

PREFACE

Projects and operations are often considered similar as both are planned, implemented and controlled to produce results within specified resource constraints. But unlike operations, a project is undertaken to produce a unique deliverable. Projects play a crucial role in an organization's corporate strategy, and in the case of governments, they are critical to the success of governmental policies and initiatives.

Although many of its tools are derived from other management disciplines, project management is a specialized field, with unique management techniques such as critical path analysis and work breakdown structures. Today, the application of project management techniques is no longer limited to projects in construction and engineering sectors; these techniques are also applied to projects in fields as diverse as education, healthcare and software development. The use of projects and project management to accomplish many and diverse aims of society's varied organizations continues to grow.

Project Management describes the project management functions that are carried out at the different stages of a project's life cycle. The book is intended to help students and other readers understand the complexities involved in handling projects and managing the various phases of the project life cycle.

What is a Project?

All organizations are made up of processes and projects. **Processes** are how you get work done on the day to day repetitive basis- those activities that you do to keep the organization operational. **Project** is a finite endeavor (having specific start and completion dates) undertaken to create a unique product or service which brings about beneficial change or added value. This finite characteristic of projects stands in sharp contrast to processes or operations, which are permanent or semi-permanent functional work to repetitively produce the same product or service.

A project is a short term effort we do to meet the organizations strategic objectives. It is how organizations implement changes. Here are several examples of why organizations pursue project:

- Improve your day to day operational processes (like upgrading your accounting system).
- Get a new product or service to market.
- Meet a government compliance requirement.

What is Project Management?

Project management is the discipline of planning, organizing and managing resources to bring about the successful completion of specific project goals and objectives. It is

- A systematic approach to managing projects.
- A way to generate consistent results when undertaking new initiatives.
- A powerful business tool that can transform firm business.

The primary challenge of project management is to achieve all of the project goals and objectives while honoring the project constraints. Typical constraints are scope, time, and budget. The secondary and more ambitious challenge is to optimize the allocation and integration of inputs necessary to meet pre-defined objectives. A project is thus a carefully defined set of activities that use resources (money, people, materials, energy, space, provisions, communication, motivation, etc) to achieve the project goals and objectives.

Everyone is involved from time to time in carrying out projects, whether it is a small task, like planning a vacation or a large activity, like a development project in a business or other organization. Projects differ very much from on-going routine operations and are usually one-off unique events with a characteristic life cycle and well defined goals and objectives. Within organizations, project management has become increasingly important in the past decade for many and varied reasons.

Project management can be contrasted with operations management and also with the functional management of organizations. Although effective project management does not require completely different skills and methods to those required in other areas of management, the emphasis changes and some skills become much more important, and new techniques are needed. Typically, not only are projects unique events but, if they are of any significant size and importance to the organization, they will cut across the normal functional and departmental boundaries within the organization and bring together teams of people with differing backgrounds, skills, allegiances and so on.

The book aims to introduce project management methods in a way which links to the life cycle of a typical project from the early project identification and definition stages, through project execution and control, to issues of implementation and change. The coverage of the early stages of the project cycle uses methods emerging from the systems movement and stresses the strategic relevance of project management. The operational management of the project is covered by introducing techniques for the planning, scheduling and controlling of projects. Attention is also given to people management aspects of this process especially to leadership, team working, motivation and direction. Emphasis is placed on the role of projects in the management of change within organizations and the approaches needed to achieve successful implementation.

Why study the book?

Project management is an expanding field which offers exciting and challenging career opportunities. For those of you considering a career in project management, this book provides a clear and comprehensive introduction to this area. Project management knowledge and skills are also highly valued within organizations. The book introduces you to project management concepts and techniques which will be of use to you in many management roles as organizations increasingly need to manage complex and novel changes. This may be as a project manager; managing in-house projects as part of a management role; as a consultant to project teams; or as a client to a project.

The book integrates the theory of project management with practical examples, as well as giving you the opportunity to link the theory to your own experience, so enabling you to use the knowledge you have gained on this text in your future career. The activities and questions emphasize developing transferable reflective-thinking skills within the context of project management.

What are the topics covered in the book?

The book is primarily intended for use as a textbook for teaching project management at the undergraduate and postgraduate level. It is also intended for current and prospective project managers and project teams.

