a corresponding statement of the *outputs* required to achieve the purpose(s)*. Project outputs may be final outputs or intermediate outputs. For all of these outputs, there should be some attempt to quantify, so the progress of the project and its impact can be measured, monitored and evaluated. Project Objectives are foundation for not only planning, and evaluating a project, but for controlling its implementation.

The objectives, once stated, will have to be verified and clarified throughout the planning process. They become the background for most project decisions, such as project costing, project design, project location, and they in turn, will be modified if subsequent planning shows that the objectives are not realistic. They may have been over-ambitious or may not have been ambitious enough, or they may not be as complete or as comprehensive as they should be.

A frequent problem in the statement of project objectives is that they tend to be very general so as to achieve a broad base of support for the project, but may be internally conflicting. People support projects for a wide range of reasons and the accomplishment of any specific objective may have a broader range of impacts than is recognised in the initial statement of objectives. As an example, improving public housing in one area may overload the transportation system. Or again, raising the level of standards of living

* See Module 2 - The Logical Framework

may increase the strain on foreign exchange.

The establishment of objectives is a complex process for these reasons:

- (a) objectives for the same project differ according to the group or the organization supporting the project;
- (b) there is usually more than one objective that an entity would like to achieve with a project;
- (c) objectives in different dimensions have varying priorities (with regard to the time, resources, finances, output levels, etc.);
- (d) objectives may be in conflict with each other;
- (e) objectives are intricately interrelated in complex ways which are often unclear until the project is in progress;
- (f) objectives within a single project often shift in priority; and
- (g) objectives relate to different dimensions of the socio-politico-economic world with complex and relatively unstable relationships which change over time.¹³

In general it is possible to give the following guidelines for testing the validity of objectives:¹⁴

- i) the time period of achieving the objectives should be specified as part of the terms of reference;
- ii) the specific problem to be solved (or reduced) should be clearly identified and some quantifiable indicator should be determined. (It is important that an indicator be directly or indirectly measurable, so that the objectives can be tested for realism and so that the project can be evaluated for performance);
- iii) all operational outputs required for the project should be identified and quantified as part of the ends-means chain required for achieving the project purpose; and
- iv) the statement of objectives must be *specific, realistic, integrated, performance-oriented, and operational.*¹⁵

Although project ideas may be generated from a variety of sources, the objectives of a project are related to the reduction or resolution of some specific problem(s). The objectives must be reviewed against background information

about the problem statements and in light of relevant sources of policies. For example, project objectives must be stated to be consistent with the following:

- (a) the goals and policies of sectoral and national plans;
- (b) the public policies of national leadership;
- (c) the specific objectives of community or other associated groups;
- (d) the objectives and criteria of potential funding agencies; and
- (e) general internationally accepted standards and policies.

This statement of objectives must establish at a minimum,

- i) the population groups having priority;
- ii) the geographical groups having priority;
- iii) the problems having relative significance or priority; and
- iv) the time periods in which purposes are to be achieved.

Often there will be general guidelines within which projects must fall if they are to be authorized, funded and implemented. These guidelines vary from time to time in light of the changing priorities of government, funding agencies, contributing supporting agencies, and so on. The planners must recognise the importance of the setting in which guidelines are being established and expressed. Objectives must be stated in such a way as to reflect the policies and priorities of the authoritative environment of the project.

6.4 *Techniques and Products*

The final product of this component is a clear statement of the project objectives. This means that the higher level objectives will be clearly stated as well as the specific outputs for the project. It is customary to identify at least three levels in the hierarchy of objectives--

Overall Project Goals.

Project Direct or Immediate Purpose(s).

Project Outputs.

For each of these levels of outputs, there should be qualified and quantified indicators of achievements. These are usually called targets and indicate the amount of change intended, such as levels of production or degrees of problem reduction.

The statement of project objectives must be supported by a number of planning documents, e.g.:

- (a) guidelines from relevant policies of the government;
- (b) data on the severity of the problem and the desired results;
- (c) references to similar projects and experiences or lessons relevant to specific project designs;
- (d) guidelines from "key persons" such as political directorate, community representatives, beneficiaries, etc., who have definite expectations from the project; and
- (e) specifications of operational and project outputs as appropriate. Some of the techniques and tools applicable to this component are described in more detail in the following modules of this series:

Objectives Trees, (Module 1);

Objective Indicators, (Module 1);

Logical Framework, (Module 2);and

Ends-Means Analysis, (Module 1).

In addition, a number of process techniques will be useful to the groups involved in determining the objectives, e.g., Brainstorming and Force Field Analysis.

6.5 *Relevant Training Modules*

- Module 1 .. Defining Project Objectives
- Module 2 - Logical Framework
- Module 16 - Project Area Analysis
- Module 29 - Project Selection Analysis
- Module 30 - Brainstorming.

VII. COMPONENT THREE: DEMAND AND MARKET ANALYSIS STATEMENTS

1 Problem or Need	2 Objectives and Outputs	3 Demand and Market
8 Costs and Benefits	9 Project Summary	4 Technology
7 Project Life and Schedule	6 Organisation and Management	5 Human and Physical Resources

7.1 Purpose

The purposes of the Demand and Market Analysis Statements are (1) to specify the level of goods or services which exists, (2) to identify the level of output for the project, and (3) to identify a strategy for ensuring that the project outputs actually get to the target population as intended; to achieve the desired project impact. The *Demand Statement* will identify the specifications of the output and should verify that this is appropriate to the "effective demands" for the project outputs among the target populations. The *Market Statement* complements the Demand Statement by showing how the project output will get to the consumer or beneficiary and who has responsibility at the various stages or for the various activities involved in ensuring that this happens.

7.2 *Relation to other Project Components*

This component is based on the Statement of Objectives, and is used to refine the objectives, especially the definition and quantity of Project Outputs. It becomes the foundation for identification of alternative technologies for the project for technology selection *which is partially determined by output specification and levels of production for the goods and services*. It assists in determining the technological level, scope, size and perhaps plant location and even building layout. Although technology may be decided before the Demand Statement is complete, the Demand Statement becomes a determining factor for the appropriateness of the chosen technology.

The Market Analysis Statement affects project design, especially organisation, as it determines the extent to which the project organisation must ensure that the beneficiaries receive the product, either directly or through liaison with complementary organisations. It is also a determinant of the "benefits" to be recovered or returned through project activities.

7.3 *Developing a Demand and Market Statement*

Demand Analysis is primarily a detailed study of the need for the project output*. This component must be closely related to the project objectives and outputs because the study of the need for the output may lead to modifications of the initial statements or specifications of project outputs. When the demand analysis is complete, there is a definition of the exact nature and quantity of the outputs for which an effective need has been established.

Demand Analysis is a study of the specific need for the project, i.e., its outputs. It applies not only to projects which produce for the commercial market, but to all "productive units or infrastructures". For some projects, the output is sold in a commercial market, such as crafts, clothing, farm products, etc. Other types of project product outputs which may be "consumed" or absorbed in employment, e.g., the training of engineers, plumbers, nurse aids, project planners, etc. Still other projects have outputs which take the form of services, many of which do not demand a direct payment for the service, such as roads, hospitals, water schemes, and so on. Still another type of project may result in structural reform or change, such as improving the efficiency of existing delivery systems or administrative systems. In all of these projects, the study of the need for the project or Demand Analysis, is applicable.¹⁶

*See Module 14 - Demand Analysis

The Demand Analysis is an important component of a project study, especially at the feasibility level. The Demand Analysis verifies the initial problem statements and the hierarchy of objectives by identifying and quantifying the conditions under which the project outputs will be used or consumed.

The study of the need for the project outputs lays the groundwork for subsequent project components. It becomes the basis for decisions with regard to technology, such as size, location and processes. It permits the assessment of project costs and benefits which need to be specified, identified and measured with some precision in the advanced stages of project study.

Demand Analysis deals with the concept of a "*market*" for the project outputs. "*Market*" is used in its broadest sense to denote that there is a study of both the *demand* for and the *supply* of the project outputs. It includes outputs such as goods or services that are normally considered "free" in the sense that the existence of a rate of exchange or direct market price which consummates the transaction is not linked with their use or consumption--such as, schools and roads. The clarification is important because many (certainly not all) of the goods and services which are outputs of government or public projects are not sold in the market or at the prevailing market prices¹⁷.

It is necessary to establish the "*effective demand*" for project outputs. It is not enough to suggest that there exists a "general or moral" need based upon the "needs" of mankind. "Effective Demand" means that someone not only wants the product, but also that someone is willing and able to pay for it.¹⁸ Every output has to cost somebody even though the direct beneficiaries or users do not pay in the ordinary sense of a direct exchange of money for the product. The costs of hospitals and schools as well as highways are usually paid for out of government budgets. Many government projects are subsidized in the social or economic interest. Demand for these kinds of project outputs must exist with the same certainty that demand must exist for outputs to be sold commercially. In such instances, establishing effective demand may mean separate studies of the consumers and the *willingness* and *ability* to pay for the output. With some outputs, the need and the potential number of consumers may far outstrip the ability of the government, the private sector or whoever is responsible for financing the project to pay. In this case, effective demand is based not upon the need, the social pressures or demands for a project, but upon the capacity to support the project by the funds of those who "pay" for it. It is very important that project demand analysis focus upon effective demand and not some more abstract or general form of demand or need for project outputs.

Since the purpose of a project is to supply specific goods or services (called outputs) to a certain community or group of person, it will be necessary to estimate the *volume* of the outputs which are required. There are two main levels of analysis. The first is concerned with the total demand or market for the output. The second is concerned with the market for the project (and for competitors). In assessing the *total market*, there are three basic factors¹⁹:

- (a) the present size of the market which can be measured by estimating total consumption by users and total production by suppliers;
- (b) the apparent rate of growth of the market in terms of both supply and demand; and
- (c) critical factors influencing the growth of the market or the demand for the output--often called demand determinants.

For a number of reasons, the present size of the market does not usually reflect effective demand for goods or services. Development projects are usually designed to overcome some gap in the provision of developmental goods or services. It is usually assumed that there is a certain level of unsatisfied demand. Demand Analysis attempts to define this level and determine the place of the project within it. This is why the planners must know the probable growth of the market and what the demand determinant factors are. In the case of final *consumer demand*, the strongest determining factors will be population, per capita income, substitution possibilities, taste preferences, and prices (including the effects of subsidies).

Demand of producers, on the other hand, is usually derived from consumer demand, or created consumer demand and is determined by investment possibilities and climate. Other producers may use goods or services from the project only insofar as it is needed as an intermediary input to their final production. This is not as easy to estimate as final or consumer demand.

In assessing demand, it must be clear what the nature of the demand is and where it can be determined. The production of the project may be added to present volume of production or may attempt to replace part or all of the goods or services which are presently being produced. It is important to remember, however, that the determination of volume of demand can only be made at specific prices or values. The "value" is a basic assumption in analysis of demand.

The part of the total market which the project can claim depends partly on the structure of the market, the costs of production and distribution for the project, the nature of extra project or environmental support

and marketing policies. Thus, it is not only important to know the total market, the determinants of growth of the market, but to know also the extent to which the project outputs fit into the total demand and supply situation.

Depending upon the stage of development, the general *data requirements* include:²⁰

- (a) uses and specifications of the goods or services to be produced;
- (b) prices and costs;
- (c) user of consumer preferences;
- (d) statistical series of past and present demands;
- (e) statistical series on determinant factors;
- (f) sources of supply;
- (g) distribution mechanisms;
- (h) competitive goods or services; and
- (i) relevant economic policies or regulations*.

These data, when merged with considerations of trends and determinants, provide an understanding of the current demand situation required for demand projects. Proposed project outputs will be produced at some point in the future. Estimation for the project (costs, production, benefits) can be derived statistically from projections through the life of the project based on data from the past and current situations. It is important to have a comparison of what contribution the project will make in supplying the particular goods and services with the case if there is no project.

The normal procedure involves forecasting. This can be simple extrapolation of historical trends, comparisons based upon similar market situations (on the international or domestic scene), regressions determining relationships of determinants, elasticities, supply-demand curves, and so on. In general, however, the application of these techniques requires a great deal of judgement and careful interpretation to ensure that the assumptions of forecasting and determinant relationships are reasonable and that they reflect anticipated economic and structural changes which may affect the project.

* See Module 39 - Pre-Feasibility and Feasibility Study Formats

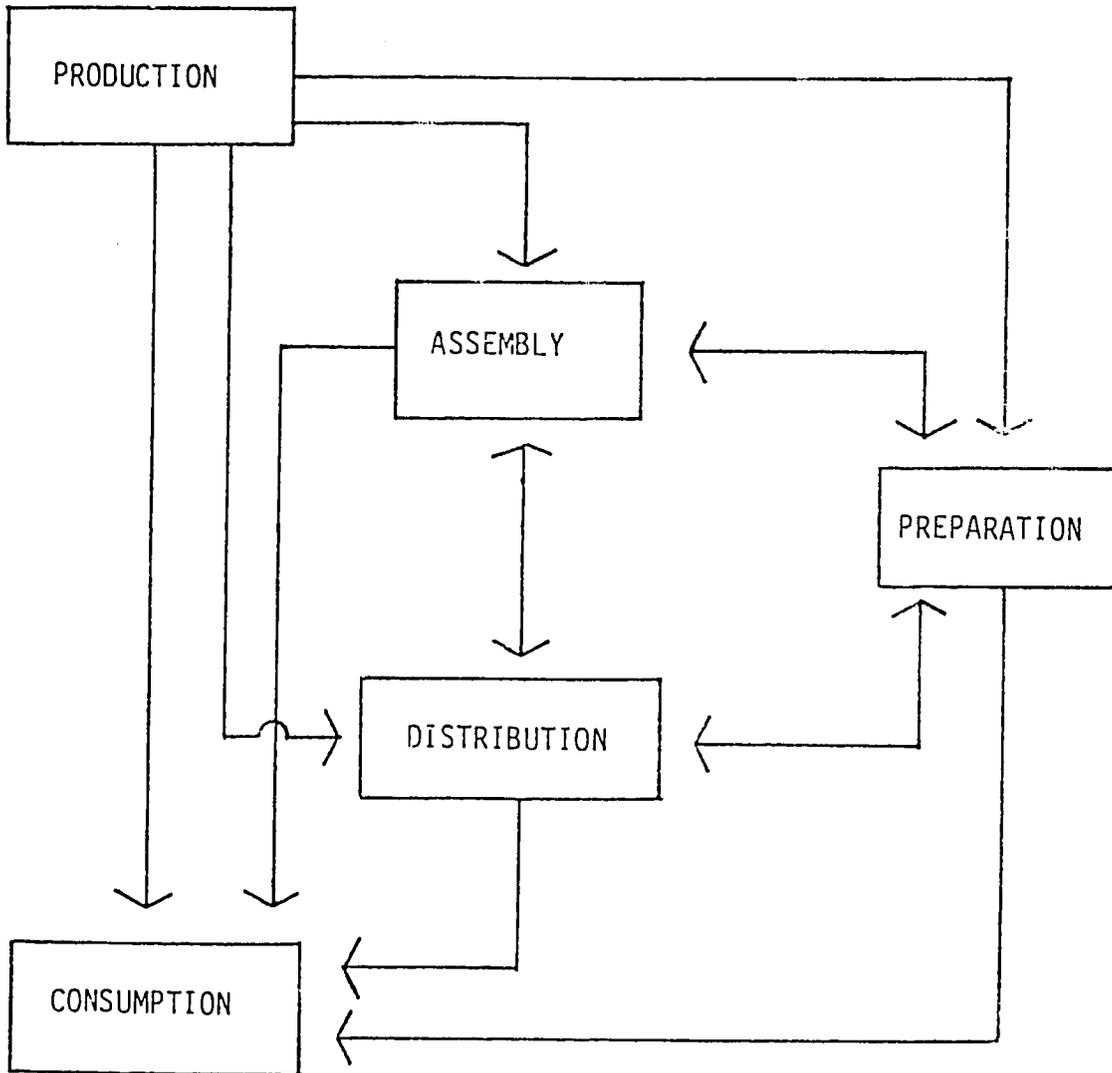


FIGURE 12 MARKETING FUNCTIONS AND MARKETING FLOWS

What is determined from analysis of demand must be used to study the supply side, and eventually also technology and input constraints affecting the project. Overall demand statements in a feasibility study are often presented in terms of *best estimate analysis*, or *worst case analysis*, and reflect a range of demand based upon sensitivity analysis on selected values for key demand determinants or parameters affecting the demand or the supply of the outputs.

There is much discussion of the techniques of demand analysis which focusses upon determination of the level or volume of demand*. A frequently overlooked aspect of demand study is *Market Strategy*, i.e., how the outputs will be delivered from the point of production to the point of consumption, or in the case of stationary outputs such as roads or services (restaurants), how the consumers will be assembled to the points of utility. This is the *Market Analysis Statement*.

A study of the overall market in terms of understanding the processes of moving from production to consumption is vital to a successful project. This involves analysing the assembly, distribution, preparation, and consumption of the output. (See FIGURE 12). A number of important roles are associated with the various functions which *must* be performed for an *effective demand to be "effectively tapped"* by a project²¹. These may include storage, transport, grading and standardization, packaging, risk bearing, financing, information processing, buying and selling. If an effective demand is identified, but not mobilized, the project is also doomed to failure. Too often the determination of market strategy from a detailed study of the market processes, functions and roles is incomplete or delayed until implementation, and is a cause for project breakdown or later under-achievement.

7.4 Techniques and Products

There are several distinct products from this components, such as:

- (a) specifications of project output(s);
- (b) projections of overall demands and trends;
- (c) pricing and costing and other relevant assumptions for demand projections;
- (d) demand projections for the project;
- (e) marketing strategies for the project outputs; and
- (f) identification of marketing responsibilities.

*See Module 15 - Market Analysis

These products must be supported by a number of planning documents which include:

- i) statistical series on total market;
- ii) statistical series on determinant factors;
- iii) international comparative analysis (as appropriate);
- iv) market flow analysis;
- v) analysis of distributive mechanisms;
- vi) analysis of competitive goods, services and/or enterprises;
and
- vii) relevant economic policies and regulations.

Techniques which are useful and relevant to the planning of the component include:

Forecasting and Trend Analysis

Average Change Forecasting

Regression Analysis

Elasticity and Determinant Coefficients

Supply Demand Analysis.

7.5 *Relevant Modules*

- Module 13 - Project Technology
- Module 14 - Demand Analysis
- Module 15 - Market Analysis
- Module 16 - Project Area Analysis
- Module 17 - Project Costs and Benefits
- Module 26 - Social Analysis
- Module 32 - Environmental Analysis
- Module 39 - Pre-Feasibility and Feasibility Study Formats.

VIII. COMPONENT FOUR: PROJECT TECHNOLOGY SELECTION

1 Problem or Need	2 Objectives and Outputs	3 Demand and Market
8 Costs and Benefits	9 Project Summary	4 Technology
7 Project Life and Schedule	6 Organisation and Management	5 Human and Physical Resources

8.1 Purpose

The purpose of this component is to determine the best technology for project implementation. To make this determination, it is necessary to examine different technological approaches to producing the project outputs and testing different aspect of the alternatives (size, location, processes, etc.) before selecting and designing the most appropriate technology for a specific project. The technology statement includes specifications on output levels, productive processes and requirements, technical characteristics and required supporting activities, such as organization, technical skills and management.

8.2 Relation to other components

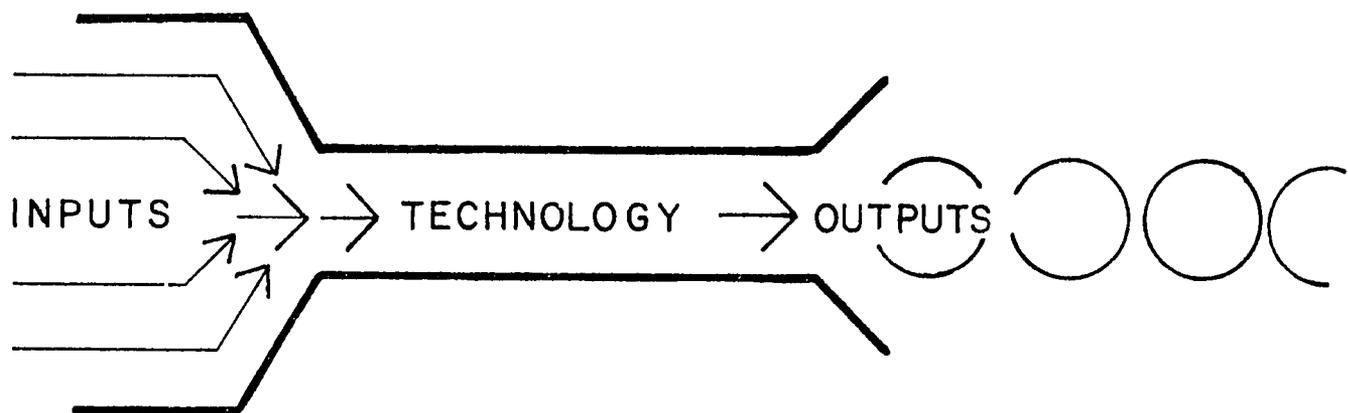
Project Technology is determined to a great extent by the Statement of Project Objectives and Demand Statement. It can also lead to modifications or re-examinations of either of these from which definitive guidelines on constraints for specifications of the goods or services, levels of production and "conditions" of production are derived.

When a technology has been selected and all aspects of the design determined, the components which depend upon technology can be planned. The choice of technology is the most important foundation for project cost estimation, project scheduling, and determination of resource requirements. It also has a great impact on the organization of a project. There must be a correlation between technology and other components. The choice and analysis of technology cannot be limited to technical considerations. Modifications in project design and technology may be necessary due to the conclusions reached in the planning of other components of the project, such as timing, resource availabilities, cost constraints organisation and demand.

8.3 *Selecting a Technology & Developing a Technology Statement*

Technology has been defined as the organisation and application of scientific knowledge for the achievement of practical purposes.²² The technology Statement makes reference to both *whether* and *how* a project can be put into effect. Technology for a project refers to the combination of certain material inputs through particular sets of processes to produce goods and/or services. (See FIGURE 13). The combination of raw and intermediate materials with labour and capital resources, in distinct processes of production or service delivery, is common to all projects. Technology is a basic component for a project whether the outputs are marketable or non-marketable goods or services.

FIGURE 13: PROJECT TECHNOLOGY



Essentially, the technology refers to "How" the project is to be done. Consideration must be given to the following*:

- (a) alternative ways of carrying out the project;
- (b) engineering or technical characteristics of each alternative;
- (c) corresponding physical and human resource requirements;
- (d) plans for or requirements for installation, operation, maintenance; and
- (e) criteria affecting technology selection.

Project technology by nature, involves technical specialists, such as engineers, education specialists, and so on. Studies of project technology usually cover the following:

- i) the production outputs--specifications;
- ii) the production processes;
- iii) characteristics of the means of production;
- iv) requirements of the project;
- v) location of the project;
- vi) size of the project; and
- vii) timing of development or phasing.²³

Elements in establishing the project technology and documenting this within the project plan include the following:²⁴

a. *Research and Testing*: Invariably the technology component requires a certain amount of preliminary testing and research to assist in making many of the decisions related to technology. These cover a wide variety of matters, such as site tests for construction, tests of raw materials or processes, tests of outputs, and so on.