The book addresses project management from a management perspective. It is arranged using the project life cycle as the primary organizational guideline. The life cycle approach is found to be a comfortable framework for the reader. The book consists of the following eleven chapters:

- Chapter 1: Development Project Concepts
- Chapter 2: Project Cycle
- Chapter 3: Project Identification
- Chapter 4: Project Preparation (Formulation)
- Chapter 5: Project Proposal Formulation
- Chapter 6: Project Financial Analysis (Appraisal)
- Chapter 7: Project Economic Analysis (Appraisal)
- Chapter 8: Project Environmental Impact Assessment
- Chapter 9: Project Gender Analysis
- Chapter 10: Project Implementation Planning and Organizing
- Chapter 11: Project Implementation Monitoring and Evaluation

Despite my sober effort and the help received from various scholars, certain shortcomings might have remained for which I am responsible alone. I shall be thankful to the readers if they inform me about any shortcomings in the material via my e-mail ID: tesfations@yahoo.com.

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Most praise to the Almighty God, Lord of Creation, for his infinite mercy and blessing that came to my support and brought this book to a successful conclusion. Hence, I bow for his gratefulness whose grace enabled me to complete the book.

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CHAPTER ONE: DEVELOPMENT PROJECT CONCEPTS

INTRODUCTION

Projects are one of the several instruments to achieve particular objectives in a process of development. Thus, projects have to be discussed as an integral part of the national development strategy or they have to be evaluated in close reference to the overall development policy of a country. Projects have been described as **'the cutting edge'** of development; these embody the policy choices flowing from development objectives and act as the vehicles or the medium of the described social changes. Then, projects are the means through which development targets are achieved and are considered to be a tangible benefit for the project beneficiaries. Without visible projects on the ground, policies, strategies and plans for development are simply administrative rhetoric.

LEARNING OBJECTIVES

After studying this chapter, you should be able to:

- Understand the concept of a project
- Identify the types/classification of projects
- Understand the importance and main features of a project
- Differentiate between projects and programs
- Understand the role of project manager
- Understand the project management environment
- Understand the project organization structure and the management-by projects

1.1: THE CONCEPT OF A PROJECT

The past several decades have been marked by rapid growth in the use of project management as a means by which organizations achieve their objectives. Project management provides an organization with powerful tools that improve its ability to plan, implement, and control its activities as well as the way in which it utilizes its people and resources.

According to Meredith and Mantel (2006), project management has emerged because the characteristics of our contemporary society demand the development of new methods of management. Of the many forces involved, they pointed out the following three paramount forces fostering project management:

- The exponential expansion of human knowledge,
- The growing demand for a broad range of complex, sophisticated, customized goods and services, and
- The evolution of worldwide competitive markets from the production and consumption of goods and services.

All the three forces combine to mandate the use of teams to solve problems that used to be solvable by individuals. These three forces combine to increase greatly the complexity of goods and services produced plus the complexity of the processes used to produce them. This in turn leads to the need for more sophisticated systems to control both outcomes and processes. The direct project objective is to yield a given outcome with the budgeted cost, scheduled time and prescribed quality.

In most cases it is easier to describe than to define a project. However, a project is generally referred to as a discrete package of investments, inputs and activities, designed to remove or alleviate various development constraints in order to achieve one or more objectives aimed at improving the quality of life of a group of target beneficiaries over a given time span.

The common characteristics that a project might be expected to have is that a project involves the investment of scarce resources in the expectation of future benefit; can be planned, financed and implemented as a unit, often projects are the subject of special financial arrangements and have their own management; has a specific starting and finishing time in which a clearly defined set of objectives is expected to be achieved, usually achievements of those objectives can be measured; and has a conceptual boundary, usually geographical but sometimes organizational.

1.2: DEFINITION OF A PROJECT

According to the British Standard 6079 of 1996 (as cited by ICMR, 2007), a project is defined as a unique set of coordinated activities, with definite starting and finishing points, undertaken by an individual or organization to meet specific objectives within defined schedule, cost, and performance parameters. The Project Management Institute (2004) has also defined a project as a temporary endeavour undertaken to create a unique product or service.

Project has also defined by many authors as:

- A set of proposals for the investment of resources into a clearly identified set of actions that are expected to produce future benefits that exceeds costs.
- A proposed undertaking involving a complex of economic activities in which scarce resources are committed in expectation of benefits that exceed the costs.

- The "cutting edge" of development which is the powerful means to achieve the development objectives; it is the crucial building block of a development structure.
- Any undertaking with a defined starting point and defined objectives by which completion is identified. Most projects depend on finite or limited resources by which the objectives are to be accomplished.
- A one shoot, time limited, goal directed major undertaking, requiring the commitment of various skills and resources.
- A combination of human and non-human resources pooled together in a temporary organization to achieve a specific purpose.

In short, project is a specific, one-time and finite task to be accomplished with a well-defined set of desired end results.

Examples of a project are:

- New business establishment,
- Expansion of existing business,
- Launching new product,
- Replacement of old equipment, machinery, etc.,
- Environmental protection,
- Cost reduction project,
- Total Quality Management (TQM), etc.

The above alternative definitions and explanations indicate that a project is something unique or different from the usual way of doing things. It is time bound, separate from other activities, uses assigned resources and it is meant to achieve specific objectives. The above definition of project is equally applicable to most types of projects.

Activity 1.1: One author defined project as “a one shoot, time limited, goal directed, requiring the commitment of various skills and resources”. Therefore, explain in brief what he meant by a “one shoot”, “time limited”, and “goal directed”.

1.3: CLASSIFICATION OF A PROJECT

1.3.1: Project may be broadly classified as:

- **Industrial/Commercial projects**
For example, establishment of factories, industries, service rendering enterprises, etc.
- **Agricultural projects**
For example, establishment of farming, breeding, forestry, horticulture, fishery, etc.
- **Infrastructure projects**
For example, establishment of roads, airport, schools, health stations, hospitals, universities, etc.

1.3.2: Alternative classification of projects:

a) **Basically, three types of project can be identified depending upon how new resources committed to them relate to existing economic activities:**

- **New Investment**

Designed to establish a new productive process independent of previous lines of production. They often include a new organization, financially independent of existing organization.

- **Expansion Projects**

Repeating or extending an existing economic activity with the same output, technology and organization.

- **Updating projects**

Replacing or changing some elements in an existing activity without a major change of output. It involves some change in technology but with in the context of an existing though possibly reformulated organization.

b) **Classification by Goals:**

- **Nature of goods and services produced** - quantified and non-quantified.

- **Type of Consumption** - to meet domestic demand and export demand; economic goods and social goods.

c) **Classification by time elapsing between the initial investment and the obtaining of final results** - projects of long and short duration; projects with rapid and low amortization period; etc.

d) **Classification with respect to complexity** - highly and low complex.

e) **Classification with respect to age:**

- **Green field/grass-root project** is a project starting for the first time or starting from scratch, every thing is new.

- **Brown field project** is a project that exists but shifting its resources to other places or field of work, starting a new course.

f) **Classification based on Time, Cost, and Performance (Quality):**

- **Normal project** is a project not much problem is faced as per time, cost, and performance, i.e., completed with the set time, cost, and quality.

- **Crash project** is a project, for many reasons, completed by a crash program that entails less time, high cost, and with a compromising quality, i.e., likely quality will decrease.

- **Disaster project** is a project that is not performing as per the set plan. Therefore, it needs immediate remedy that entails less time, high cost and likely low quality. It is an opposite of the **normal project**.

Whatever type of project is being analyzed, the effect of using new resources has to be distinguished from the effect of existing operations. The incremental resource costs have to be identified. Similarly, the incremental benefits have to be identified. Both incremental costs and benefits have to be valued. For a new investment the whole of the output and the whole of the costs will be incremental; for expansion and updating projects, the effects of the new resources have to be separated from the effects of existing resources.

Project costs are generally easier to identify and estimate than project benefits. Costs may be met directly by a particular institution; benefits are frequently more diverse. A distinction can be drawn between directly productive and indirectly productive projects.

Directly productive projects are those whose immediate costs and benefits accrue to a single organization. However, indirectly productive projects are those where the benefits derived from new resources do not accrue to the organization responsible for carrying the costs, for example, infrastructure projects. When ever possible, the estimated benefits from indirectly productive projects should be incorporated in the **project resource statement** (i.e., a statement used to list project's cost and benefit flow over its project life).

Activity 1.2: Differentiate between Brown Field and Green Field Projects in brief by giving live illustration from the projects around your environment.

1.4: IMPORTANCE AND MAIN FEATURES (CHARACTERISTICS) OF A PROJECT

1.4.1: WHY PROJECT MANAGEMENT?