* See Module 13 - Project Technology

- b. *Selection and Description of the Production Process:* There are usually a number of processes which could be adopted for production. They can be exemplified by a flow diagram in which the raw materials and intermediate materials become the project outputs. For example, how mangoes become tinned fruit juice or how illiterate adults become literate adults.
- c. *Selection and specification of facilities and equipment:* This involves selecting the specific types of facilities and equipment from the varieties available. Such decisions often involve trade-offs between costs and quality of machines or facilities based upon the general resources available to the project. It is necessary to examine equipment with respect to both that required for *implementation* (putting the project in place, such as construction equipment) and that for *operations*.
- d. *Site Layout:* Whether the facility is a factory, school, clinic or whatever its layout, is important to ensure maximum efficiency of use and potential of expansion. Operational efficiency is very dependent on plant layout as it promotes economy in movement, time, materials and a general ease throughout the production processes.
- f. *Additional Infrastructural Installations:* This includes the infrastructures which provide services required for actual production and for use by personnel on the project. Examples of these include drinking water, removal of residual water, power, fuel pipes, housing, administrative offices, and so on. These considerations arise out of the project technical requirements but depend upon the local conditions and the judgement of the project management. These are often supplemental to the basic technology choice, but can be critical to successful operations.
- g. *Plant Efficiency:* This refers to the output from the production processes in terms of operating and input costs, relative to productive capacity. The volumes of inputs according to physical processes employed, the quality of available raw materials, the experience of similar plants, in addition to purely technical factors, should be taken into account along with the general administrative and technical organization and the quality of labour available to use the technology.
- h. *Flexibility of Production Capacity:* The need for flexibility in productive capacity can be a major consideration. At times variations in production may be necessary as a result of the nature of demand, limitations of raw materials, or changes in the financial situation, and so on. Flexibility of productive capacity is important to facilitate growth and flexibility of operations with a minimum amount of difficulty and cost.

i. *Work schedules*: This refers to the order of activities for technology installation and entry into operation,. It must be synchronized with other aspects of the project such as procurement of materials, generating demand of clientele, training of personnel, etc.

There are several dimensions which will differ in the various technology alternatives. It is the task of the planner to examine all these dimensions and put together the best combination for meeting the project objectives within the scheduled time, cost and resource constraints. These dimension include:

- (a) the production processes;
- (b) size;
- (c) location;
- (d) input materials (supply, quality, accessibility);
- (e) output standards and volume;
- (f) timing and phasing;
- (g) scale and size of production;
- (h) capital - Labour combinations (technological level); and
- (i) mix of local and exogenous skills and technologies.

Alternative technology choices are also difficult because to be effective, assumptions must be made about concurrent changes such as:

- i) reforms in existing administration and regulations;
- ii) improvements in or expansion of the operations, efficiency, and coordination of existing facilities;
- iii) rationalization of some input, supply, or other types of project support;
- iv) modifications in plans of related organizational or productive structures;
- v) parallel capital investments to provide the necessary support;

- vi) characteristics of the means of production; and
- vii) requirements during the stages of implementation.²⁵

In addition, technology includes considerations for basic infra-structural or civil work requirements, buildings, transport network, storage system, water supply, drainage power supply, and any other special structures. All decisions on technology must integrate a broad range of data on many factors affecting a preferred technology, including:

- (a) labour;
- (b) special raw materials;
- (c) electrical power;
- (d) fuel;
- (e) water;
- (f) decentralization policies;
- (g) housing facilities;
- (h) minimum and maximum capacities, and so on.

Sound project technology results from careful analysis of both technology and the project area and its larger socio-economic setting. Before specific technical choices are made, there must be data to estimate desirability, to gain an understanding of their true potential impact, and to estimate the benefits and costs. Many development projects seek drastic changes in social behaviours in the technological processes. Design is an extremely complex process and is used to synthesize the recognition of the beneficiaries' real and perceived needs with appropriate technological choices.

Throughout the planning of a project, planners are faced with the possibilities of *alternatives* for each component--outputs, resources, scheduling, costs, organization and so on. But the concept of alternatives is particularly relevant to technology selection. Almost invariably there is more than one way of technically meeting the same project requirement. A major problem in planning to be avoided is to be limited too quickly to one approach, one process or one alternative. *The choice of alternatives is very important with regard to projects, as a limited approach often leads to an inflexible commitment which can be changed only with high costs or delays once the plan is fairly advanced or implementation has begun.*

There is much argument about "*levels*" of *technology* within the development context. There is small versus large technology, labour-intensive versus capital-intensive technology, and so on.²⁶ A challenge to the project planners is to avoid commitments based upon any particular bias in technology selection, but to find the appropriate technology for the project conditions and objectives. The issue is not simply one of technology bias, but whether the technology fits the social, economic, cultural, physical and development environment in which it is to be applied. For example, one aspect of "appropriateness" of technology is its competitiveness with other alternatives. It does no good to insist upon labour intensive technologies which force themselves out of the market because they do not produce competitively, have to be heavily subsidized, or are economically unproductive according to economic criteria. This is especially true in instances where economic circumstances place priority upon development projects which develop self-reliance and self-sufficiency, as well as for those in the competitive domestic or world markets.

"Appropriateness" of technology must be measured in relation to both the human and institutional capacities as well as the technical requirements and inputs. An appropriate pricing of production inputs as well as relative levels of sophistication in the environment must be considered. In this sense, appropriate technology is a relative concept - relative to the immediate processes, requirements and circumstances. Appropriateness cannot be measured as a single concept, but in relation to the various dimensions of technology.²⁷ The "appropriateness" of a technology must be judged in relation to:

- (a) appropriateness to project goals and higher development goals and policies;
- (b) appropriateness of the outputs (goods or services);
- (c) appropriateness in the economical use of available and accessible inputs setting;
- (d) appropriateness in consistency with the institutional and cultural setting; and
- (e) appropriateness to the desired changes to be brought about by the project.

A very important concept in the design and selection of appropriate technologies is that of *technological linkages*. It has forward and backward linkages which are important considerations in the choice of technology as well as overall project design. The project must receive materials and supplies--these constitute the *backward linkages* of the project. The outputs of the project must be used--these uses represent the *forward linkages*

of the project.²⁸ Backward linkages of a sugar-processing mill would include the transportation to the mill as well as the cane production units. The forward linkages would be represented by sugar refineries, bagasse board plants, and so on. Technological linkages of the project should be carefully considered as they often represent the basis for an effective installation of a selected technology.

The following gives a few illustrations of the types of decisions which must be made with respect to technology, though these vary widely with the types of projects. For example, the nature of goods and services may vary in terms of *quality* and yet still meet the basic defined needs. Roads of various quality can be constructed to hold a maximum or minimum capacity, leaving some room for exercising technological judgement on the quality and capacity. Educational programs can be designed to achieve a minimum acceptable level or to strive for excellence. Other types of decisions deal with *scope* and *phasing*. Production processes and resources bases may be increased over time and ideal capacities may be developed in earlier years or met through expansion in later years. Alternative *sizes* and *locations* are often critical decisions as well as the capacity. When there is a geographical distribution of needs or of supplies, there is a tradeoff between location of supplies and the market. The decisions will be based upon the nature of the product and relative transportation cost. In general, it is better to minimize the transport costs of inputs (which are usually heavier and more vulnerable to damage) than the costs of transporting outputs. Another area of decision is in relation to *economy of scale* which tend to encourage larger plants, though the gain may be offset by higher distribution costs. Technological decisions involve issues such as installed capacities, structural features, maintenance requirements, provisions for flexibilities, fit to labour characteristics of the raw materials, manner of operation, and so on. There is much experience--successful and unsuccessful--in technology selection, but it is not often transferent to new projects. In advanced stages of planning a project, however, it is usually necessary to conduct a technology study. There are limits to the transferability of technological experiences between projects.

8.4 *Products and Techniques*

The products associated with this component include the following, though this will vary greatly between types of projects:

- (a) an overview of the "technology";
- (b) physical and infrastructural requirements;
- (c) outputs specifications;

- (d) location analysis;
- (e) plant and site layouts;
- (f) equipment and supplies requirements;
- (g) input materials requirements;
- (h) description of the production process; and
- (i) organizational and management requirements.

There should also be a discussion and description of any additional or supporting changes or structures necessary for the installation and operations of the technology, such as highway linkages, administrative capacities, regulations, etc. The techniques associated with the technology will be generally those associated with the professions involved--from architects and construction managers to educational or health delivery specialists or agriculturalists, and so on.

8.5 *Relevant Modules*

- Module 1 - Project Objectives
- Module 2 - Logical Framework
- Module 5 - Project Organization
- Module 11 - Resource Plans/Manpower Plans
- Module 13 - Project Technology Analysis
- Module 14 - Demand Analysis
- Module 15 - Market Analysis
- Module 16 - Project Area Analysis
- Module 17 - Project Costs and Benefits
- Module 31 - Environmental Analysis and Institution Building.

IX. COMPONENT FIVE: PROJECT RESOURCES

1 Problem or Need	2 Objectives and Outputs	3 Demand and Market
8 Costs and Benefits	9 Project Summary	4 Technology
7 Project Life and Schedule	6 Organisation and Management	5 Human and Physical Resources

9.1 Purpose:

The purpose of this component is to ensure that all the *human and physical resources* required for carrying out the project are identified and can be made available to the project. This requires special attention to raw materials including land and water necessary for the project implementation or operations. It is also necessary to specify areas of technical or professional expertise as there may be scarcities, in the development context, which necessitate the procurement of technical assistance for project execution.

9.2 Relation to other Components

The component is directly derived from the Technology Selection Studies. Resource requirements are inherent in the choice of technology. If the resources are unavailable, modifications are often necessary in the project technology.

The identification of physical and human resource requirements is followed by an identification of *sources*. This becomes the foundation for Project Organisation . Costs and scheduling are naturally based on the availability of resources required for the project and are dependent upon the sources of the resources.

9.3 *Development a Resources Statement*

The choice of technology is the primary determinant for estimations of resource requirements. Project inputs must be identified with special attention to those required inputs which may be in scarce supply. The planners must estimate requirements in four basic categories:

- (a) manpower;
- (b) raw materials;
- (c) supplies and intermediate materials; and
- (d) equipment and facilities.

Raw Material supply is a critical issue in determining level of production in those products generating products or goods, so it will relate closely to project size and technology selection. In some instances, the identification of unutilized or underutilized raw materials may have been the basis for the original project idea, e.g., idle land, spoiling fruits, and so on. The supply of raw materials can be the "*opportunity*" for the project, or can be a major "*constraint*" which forms the boundaries for levels of productivity. Raw materials must be examined both in terms of quantity, availability, accessibility, and quality. Quality standards are very important factors meeting specifications for outputs, technology, or production processes.

The project capacity is also greatly influenced by the availability of other critical resources, such as *supplies, intermediate materials and commodities*. Water, electricity and related utility requirements may be serious constraints to the success of many projects and should be studied. Other constraints may come from commodities or supplies required as intermediate inputs, such as fuel, paper products, plastic components, and so on. It may be found that these constraints may show that the project will have to be reduced below the maximum capacity to meet the demand for its output.

Equipment requirements of projects can be a significant constraint in project design. Construction activities, for example, may make demands upon equipment which are not entirely controlled by the project but must be shared

throughout the sponsoring organization where there is an excessive demand which limits use on the project. Equipment, if critical to project production, must be identified so that procurement can be initiated and to ensure it is consistent with site/buildings plans before the undertaking of other supportive project activities, such as construction or design of the buildings and other site facilities for equipment.

Manpower is another basic category of resources which must be closely examined during the planning stages. All classifications of skills required on the project should be identified, from attendant and labourer to the higher professional or technical categories. Human resources can be examined in terms of *capability* and *capacity*. *Capability* refers to the existence of the skills technician or professionals. *Capacity* refers to the load which can be carried. The distinction is necessary because it is often possible to identify persons with the necessary knowledge, skills or experience, but these persons are already overworked. In this case, there is a capability, but *not* a capacity.

Successful completion of projects is often a direct result of the recruitment of appropriate human resources to meet the manpower demands of the project. Special attention must be given to any skills which may be difficult to obtain. It may be necessary to include a training component into the project plan to ensure that there is sufficient time to prepare persons for project implementation or operation. If gaps are identified, it is often possible to identify domestic and international sources of technical assistance. In later stages of planning, care should be taken to ensure that personnel identified for the project do not merely exist on paper, but are actually available. Frequently, persons are identified, but are not able to work on projects because of other work assignments or restricting personnel arrangements.