Why Project Management?

There is no doubt that organizations today face more aggressive competition than in the past and the business environment they operate in is a highly turbulent one. This scenario has increased the need for organizational accountability for the private and public sectors, leading to a greater focus and demand for operational effectiveness and efficiency.

The Project Management Institute (2004) has defined Project Management as the application of knowledge, skills, tools and techniques to project activities in order to meet or exceed stakeholder needs and expectations. Effectiveness and efficiency may be facilitated through the introduction of best management practices that are able to optimize the management of organizational resources. Project management can: (a) support the achievement of project and organizational goals; and (b) provide a greater assurance to stakeholders that resources are being managed effectively.

Azzopardi (2007) reported that using a reasonably detailed project management methodology, as compared to a loose methodology, improves productivity by 20-30%. Furthermore, the use of a formalized project management structure to projects can facilitate: (a) the clarification of project scope; (b) agreement of objectives and goals; (c) identifying resources needed; (d) ensuring accountability for results and performance; (e) and encouraging the project team to focus on the final benefits to be achieved. Moreover, He also portrayed that 85-90% of projects fail to deliver on time, on budget and to the quality of performance expected. The major causes identified for this situation include:

- Lack of a valid business case justifying the project;
- Objectives not properly defined and agreed;
- Lack of communication and stakeholder management;
- Outcomes and/or benefits not properly defined in measurable terms;
- Lack of quality control;
- Poor estimation of duration and cost;
- Inadequate definition and acceptance of roles (governance);
- Insufficient planning and coordination of resources.

The causes for the failure to deliver on time, on budget and to the quality of performance expected could be addressed by the application of project management practices. Thus, Project management should be viewed as a tool that helps organizations to execute designated projects effectively and efficiently.

Authors such as Davis (1974) and Ibbs and Kwak (1997) reported that actual experience with project management (such as through the currently popular Six-Sigma projects) indicates the majority of organizations using it experience:

- Better control and better customer relations,
- Increase in their project's return on investment (ROI),
- Shorter new product development times,
- Lower costs, higher quality and reliability,
- Higher profit margins,
- Sharper orientation toward results,
- Better interdepartmental coordination, and
- Higher worker morale.

On the whole, the general **importance of project management** can be summarized as follows:

- It ensures the **optimum utilization of scarce resources** (human and non-human, i.e., capital) towards meeting social objectives and economic growth.
- It is a tool to facilitate the preparation of investment areas that are technically, financially, economically, socially, etc sound.

1.4.2: STRATEGIC MANAGEMENT AND PROJECT SELECTION

In addition to project management's great utility when correctly used, however, its utility has also led to many misapplications. According to Cleland and King (1983), the rapid adoption of project management means there are many projects that are:

- Falling outside the organization's stated mission,
- Completely unrelated to the strategy and goals of the organization, and
- Excessive with funding levels relative to their expected benefits.

Thomas et al. (2001) have found that:

- 30% of all projects are canceled mid-stream,
- over 50% of completed projects came in up to 190% over budget, and
- 220% late.

This same study found that the primary motivation of organizations to improve and expand their project management processes was:

- Due to major troubled or failed projects,
- Due to new upcoming mega-projects, or
- To meet competition or maintain their market share.

A major development among those choosing to develop project management expertise in house, particularly those interested in using projects to accomplish organizational goals and strategies, is the initiation of a project management office (PMO). This office strives to develop multi-project management expertise throughout the organization and evaluate the interrelationships both between projects and between projects and the organization's goals.

It is expected that the PMO will:

- Promote those projects that capitalize on the organization's strengths,
- Offer a competitive advantage,
- Mutually support each other, and
- Avoid those projects with resource or technology needs in areas where the organization is weaker.

The challenges thus facing the contemporary organization are:

- How to tie their projects more closely to the organization's goals and strategy,
- How to handle the growing number of ongoing projects, and
- How to make these projects more successful.

Therefore, given that the organization has an appropriate vision, mission statement and strategy; projects must be selected that are consistent with the strategic goals of the organization. **Project selection** is the process of evaluating individual projects or groups of projects and then choosing to implement some set of them so that the objectives of the parent organization will be achieved.