At the Project Profile Stage, however, it is sufficient to identify only the classifications of resources required (and the specifications) as a basis for making the first judgements about the project personnel requirements. At the later stages, it is a must to go beyond the mere identification of resource requirements of types and general quantity needs. Intensive investigations must be made into the actual resources in all categories with careful documentation as to the qualities, locations and any constraints on the uses of the resources. When the relevant types of resources in each category are compiled into a list, the level, quality and quantity of each resource required for the project would be identified, in relation to the existing qualities and quantities available to the project.

The *Resources List* identify any of the resources in scarce supply. This will enable the team to forecast whether or not the requirements throughout the life of the project can be met. Types of resources additional or alternative to those identified may be proposed as contingencies and their substitution effect on project design calculated among considerations of alternatives.

Resources surveys and estimates should focus on both those requirements for project implementation and for operations. Frequently the emphasis on implementation is so heavy that operational requirements are neglected, to the detriment of the overall impact of the project. Projects may require an increased budget due to additional personnel, supplies, and materials when they are terminated into operations. These recurrent consequences of projects should be identified from the earliest planning stages.

Estimates of resources for the project should include identification of areas in which the utilization of the resources for the project may adversely affect supporting organizational activities. The drawing of some resources, e.g., manpower, to a project, may detract from their performance of tasks in other programmes or activities which are critical to the overall impact of the project. An example is when the accounting department is unable to function to full capacity on routine activities because some key persons are assigned to project work. Both the project and the ongoing programmes may suffer. This is also true of administrative resources, equipment resources, training resources, maintenance resources and other resources which may come to the project at a trade-off in relation to performance of normal activities, or functions. General areas in which resources should be examined include institutions which provide the organizational and operational structures in the project setting, organizations providing project inputs and services, institutions providing financing or financial assistance, administrative machinery necessary to implement the project and ensure its continued impact, and use of expatriate technical assistance on projects.

Resource estimation can be relatively simple at the stage of the Project Profile, but should be very detailed and extensive, expanding quite beyond the immediate or obvious project boundaries into supporting capabilities of the environmental organizations, at the more advanced stages of project planning.

9.4 *Techniques and Products*

The products of this component include the following:

- (a) list of all material resource inputs identifying quantity, quality and accessibility;
- (b) list of all human resource requirements for the project identifying qualifications;
- (c) list of areas in which material or human resource scarcities or problem may exist;
- (d) strategies for overcoming resource obstacles to project implementation; and

- (e) projection of effect of use of resources for the project on performance of routine activities.

To complete this documentation, technical familiarity with resources and information on quality tests performed upon the material resources may be necessary. In addition, it is important to be familiar with personnel practices and procedures in the project setting to provide guidelines for job descriptions, technical assistance guidelines and other documentation necessary to personnel acquisition and assignment.

9.5 *Relevant Modules*

- Module 11 - Manpower Plans/Resource Plans
- Module 13 - Project Technology
- Module 17 - Project Costs and Benefits
- Module 32 - Environmental Analysis and Institution Building Model
- Module 39 - Pre-Feasibility and Feasibility Study Formats.

X. COMPONENT SIX: ORGANISATION

1 Problem or Need	2 Objectives and Outputs	3 Demand and Market
8 Costs and Benefits	9 Project Summary	4 Technology
7 Project Life and Schedule	6 Organisation and Management	5 Human and Physical Resources

10.1 Purpose:

The purpose of this component is to establish the temporary organisational structures required to carry out the project. This includes mobilising all physical and human resources, establishing the implementation and production processes, and satisfactorily delivering the goods and services. Organisational structures clarify the diverse authorities, responsibilities and relationships which are characteristic of cross-departmental, inter-agency projects. Dispersed organisational resources must be brought together using appropriate coordinating mechanisms into an integrated unit for the life of the project.

10.2 Relation to other Components:

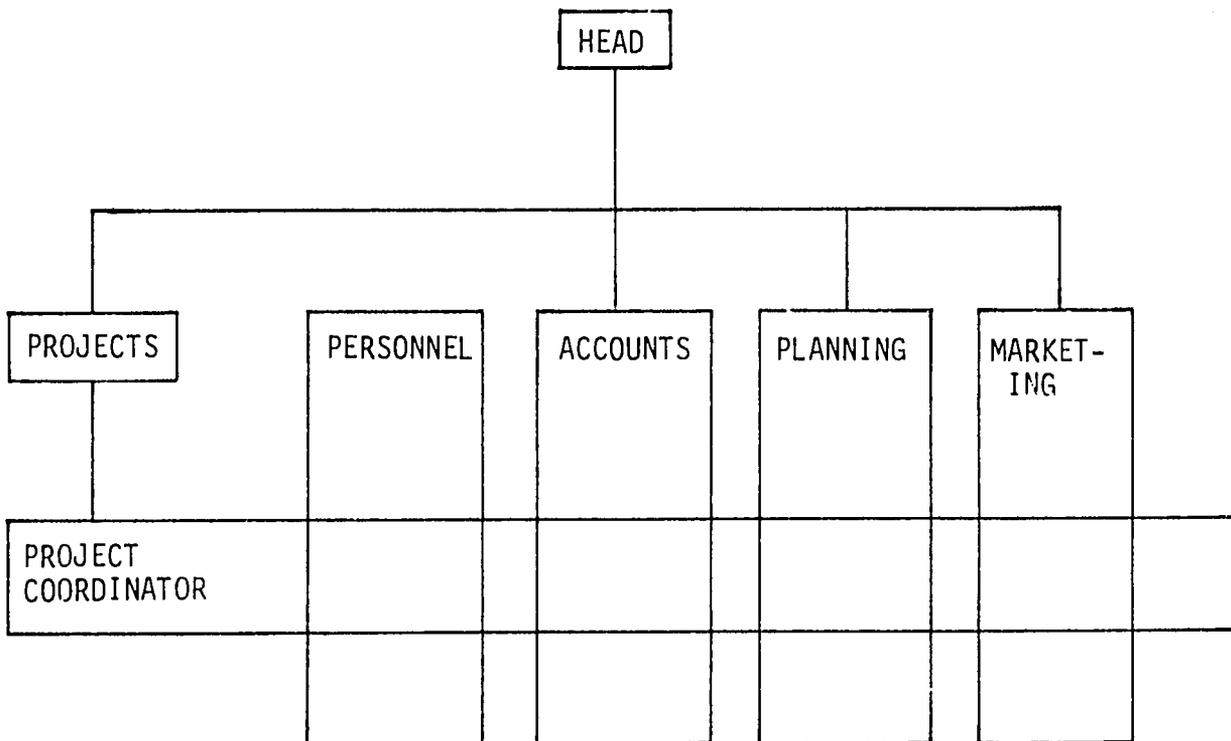
Although the organisational setting of a project is generally evident from the conception of the project idea, the project organisational structures which must be established are dependent upon the selection of technology. Sources of project resources, as well as the total range of project activities, determine the scope and structure of the project organisation. As the organisation is established, it will be possible to begin refining the costs involved in establishing the project.

10.3 *Developing a Project Organization Statement*

The success of a project depends largely, apart from its technical and economic merits, on the organization of the persons responsible for its implementation and operation. Without effective and efficient organization, an otherwise sound and viable project may end in failure or disappointment.²⁹

The form of organization appropriate for a project depends upon the nature of the project, the scope of project activities, the characteristics and requirements of the sponsoring organizations, and the nature of the responsibilities to be performed*. A project may be defined as part of the existing organizational structures and be performed entirely along with the routine responsibilities of the assigned officers. (SEE FIGURE 14).

FIGURE 14. The Matrix Organizational Structure



It may also be made into a completely distinct new organisation with full responsibility for all aspects of project organisation and management. There is a continuum between the two extremes ranging from a Part-Time Project Manager to a Full-Time Project Manager with Part-Time Staff to a full project team within the existing sponsoring agency. This range of organisational options, called Matrix Management is shown in FIGURE 15. The choice of organisational structure will be affected by such project characteristics as urgency, size, scope, complexity, duration, risk, and so on. Project organisation also depends upon the strengths of the sponsoring organisation(s) and the forms of cooperation necessary to carry out the project.³⁰

FIGURE 15: THE RANGE OF ORGANISATIONAL DESIGNS

Type of Organisation:	1	2						3	
	Functional	Matrix						Projectised	
		a	b	c	d	e	f		
Purely Functional Organisation		Project Manager:						Full Project Team	New Project Organisation
		P.T.	P.T.	F.T.	F.T.	F.T.			
		Staff:							
		-	P.T.	P.T.	P.T. + F.T.	F.T. + P.T. professionals.			

P.T. = Part-Time F.T. = Full-Time

A distinction must be made between the *project organisation* and the "parent" *organisation* which is responsible for the project. The former refers to the organisation of those persons contributing directly to the project and the latter to the organisation(s) in which the project is housed. It is important to clarify those responsibilities which lie with the project organisation as opposed to those with the parent organisation. The project organisation is generally entrusted with day-to-day decisions affecting execution, internal and external coordination and general project supervision. Officials in the parent organisation have the continuous responsibility of general policy direction and review of overall project progress.

When planning the project organisation, it is first necessary to review the structures of the parent organisation and all contributing organisations, including the relevant sections of funding agencies. Existing *organisational charts* should be reviewed and adapted to incorporate the project. These should be supplemented with functional descriptions for all related units. *Functional descriptions* define the authorities, responsibilities, and characteristics of the units involved. These characteristics include such things as degrees of decentralisation or integration (i.e., amount of authority vested in lower levels or peripheral units and generalisation versus specialisation within operational units). If possible, it is useful to identify any known informal aspects of the organisations which will influence project implementation, such as the influence of key persons.

A review of the routine administrative procedures of the relevant units is an important part of advance planning for the project. This is obviously necessary as a project nears authorisation and the plans for implementation are being considered. For example, the administrative procedures to be reviewed include, those procedures followed when:

- (a) submitting proposals for planning approval;
- (b) budgeting (preparation, submission, review, adjustment, approval and allotment);
- (c) making staff assignments, including post establishment, staff recruitment, selection and assignment;
- (d) administering the training programmes for staff to be on the project;
- (e) administering aspects of facility construction (design, site selection, tendering, supervision, etc.);
- (f) administering processes for the supplying system (requisitioning, stock-keeping distribution);

- (g) preparing required reports; and
- (h) requesting and administering foreign technical assistance.

These processes may already be documented in manuals and official circulars which should be collected and put into the Project File for ready reference. The review should include time estimates for the various key administrative processes so this information can be included in scheduling for the project.

As projects are temporary and often involve unique constellations of organisations who cooperate, it is necessary to review the decision making processes in all the various cooperating organisations or units and then design a project decision making system which incorporates all relevant decision processes. It is important to know how decisions will be made relative to such matters as:

- technical matters on the project;
- funding and expenditure;
- managerial issues of implementation;
- project modification;
- project staffing;
- personnel performance and supervision; and
- evaluation.

For each of the types of decisions identified, the organisational level(s) involved should be identified as well as the position of the decision maker. This should be summarized in the form of a report which has three supplements: (a) a schedule of decision events, (b) flow diagrams illustrating each decision where, by whom and when taken, and (c) the new structures needed to facilitate integration of planning and decision making.

Recommendations must be made for the staffing of the project. This will include key managerial staff, technical and administrative personnel, and other support personnel. The measures necessary to fulfill the requirements for training may also be identified, depending upon the needs of the project. The project organisation may change during implementation and after termination into a programme or routine operations. These changes should be reflected in the organisational plans made for the project, including organisation charts and brief descriptions of the positions required, including those for which foreign or domestic technical assistance may be required.

A review of the *implementation experience* of the relevant organisational units should also be conducted to identify strengths and weaknesses in carrying out projects. It is important to get information about the organisation of project teams, the control of the projects, the kinds of problems encountered and how they were resolved. This will give guidance in the types of organisational forms which will be required to help ensure successful project implementation.

The organisational review should end with planning documents which include relevant organisational charts, brief functional descriptions for relevant organisational units, Linear Responsibility Charts, and notes on informal relationships or organisational adaptabilities (i.e., judgements of the capability, and willingness of each relevant unit to adapt its structures and functions to meet the demands of the project).

Project planners need to have an understanding of the *institutional environment* of a project. It is very complex. There are suppliers, regulators, beneficiaries, political interests, competitors, donors, contributing agencies, and so on. A useful framework for understanding the institutional environment is the Institution Building Model (See FIGURE 15) which identifies four major types of linkages with the environment: 31

Functional linkages which primarily supply inputs or receive the outputs of the project, thus enabling it to work successfully.

Enabling linkages which provide the general authoritative and regulatory support necessary for the project.

Normative linkages which exist with groups or organisations having similar or supporting norms, objectives (or directly opposing ones) and can thus have an impact upon project performances.

Diffuse linkages which are influential, but less direct and organised, such as with media, volunteer groups such as parents or youth, etc.*

Planners need to identify the primary linkages of the product in each of these areas, and in the advanced stages of planning, seek to ensure that the linkages support the project, either through modes of participation or inclusion which permit appropriate influence of key linkage holders on project design, especially on the design of the project organisation.

* See Module 32 - Environmental Analysis and Institution-Building Model.

Within each of the contributing organisations, it is also useful to review relevant policies which may have an influence on the project, such as:

- national development or sector plans;
- constitutional functions and responsibilities;
- descriptions of ministerial functions and interrelationships;
and
- international agreements, programmes and goals.

The list of relevant policies affecting the project should be collected. This can become a powerful tool in justifying the project, especially if the policies lead support to the project ideas. In addition, it is useful to review all related programmes to see if there may be any contribution to or cooperation with these programmes to the benefit of both the project and the programmes. This review seeks to ensure a higher level of coordination between the project and its larger environment.

10.4 *Products and Techniques*

The products of this step include:

- (a) recommendations for the project organisation needed to implement the project;
- (b) recommendations for the project organisation needed to operate the project;
- (c) recommendations for the organisational location of the project;
- (d) graphic and functional descriptions for the project organisation;
- (e) graphic and functional descriptions of key organisations in the project environment;
- (f) graphic and functional descriptions of the decision-making processes for the project;
- (g) summary of important policies, programmes and regulations which may impact or influence the project.

The organising of a project requires sound understanding of the alternatives for project management either as routine operations in an existing organisation or project matrix management or a new unique organisation. It requires an understanding of organisational procedures and regulations, so that these can be adapted to project needs and so that project schedules can reflect the time requirements of administrative processes.

10.5 *Relevant Modules:*

- Module 5 - Project Organisation Charts
- Module 6 - Linear Responsibility Charts
- Module 13 - Project Technology Analysis
- Module 14 - Demand Analysis
- Module 15 - Market Analysis
- Module 16 - Project Area Analysis
- Module 32 - Environmental Analysis and Institution Building Model
- Module 33 - Ecological Analysis.

XI. COMPONENT SEVEN: SCHEDULING

<p>1 Problem or Need</p>	<p>2 Objectives and Outputs</p>	<p>3 Demand and Market</p>
<p>8 Costs and Benefits</p>	<p>9 Project Summary</p>	<p>4 Technology</p>
<p>7 Project Life and Schedule</p>	<p>6 Organisation and Management</p>	<p>5 Human and Physical Resources</p>

11.1 Purpose:

The purpose of this component is to place all the project activities into a time frame which shows their logical work relationship throughout the project implementation stage. The project schedule phases the activities so they can be controlled and interrelated to meet precedence and follow-up requirements and to ensure that performance of the various elements and activities of the project are integrated.

11.2 Relation to other Components:

Project Schedules are dependent upon the identification of project technology, resources, and organisation. From these components, it will be possible to identify all of the project activities and to know what "phasing" is necessary based upon available resources to complete the project. The scheduling also shows the phasing of costs and benefits throughout the life of the project. It generates information which leads into the project component on costs and benefits.

11.3 Developing a Project Schedule:

Projects are generally "once through" or "non-repetitive" processes. They are sets of activities to achieve a specific set of objectives within established time and resource constraints. Scheduling is therefore important to define and integrate the necessary events on a timely basis of accomplishment, to ensure successful fulfillment of the project objectives. *Scheduling* can be defined as the specification of times for key project activities (and dates, as the plan is finalised). Scheduling consists of identifying project activities, planning activity durations, and integrating and coordinating the activities into a project schedule. This will define the timing of the total project as well as areas or effort whereby trade-offs in time, resources and performance will enable project management to meet scheduled dates; but for the planning stages it primarily shows the relationship between the activities, the total project life, and the resource needs of the project over time.

Project scheduling must begin with a Work Breakdown Structure detailing the activities of the project*. At the early stages of planning, it may be necessary to identify only the major project elements, but at advanced planning stages, the Work Breakdown Structure should be as detailed as possible to assure more accuracy and precision in the plans. (SEE FIGURE 16).

Several techniques are available for diagramming project schedules. For simple schedules (as in the Profile Paper), a Gantt Chart will be sufficient**. (SEE FIGURE 18). But in later stages, it is usually advisable to initially prepare either a Precedence Diagram*** or PERT Network as a foundation for the Gantt or Bar Chart. The Bar Chart has a time scale horizontally across the top of the chart (e.g., days, weeks, months) and project activities are listed vertically on the left hand side of the chart. Bars or lines are used to indicate the time within the schedule for each activity. Dependency can be shown on bar charts, but not as easily as on the network diagrams. An advantage of bar charts is that they are easier to read -- and as flexible as the network diagrams.³²

The network diagrams, PDM or PERT, represent project activities in terms of interrelationships. These are diagrammatically displayed in terms of logical work precedence with a diagram or arrows. In the advanced stages of planning, milestone events will also be identified as the points of significant accomplishment of key activities or decisions. On most projects, network diagrams are transformed into a Bar Chart for project implementation and monitoring purposes. See illustration 17 for an example of a PDM activities network.

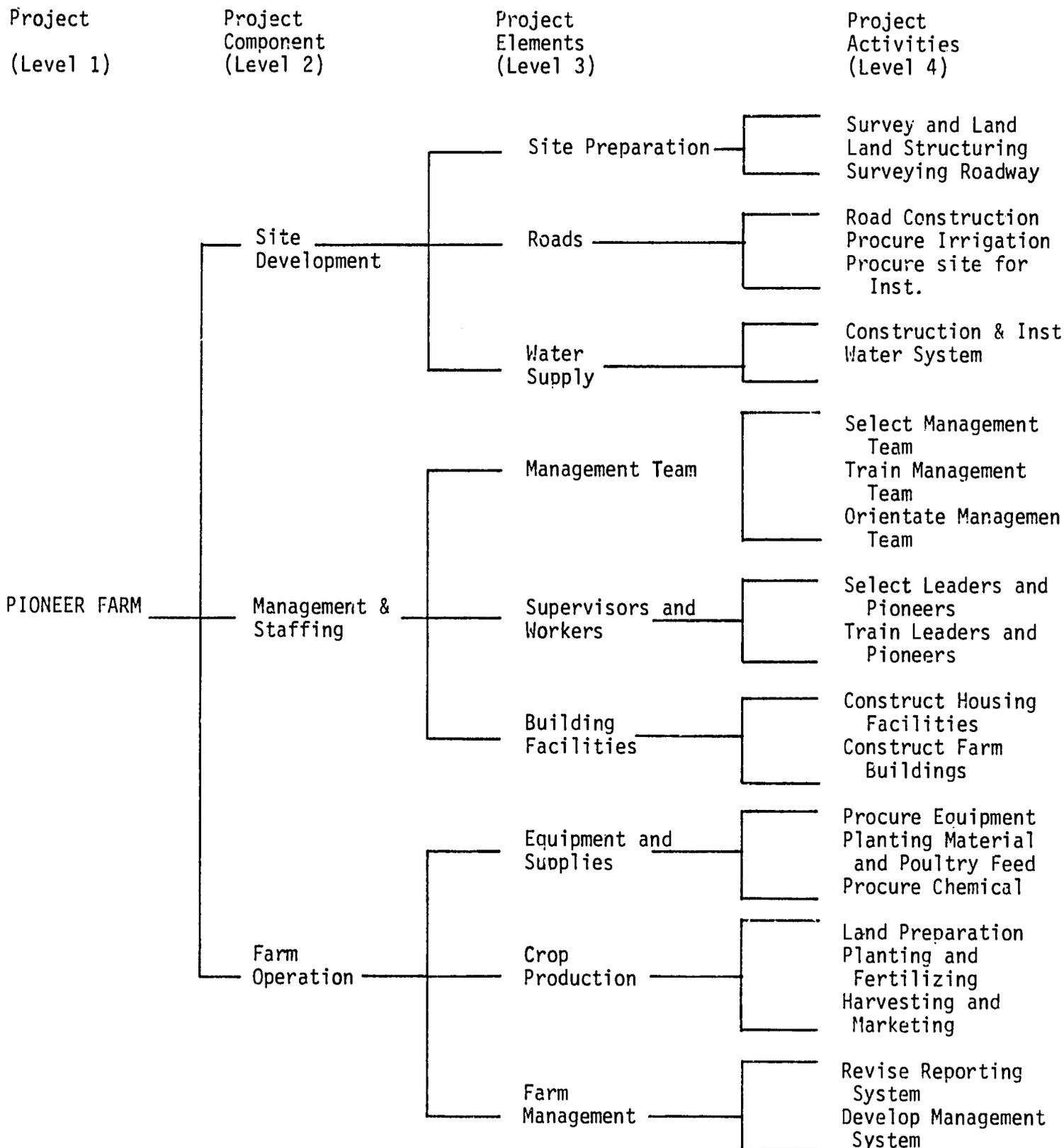
* See Module 3 - Work Breakdown Structure

** See Module 7 - Project Scheduling - Bar Charts

*** See Module 9 - Project Scheduling - Network Analysis.

FIGURE 16

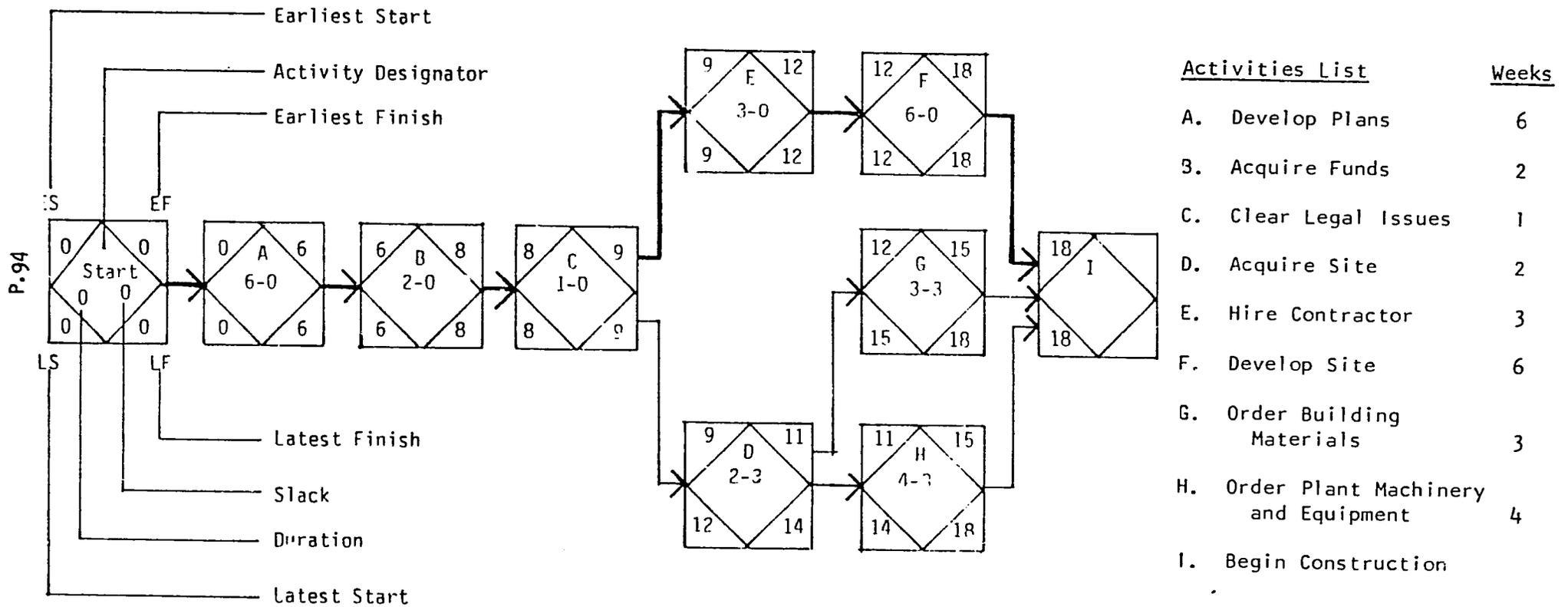
MODEL OF A WORK BREAKDOWN STRUCTURE FOR A PIONEER FARM



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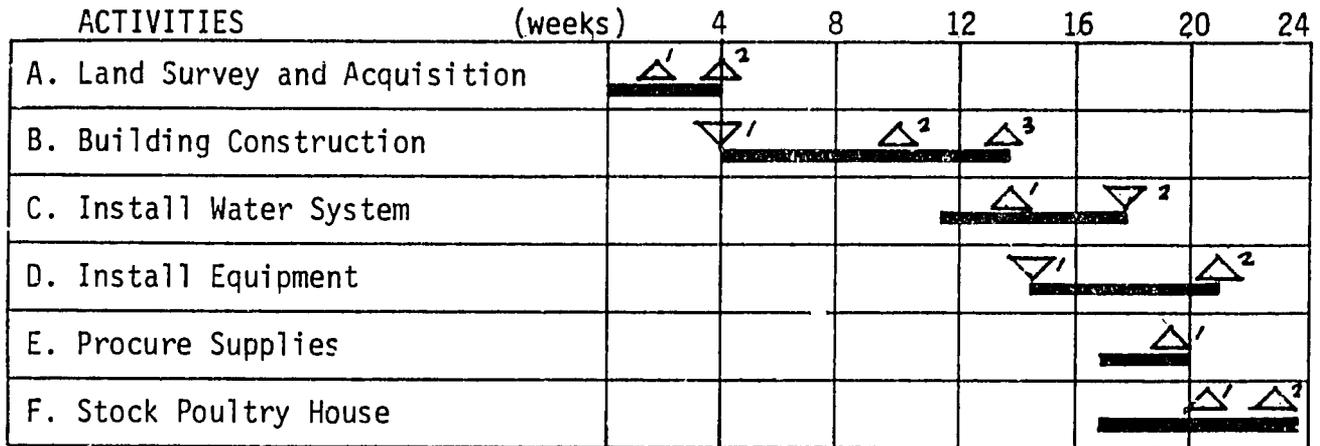
ILLUSTRATION.2

AN EXAMPLE OF PDM NETWORK SCHEDULING FOR BUILDING A SMALL MANUFACTURING PLANT



CRITICAL PATH

FIGURE 18: BAR CHART AND LIST OF MILESTONES⁴⁵
SIMPLIFIED BAR CHART FOR POULTRY PROJECT



LIST OF MILESTONES

		Planned date (end of week)	Actual date
A - 1	Land Survey Completed	2	
A - 2	Land Transfer Completed	4	
B - 1	Building Plans Approved/with Permit	4	
B - 2	Foundation and Exterior Completed	10	
B - 3	Building Interior Completed and Inspected	14	
C - 1	Exterior Water Systems Installed	13	
C - 2	Interior Water Systems Installed	18	
D - 1	Equipment moved to Site	17	
D - 2	Equipment Installed and Tested	21	
E - 1	Supplies Inventory Completed	20	
F - 1	Delivery of First Set of Poultry	21	
F - 2	Poultry Stock Inventory Completed	24	

Effort is required in the preparation of the project schedule for realistic planning. The schedule should incorporate *work logic* (logical precedence); *time logic* (float times, etc.); and *resource logic* (adjustment). A common mistake in planning is to have work logic illustrated, but to not plan the actually available resources. Often projects take much longer than planned because it was assumed that there would be resources (especially human) available to do the job as originally planned. The over-run in time may cause a further lack of resources and thereby create serious implementation problems.

11.4 *Techniques and Products:*

The products of this component include:

- (a) work breakdown structure;
- (b) precedence diagrams; and
- (c) master project schedule.

11.5 *Relevant Training Modules:*

- Module 3 - Work Breakdown Structure
- Module 4 - Activity Description Sheets
- Module 7 - Project Scheduling - Bar Charts
- Module 8 - Using Bar Charts for Project Control
- Module 9 - Project Scheduling - Network Analysis
- Module 10 - Milestone Status Charts
- Module 11 - Manpower Plans/Resource Plans
- Module 17 - Project Costs and Benefits.

XII. COMPONENT EIGHT: PROJECT COSTS AND BENEFITS

1 Problem or Need	2 Objectives and Outputs	3 Demand and Market
8 Costs and Benefits	9 Project Summary	4 Technology
7 Project Life and Schedule	6 Organisation and Management	5 Human and Physical Resources

12.1 Purpose:

The purpose of this component is to identify and phase all the costs and benefits of the project over the life of the project. This permits an analysis of the financial and economic worthiness of the project and provides estimates of investment requirements and recurrent expenditures relevant to organisational and governmental financial planning. Cash flows will be established for both "commercial" projects and "non-commercial" projects so that the financing requirements are identified and financing sources can be sought. In addition, it is necessary to show indirect costs and benefits at advanced stages of planning to assist in a more thorough examination of the total "value" of the project to the society and the economy.

12.2 Relation to other Components:

The data required for financial analysis comes primarily from the Demand Statements (direct revenues or benefits) and the Technology Statement (Investment and Operational costs). These are supplemented by the Resource Requirements and Project Organisation which shows the sources of investment finances and supplementary financing as well as resources. Project

FIGURE 19: CASH FLOW STATEMENT (\$J 000's)

YEARS	PAMCO, PDRT Resource Material									
	1	2	3	4	5	6	7	8	9	10
SOURCES:										
Revenues	2.8	14.7	321.9	1478.4	2343.9	2400.1	2400.1	2400.1	2400.1	2400.1
Debt (Loan)	156	281	500	600						
Total Sources	158.8	295.7	821.9	2078.4	2343.9	2400.1	2400.1	2400.1	2400.1	2400.1
APPLICATIONS:										
Capital Expenditures	712.3	965.2	1279.6	1538.1	615.5	242.8	242.8	242.8	242.8	242.8
Operating Costs	6.5	49.7	109.1	173.4	185.8	202.9	205.7	205.7	205.7	205.7
Total Applications	718.8	1014.9	1388.7	1711.5	801.3	445.7	448.5	448.5	448.5	448.5
CASH FLOW:										
Net Cash Flow Before Debt Service	(-560.0)	(-719.2)	(-566.8)	366.9	1542.6	1954.4	1951.6	1951.6	1951.6	1951.6
Cumulative Cash Flow	(-560)	(-1279.2)	(-1846.0)	(-1479.1)	63.5	2017.9	3969.5	5921.1	7872.7	9824.3
DEBT SERVICE:										
Loan Repayment		35.8	100.3	215.1	352.9	352.9	352.9	317.1	252.6	137.8
Net Cash Flow After Debt Service	(-560)	(-755)	(-667.1)	151.8	1189.7	1601.5	1598.7	1634.5	1699.0	1813.8
Cumulative Net Cash Flow	(-560)	(-1315)	(-1982.1)	(1830.3)	(-640.6)	(960.9)	2559.6	4194.1	5893.1	7706.9

1.50

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FIGURE 20: NET INVESTMENT & FINANCING (J\$000's)

YEAR	1	2	3	4	5	6	TOTAL
INVESTMENT REQUIRED:							
Capital Expenditure	712.3	965.2	1279.6	1538.1			5353.5
Operating Costs	6.5	49.7	109.1	173.4			727.4
Debt Servicing	-	35.8	100.3	215.1	352.9	352.9	1057.0
Total Investment Period Costs	718.8	1050.7	1489.0	1926.6	1154.2	798.6	7137.9
DEDUCT:							
Gross Revenues	2.8	14.7	321.9	1478.4	2343.9	2400.1	6561.8
NET INVESTMENT	(716.0)	(1036.0)	(1167.1)	(448.2)			3367.3
PLANNED SURPLUS				151.8*	1189.7	1601.5	2943.0
FINANCING REQUIRED SOURCES:							
Long Term Loan	156	281	500	600			1537
Other financing, such as Government support or loans	560	755.0	667.1				1982.1
Total Financing	716	1036.0	1167.1	600			3519.1

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* Unearned surplus during Investment Period

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Scheduling, of course, provides the phasing of costs and benefits throughout the life of the project.

12.5 *Developing Costs and Benefits Statements:*

Project costs consist of all expenditures on goods and services required for all phases of the project -- both investment for implementation, and operations, as appropriate. Project costs and benefits are a major indicator of project worthiness in project analysis and should be based upon the data which has been generated in all the preceding components of project planning. The estimates of costs are expected to become very precise as a project matures through the planning stages. The Project Profile has general ranges of expenditures (and returns), while the Feasibility Study is expected to provide very accurate estimates.

Costs can be grouped in different ways. A conventional approach is to group costs in two groups: *capital costs* and *recurrent costs*. The *capital costs* are primarily incurred during the implementation phase and are the *investments* from which project benefits are to accrue. *Recurrent costs* are associated with *project operations* (following termination of the implementation phase), when the project reverts to routine management. Capital costs generally refer to all expenditures on preparation and installations, before operation, of the physical assets needed for the project. Recurrent costs are those required for operation and maintenance of the project. Recurrent costs are calculated on an annual basis and cover such items as salaries and wages, costs of essential inputs for an established production level, overhead expenses such as maintenance, administration, and so on. Capital expenditures (also called fixed investments) may include such items such as land, buildings, equipment, machinery, construction and installations costs, etc.³³

In the early stages of planning, the quantity and cost estimates, can be aggregated in general categories of expenditure for the project and are usually based upon historical cost records. This is to give an "order of magnitude" for project costs. Later planning should be more precise and should reflect only predictable cost increases during the implementation period.

The Project Profile format has three basic financial components -- Project Capital Costs, Project Operating or Recurrent Costs, and Project Revenues*. These can be combined into the cash flow for the project. The cash flow expresses the financial requirements and balances on an annual basis over the life of the project. A cash flow format is also attached to the Project Profile. Although cash flows may take several forms, there are commonly two basic categories -- *cash payments* which are considered as costs and *cash receipts* which are considered as benefits. Annual cash flows are necessary to determine the magnitude of expected cash deficits during the

* See Module 18 - Project Profile Preparation

investment or construction and development phases of the project because short, medium and long-term financing must be available. Cash flows also show the surpluses or deficits which will be incurred through the project life so that repayment can be arranged. (See FIGURE 19). The investment requirements are summarised, as in the Project Profile on a Summary Investment Sheet which will show probable or selected sources for the financing requirements. (See FIGURE 20).

Apart from expressing the financial liquidity, the project cash flow statement is basically used for calculating the various indicators of financial and economic worthiness. Project beneficiaries normally justify projects with the cash flow, except when more sophisticated forms of analysis are necessary to show the economic as well as the financial benefits of a project. So a cash flow is the basic justifier of the project, both in terms of overall returns and phasing of the returns. Even in projects where there are no expectations of financial surplus, the cash flow indicates the effectiveness or efficiency of the project. This is very critical because capital, especially foreign exchange, is considered one of the basic scarce resource in most developing nations.

Resource capital is scarce. It is necessary to show recurrent and capital costs broken into local and foreign currency requirements. This facilitates the seeking of financing arrangements and lays the groundwork for making an economic analysis which adjusts the values of foreign and local capital. The estimation of foreign costs always raises difficulties. Financing agencies may have regulations regarding the foreign exchange components which cause a tendency to raise this aspect of the project to a high proportional level. Such tendencies should be discouraged where balance of payments is under severe pressure. *Exchange rates used for foreign exchange should be realistic.* When a project is analysed, they may be adjusted to portray the economic situation.

The financial statements of the project, Cash Flow and Investment Summary particularly, present a clear picture of project financing requirements. The investment or implementation phase is of immediate interest to decision makers and financing agencies. In later planning stages, not only the extent of funding, but also the terms of reference for financing and methods of repayment should be detailed, or presented under specified assumptions. The financial component should show both the internal and external sources of project financing, and the policy and procedural problems that may be involved, particularly with regard to any relationship between scheduling of receipts, payments of domestic and foreign funds, and the phasing of project costs and benefits.

Financing constitutes a critical link between ideas and action. It is often necessary to obtain financing for Pre-Investment Studies as well as for project implementation. The problem of financing is not only that of securing the total investment requirements of a project but also, and equally important, ensuring that the funds are available, when and as needed. Otherwise costly delays may occur.

The Project Profile should indicate the volumes and schedules of investment requirements in a crude set of estimations over the life of the project. If financing is required for subsequent planning, this should be indicated with some accuracy and prospective sources of such financing should be proposed.

In proposing financing for advanced planning stages, sources for financing should be identified, together with relatively accurate amounts and schedules. Sources of funds may be broadly classified as internal or external (i.e., to the operating Agency or Ministry). They may also be broken down into foreign and domestic sources or into governmental or private sources. If a project can be primarily financed from within an agency, it will not be generally essential to follow the planning stages required for projects which demand special or capital budgeting. The following general sources of financing might be indicated in the Project Profile, but should be specified in detail in more advanced planning stages:

- i) Internal to the Agency:
 - (a) agency's income; and
 - (b) depreciation reserves.
- ii) External to the Agency:
 - (a) capital contributions (e.g., stocks);
 - (b) Locals (domestic and foreign).
 - Corporate bonds,
 - Government bonds,
 - Borrowing from investment/financing institutions, and
 - Borrowing from foreign government assistance programmes.
- iii) Other special financing arrangements:
 - (a) general revenues;
 - (b) special funds; and
 - (c) grants.

A clear justification must be presented for proposals to tap each of the identified financing sources. If appropriate, proposed terms and conditions of credit should be stipulated. Traditionally, for example, only direct and indirect foreign currency costs of projects are eligible for loan financing by foreign institutions.

12.4 *Products and Techniques:*

This component results in the following products or planning documents, with varying degrees of accuracy depending upon the stage of planning the project has reached:

- (a) capital investment costs (foreign and local);
- (b) recurrent or operating costs (foreign and local);
- (c) anticipated revenues;
- (d) cash flow statement;
- (e) investment summary;
- (f) financing requirements;
- (g) possible financing sources; and
- (h) relevant regulations or requirements attached to sources or uses of funds.

The techniques associated with these documents include accounting, pricing and cash flow analysis. Planners are also at an advantage if familiar with the various techniques of financial and economic analysis. These include Discounting, Cost-Benefit Analysis, Net Present Value, Internal Rate of Return, and so on. But planners must avoid the danger of making the project appear more attractive than it actually is by adjusting any key factors affecting the financial measures used as indicators of project worthiness.

12.5 *Relevant Modules:*

- Module 17 - Project Costs and Benefits
- Module 19 - Financial Analysis
- Module 20 - Cash Flow Analysis

- Module 21 - Discounting
- Module 22 - Net Present Worth
- Module 23 - Cost-Benefit Analysis
- Module 24 - Benefit Cost Ratio
- Module 25 - Internal Rate of Return
- Module 27 - Economic Analysis.

XIII. PROJECT COMPONENT NINE: PROJECT SUMMARY

1 <i>Problem or Need</i>	2 <i>Objectives and Outputs</i>	3 <i>Demand and Market</i>
8 <i>Costs and Benefits</i>	9 <i>Project Summary</i>	4 <i>Technology</i>
7 <i>Project Life and Schedule</i>	6 <i>Organisation and Management</i>	5 <i>Human and Physical Resources</i>

13.1 *Purpose:*

The purpose of the project summary is to bring together in one component the essential elements of the project in a very brief statement. It should give the reader a concise picture of the project, including the major elements of each component. It should not attempt to give details which are in the main document, but give an overview so the reader knows what is proposed and what to look for, in greater detail, throughout the project study.

13.2 *Relation to other Components:*

Although the project summary is generally at the beginning of a project study, it is the last component to be written because it depends upon the design of all other components. It highlights information from all other components that are relevant and gives a diagnostic overview of the project proposal.

13.3 *Developing a Project Summary Statement*

The project summary can be written only after all other components of the project have been shaped and integrated so that the conceptualization of the project idea is complete. The Project Summary highlights the predominant aspects or elements of the various components to present an overview of the project. As an introduction to the project, it should be concise and easily understood. As a description of what the project is essentially, it points out the project's unusual or innovative features as well as the basic project outlines. It will include brief definitions of the project objectives, location, size components, costs, phasing, manner of execution, pattern of production and expected results. The purpose of the summary is to define the project idea for the reader so the reader can know what to expect in the more detailed sections describing the various project components.

The Project Summary is often abstracted from the project document for wider distribution. It may, for example, be distributed to potential implementing and/or financing agencies who are considered for support of the project. In general, the summary should cover the following points: 34

- (a) a brief statement of the physical, economic and institutional characteristics and the importance of the project area in relation to the national or sectoral interests;
- (b) a concise statement about the nature of the project, its main objectives within the specified time period and its scope;
- (c) a review of the status of available data (physical, technical, economic, institutional) related to the project and the project area;
- (d) a broad description of the proposed works and action and identification of any major constraints on project completion or of measures necessary for their amelioration;
- (e) a brief summary of the market and demand prospects for the project output, with comments on marketing strategies as appropriate;
- (f) a description of the organisational and management requirements necessary to carry out the project;
- (g) a provisional estimate of the costs involved and of foreign exchange requirements, and estimates of project benefits and net returns;

AN EXAMPLE OF A LOGICAL FRAMEWORK

Life of Project:
From Fy ____ To Fy ____
Total Donor Funding ____
Date Prepared _____

Project Title & Number: Public Sector Training - Jamaica

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS																																														
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <p>To ameliorate economic and social conditions in Jamaica by improving administrative practices</p>	<p>Measures of Goal Achievement:</p> <ul style="list-style-type: none"> - Increased flow of development resources to the rural sector - Increased rural incomes 	<ul style="list-style-type: none"> - UNDP and IBRD statistics - National income statistics 	<p>Assumptions for achieving goal targets:</p>																																														
<p>Project Purpose: To develop an institutional capacity to identify, finance and implement training for the public sector</p>	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <ul style="list-style-type: none"> - Training Plan completed - 500 Jamaican civil servants receive training - Ongoing survey of training needs 	<ul style="list-style-type: none"> - Administrative Commission Records - Project evaluations 	<p>Purpose to Goal assumptions</p> <ul style="list-style-type: none"> - GOJ budgetary resources will be adequate to raise civil service salary levels - Necessary institutional reforms will be implemented 																																														
<p>Outputs:</p> <ol style="list-style-type: none"> 1. Training needs study 2. Expansion of Management Training Institute 	<p>Magnitude of Outputs:</p> <ol style="list-style-type: none"> 1. One study detailing public sector training needs 2. 7,000 sq. ft. facilities plus related equipment 	<ul style="list-style-type: none"> - Project Files - Project evaluations 	<p>Output to Purpose Assumptions</p> <ul style="list-style-type: none"> - U.S. T.A. personnel are available or other arrangements can be made to obtain required T.A. 																																														
<p>Inputs:</p>	<p>Implementation Target (Type & Quantity)</p> <table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">USAID (\$'000's)</th> <th rowspan="2">TOTAL</th> </tr> <tr> <th>GRANT</th> <th>GOJ</th> </tr> <tr> <th></th> <th>US\$</th> <th>US\$</th> <th>US\$</th> </tr> </thead> <tbody> <tr> <td>Studies</td> <td>80</td> <td></td> <td>80</td> </tr> <tr> <td>Training Fund</td> <td>570</td> <td></td> <td>570</td> </tr> <tr> <td>Participant Salaries</td> <td></td> <td>263</td> <td>263</td> </tr> <tr> <td>Materials and Equipment</td> <td>100</td> <td></td> <td>100</td> </tr> <tr> <td>Training Facilities</td> <td>150</td> <td></td> <td>150</td> </tr> <tr> <td>Operating Costs</td> <td></td> <td>350</td> <td>350</td> </tr> <tr> <td>Technical Asst.</td> <td>96</td> <td></td> <td>96</td> </tr> <tr> <td>Contingency</td> <td>4</td> <td></td> <td>4</td> </tr> <tr> <td></td> <td><u>1,000</u></td> <td><u>613</u></td> <td><u>1,613</u></td> </tr> </tbody> </table>		USAID (\$'000's)		TOTAL	GRANT	GOJ		US\$	US\$	US\$	Studies	80		80	Training Fund	570		570	Participant Salaries		263	263	Materials and Equipment	100		100	Training Facilities	150		150	Operating Costs		350	350	Technical Asst.	96		96	Contingency	4		4		<u>1,000</u>	<u>613</u>	<u>1,613</u>	<ul style="list-style-type: none"> - USAID controllers records - GOJ Ministry records - MOF, GOJ records 	<p>Assumptions for providing inputs:</p> <p>Inputs required are available</p>
	USAID (\$'000's)		TOTAL																																														
	GRANT	GOJ																																															
	US\$	US\$	US\$																																														
Studies	80		80																																														
Training Fund	570		570																																														
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Technical Asst.	96		96																																														
Contingency	4		4																																														
	<u>1,000</u>	<u>613</u>	<u>1,613</u>																																														

- (h) the relationship of the project to other projects and programmes in the relevant sector(s).
- (i) a listing of all recommendations for further action regarding the development of the project; and
- (j) the justification for the project.

The Logical Framework is an excellent summarising instrument for project description which can be included in the Project Summary. The Logical Framework basically:

- i) defines project inputs, outputs, purpose and goal in measurable or objectively verifiable terms;
- ii) hypothesizes the causative linkage between outputs, purpose and goals; and
- iii) establishes the indicators that will permit subsequent measurements or verifications of achievements of the defined outputs, purpose and goal. 35

The basic design of the project can be presented by the Logical Framework*, (See FIGURE 21) in a clear definition of the logical hierarchy of project purposes, that is, from *Project Inputs* to *Project Outputs* which will result in achieving the *Project Purpose* which will have a result of a significant contribution or impact on the *sector goals* of the project setting. This vertical logic of the Logical Framework illustrates the basic project hypotheses about achieving the desired changes through the project. Presented with the Project Summary, it provides the bare outlines of the project and clarifies the logical progression of the development project, i.e:

- i) if adequate inputs are provided, then planned outputs will be produced;
- ii) if these outputs are produced, then purpose will be achieved; and
- iii) if the purpose is achieved, then the planned degree of change toward the higher goal will occur.

* See Module 2 - Logical Framework

The Logical Framework also leads to the evaluation of the project. First of all there is an evaluation of inputs, then outputs, then project impacts in terms of *purpose* and *goals*. To complete the Logical Framework, sufficient work must have been done on project components to permit quantification of *verifiable* indicators for all levels from inputs to project goals. These *indicators* form the foundation for project evaluation.

Although the Project Summary is the last component to be written, it is the first to be read. Therefore, it must not be too technical, nor too detailed, nor too sketchy in its presentation. It must be comprehensive enough to give an integrated picture of the project and interesting enough to encourage the reader to explore the various components in more depth. It is a very important part of project documentation -- but entirely dependent upon all other components, and should never be completed until sufficient attention has been given to the details of all other project components.

13.4 *Techniques and Products:*

The primary tool for use here is the Logical Framework along with a good sense of the project so that the major points can be effectively summarised to catch the attention and interest of the readers, causing them to explore the project document in greater detail.

13.5 *Relevant Modules:*

- Module 1 - Defining Project Objectives
- Module 2 - Logical Framework
- Module 18 - Project Profile Preparation.

XIV. SUMMARY

Purposeful planning produces a plan in which all facets of a project have been designed and analyzed to facilitate successful implementation. This requires careful documentation of the full set of data so that:

- 1) every project idea is fully conceptualized; and
- 2) comparisons can be made between projects to choose the best project within the existing circumstances.

Limits imposed by scarce physical and human resources make it impossible to take on every project idea, even if they were all good ideas. Project documentation is the foundation for decision-making with respect to project selection and implementation. The Project Skeleton provides the basic framework for presenting a full set of project data. The extent and detail of the data will depend upon the stage of planning which a project has reached. However, the nine components of the Project Skeleton are common to all project documents, such as Project Profiles and Feasibility Studies.

The logical construction of a project plan from a project idea, follows the general progression from Component One (Project Problem or Need) through Component Eight (Costs and Benefits) to the Project Summary which highlights the most important aspects of all components.

In general, the planning of a project follows the logic of the component of the Project Skeleton; so identification of the Problem leads to a statement of the Objective, the hierarchy of objectives results in specific outputs for which the demand and market must be determined, the demand for the outputs of the specific project give the general level of production of goods or services which is a major determinant of the project technology (though not the only determinant), when technology is selected it is possible to identify the resource needs of the project (material and human), and when the resources are identified, the organization of the project can be determined by identifying the sources of all resources. Then it is possible to schedule the project, as all activities necessary to mobilize the resources and integrate them into the project technology are known. And finally, with the project scheduling and timing complete, it is possible to value the costs and the benefits of the project over time. The salient points from

all of these components become part of the project summary which is written as an overview of the proposed project for the reader of the plan.

The Project Profile is a project document used initially to conceptualize a project idea and is the basis for making a pre-selection of those project ideas which will be promoted to the level of a Feasibility Study. The completion of the Project Profile should be based upon existing data and should attempt to state the objectives of the project clearly to determine the priority of the project in light of government and sector goals. The accuracy of cost and data is not expected to be as precise as in a Feasibility Study. The purpose is to limit the expenditure of funds and energy until a project idea has been approved for more detailed planning. However, the Project Profile requires information on all components of an idea, as does a Feasibility Study.

In completing any project planning document, at least these nine project components must be examined. Depending upon the detail expected, different tools and techniques may be relevant. Early planning relies more on the statement of assumptions, while *later planning requires detailed studies to determine the validity of the planning premises and assumptions*. In Figure 22, a summary of the techniques and tools which are associated with each component is shown along with some of the planning "outputs" or documents associated with each component.

The outputs for the components are based upon the "internal logic" of the Project Skeleton, but in all planning there is a reiteration, because of the interdependencies between project components. As later components are explored, decisions may be made which demand a change in the design of earlier components. Thus, a discovery that there is a scarcity of certain resources (Component Five) may lead to a re-examination of the appropriate technology (Component Four)-or even a re-statement of the project objectives (Component Two), and so on.

The logic of the Project Skeleton is only illustrative. There is actually a very complex set of relationships that exists between the project components. (See Figure 10) The project planner must understand these relationships, especially as the complexity increases during the later stages of planning.

FIGURE 22: COMPONENTS OF THE PROJECT SKELETON AND ASSOCIATED
PLANNING DOCUMENTS AND TOOLS

COMPONENT	PLANNING DOCUMENTS	SUPPORTING DOCUMENTS	TOOLS/TECHNIQUES
	<u>Output</u>		
One: Problem/Need Statement	Problem Definition Project Area Statement History of Project Idea	Problem/Need Surveys Problem Forecast Policy/Programme Review Project-Problem History Project Area Surveys Sector Surveys	Problem/Needs Analysis Force-Field Analysis Problem Impact Analysis Forecasting Brainstorming Problem Diagramming Social Surveying Analysis
Two: Project Objectives and Outputs	Statement of Objectives Output Definitions Objective Indicators	Diagram of Objectives Hierarchy of Objectives Logical Framework (draft) Policy/Programme Reviews	Ends-Means Analysis Objective Trees/Diagrams Force-Field Analysis Brainstorming Logical Framework
Three: Demand and Market Statement	Output Specifications Levels of Total Demand Demand Forecast for Project Output Marketing Strategy	Market Statistical Series Statistics on demand determinant factors Analysis of distributive mechanisms Analysis of competition Market Flow Diagrams Policy/regulations and Standards Reviews	Forecasting Regression Analysis Analysis of Elasticity Co-efficients Supply-Demand Analysis Market Distribution Analysis Market Flow Analysis
Four: Technology Selection Statement	Technology Alternatives Technology Choice Location Statement Physical Requirements Output Specifications Plant/Site Layouts	Technology Alternatives Analysis Rationale for Selection Advantages-Disadvantages of Technology Selection Forward and Backward	Criteria for Technology Analysis Appropriate Technology Strategies Technical Analysis Organization and Management

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P. 113	Material/Supply Requirements Organization and Management Requirements Environmental Impact Statement	Linkages Production Support Requirements Equipment Specifications and Sources	Analysis Technological Linkage Analysis Ecological Analysis
Five: Resource Requirements Statement	Raw Material Quantities and Specifications Supplies Specifications Manpower Requirements and Qualifications Areas of Scarcities and Sources of Supplies/ Materials	Regulations, Provisions and Guidelines on Materials and Supplies Job Descriptions Resource and Manpower Surveys	Surveying of Skills Job Definitions Procurement Procedures Contracting
Six: Project Organization Statement	Organization Location Project Organization Chart Organizational Support from Parent and Sponsor Organizations Linear Responsibility Charts	Summary of Policies, Programmes and Regulations or Administrative Procedures Decision-Making Systems Parent Organization Chart	Organizational Analysis Administrative Procedures and Guidelines Development Linear Responsibility Charts Organization Charts
Seven: Project Schedules	List of Activities Master Schedule	Precedence of Network Diagrams Work Breakdown Structure Manpower and Resource Charts	Work Breakdown Structure Network Diagramming Bar Chart Scheduling Manpower and Resource Charts
Eight: Cost and Benefit Statements	Cash Flow Investment Schedule Funding Sources	Capital Cost Estimates Recurrent/Operating Cost Estimates Revenue Estimates Review of Funding Agencies and Policies Disbursement and Payback Procedures	Cash Flow Financial Analysis Discounting and Financial Appraisal Economic Analysis Financial Procedures
Nine: Project Summary	Summary Project Description Logical Framework (Final)	List of Critical Assumptions Areas for further Study	Logical Framework

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The nine components of the Project Skeleton are the foundation for project documentation. The planner can use this foundation, which is initially developed through the Project Profile, for all stages of project planning. It can also be adapted to the wide variety of planning documents which have been specially developed by the various international and commercial agencies. This comprehensive and integrated approach to documenting project plans can help ensure sound project conceptualization, attract project funding, and facilitate successful implementation.

FOOTNOTES

1. David I. Cleland and William R. King, *Systems Analysis and Project Management*, McGraw-Hill Books Company, New York, 1968. p. 184.
2. Raymond Radosevich, *Development Project Management: An Integrated Approach to Project Planning and Implementation*, Graduate School of Management, Vanderbilt University, 1974.
3. Albert O. Hirschman, *Development Projects Observed*. The Brookings Institute, Washington, D.C., 1967.

Hirschman refers to development projects as "privileged particles in the development process" (page 1) and calls project implementation "a long voyage of discovery in the most varied domain from technology to politics." (page 35)

A.J. Creshkoff, *The Planning and Management of Projects in Developing Regions* (draft, limited circulation) Chapter 1, Graduate School of Public and International Affairs, University of Pittsburgh, Pittsburgh, Pa., 1976.

Creshkoff identifies five basic and common components of a definition for a project:

- (a) a project is a discrete activity;
 - (b) a project has specific objectives;
 - (c) a project is coherent organized actions;
 - (d) a project has a definite spatial and temporal location; and
 - (e) a project has a scheduled beginning and ending.
4. This figure is a revision of Figures 3 and 4 in Morris Solomon, *Elements of Project Management*, Development Project Management Center, USDA, Washington, D.C., 1976, pages 6 and 11.
 5. *Ibid.*, pp. 6-11.
 6. P.D.R.T., *A Project Planning Manual* (PDRT01), Project Development Resource Team, Projects Division, Ministry of Finance & Planning, Government of Jamaica, Kingston, Jamaica. January, 1977.

7. John Rubel, "An Outline of Implementation Considerations: Some Notes That Should be Useful to Trainers in Project Implementation", Development Project Management Center, USDA, Washington, D.C., n.d., Module 1.0.
8. F.A.O., *General Guidelines to the Analysis of Agricultural Production Projects*, No. 14 of Agricultural Planning Studies, F.A.O., of the United Nations, Rome, 1971. p. 7.
9. Morris Solomon, *op. cit.*, p. 17.
10. A.J. Creshkoff, *op. cit.*, Chapter 10.
11. Edgar H. Schein, *Process Consultation: Its Role in Organization Development*, Addison-Wesley Publishing Co., Reading Mass., 1969. Chapter 5.
12. F.A.O., *op. cit.*, pp. 13-14.
13. See Morris Solomon, *op. cit.*, pp. 23-32 for a fuller discussion of the relationships between objectives.
14. John Rubel, *op. cit.*, Module 3.0.
15. Goal-setting criteria relative to the SPIRO model are identified as
 - S -- Specificity: Exactly what are you trying to accomplish?
 - P -- Performance: What behaviour is implied?
 - I -- Involvement: Who is going to do it?
 - R -- Realism: Can it be done?
 - O -- Observability: Can others see the behaviour?

J.W. Pfeiffer and J.E. Jones, *A Handbook of Structured Experiments For Human Relations Training*, Volume 11. University Associates, San Diego, Calif., p. 84.
16. U.N., *Manual on Economic Development Projects*, United Nations, New York, 1958. (Sales No. :E.58.11.G.5) pp. 11-12.
17. Baldwin, G.B. "Outline Market Analysis for Project Appraisals" (mimeocopy) Economic Development Institute, Washington, D.C., 1968. pp. 1-2.
18. *Ibid.*, p. 1.

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19. See U.N., *op. cit.*, Chapter II.
20. *Ibid.*, pp. 11-23.
21. For a fuller discussion of the marketing functions and roles, see J.C. Abbott, "What Marketing Means." Chapter 11 of *Marketing Problems and Improvement Programmes*, F.A.O. Marketing Guide No. 11, F.A.O., Rome, Italy, 1958, pp. 7-41.
22. World Bank, *Appropriate Technology in World Bank Activities*, World Bank, Washington, D.C., July, 1976, 1976. pp. 1-2.
23. Summarized from U.N., *op. cit.*, Chapters 3 and 4.
24. Summarized from *Ibid.*, pp. 100-127.
25. *Ibid.*, pp. 100-111.
26. One of the best known books on appropriate technology is E.F. Schumacher, *Small is Beautiful: Economics as if People Mattered*, Harper & Row, New York, 1975.
27. World Bank, *op. cit.*, p. 5.
28. Morris Solomon, *Preparing, Evaluating and Managing Development Projects*, Institute of Administration, University of Ife, Nigeria, 1972, see Chapter 10, and particularly Chart 10.1 identifying forward linkages from a Sugar Crushing Mill, such as Food Products, Chemical Derivatives, Paper, Fiberboard and Furniture.
29. F.A.O., *op. cit.*, p. 21.
30. See Robert Youker, *Organizational Alternatives for Project Management*, Economic Development Institute, World Bank, (mimeocopy), n.d.
31. Milton J. Esman, "The Elements of Institution-Building" in M.J. Esman (ed.) *Institution Building and Development, from Concepts to Application*, Sage Publications, Beverly Hills, Calif., 1972. pp. 21-33.
32. There are many sources covering the topic of scheduling --bar charts and network diagramming. The coverages of these topics along with other relevant project planning tools is excellently summarized in Peter Delp, Arne Thesen, Juzar Motiwalla, and N. Seshardri, *Systems Tools for Project Planning*, PASITAM, International Development Institute, Indiana University, Bloomington, Indiana, 1977. Capter XI.

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33. John Rubel, *op. cit.*, Module 8.0.
34. F.A.O., *op. cit.*, pp. 11-12.
35. For a brief description of the Logical Framework and variations on design, see AID, *The Logical Framework -- Modification Based on Experience*, Agency for International Development, Washington, D.C., 1973.