1.4.3: CHARACTERISTICS

a) General Characteristics

A project is something unique or different from the usual way of doing things. It is time bound, separate from other activities, uses assigned scarce resources and it is meant to achieve a specific objectives. Its general characteristics are summarized as follows (Choudhury, 1988; Gizaw, 2003; Joy, 1994):

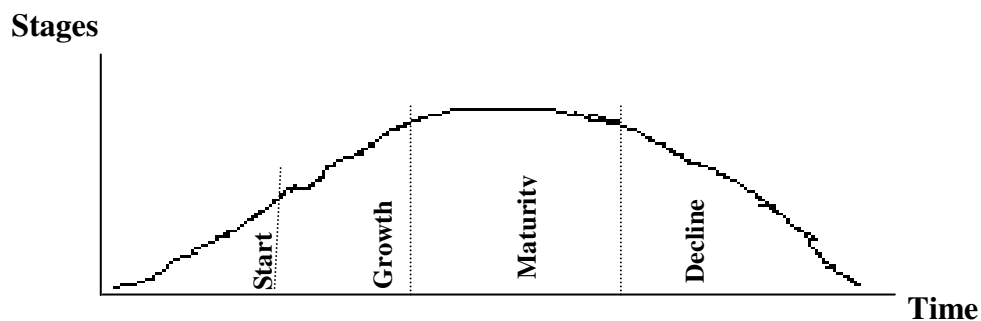
- Projects involve the commitment of scarce resources to a specific line of action that prevents the use of those resources elsewhere. These resources include: financial capital, raw materials, the product of manufacturing and service capacity else where in the economy, labor of various kinds, managers and organizations, and so on. Almost all of these are certain to have an alternative possible use elsewhere.
- Projects resources are committed for a long period to produce benefits that are usually quite clearly identifiable. Their effects are usually gradual and lasting for several years, but involve waiting for results. This waiting obviously has a cost.
- Projects are the subject of special arrangements and procedures for their planning, appraisal, and so on because of the shortage of resources usable for development and the commitment of substantial amounts of resources by projects.
- Projects involve a closely defined action and special financial arrangements, including loans from overseas, development banks, and other agencies. These defined action and financial arrangements tends to give projects a clear boundary and individual identity.
- The pattern of resources commitment in projects is usually for capital investments to be made to establish productive capacity, constraint removing, and physical works that have a long life of operation or use, etc.

b) Specific Characteristics

According to Choudhury (1988), the specific characteristics of a project are identified as follows:

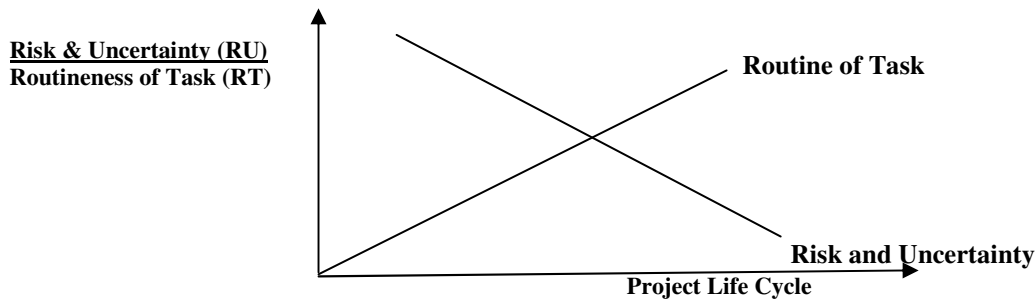
- **Importance-** it must be important in the eyes of top management to justify setting up a special organizational unit outside the routine structure of the existing organization
- **Objective-** it is goal directed, i.e., it is meant to achieve a specific objective.
- **Scarce resource-** it has limited budgeted, both for personnel as well as other resources. An attempt to obtain additional resources leads to conflict with, for example, functional departments.
- **Conflicts-** it competes with other projects or functional departments for resources and personnel.
- **Life span-** it has a beginning and an end.
- **Single entity-** it is distinct and separate entity from others that requires independent pooling of human and non human resources, administration and monitoring, etc.
- **Teamwork-** it is a pool of variety disciplines.
- **Life cycle-** project has a start, growth, maturity and decline stages.

Figure 1.1: Project Life Cycle



- **Uniqueness-** even though the desired end results may have been achieved elsewhere; it is at least unique to this organization. It is different from other projects with regard to the financial requirements, skill requirements, users, managers, technology requirement, etc.
- **Interdependencies-** it interacts with other projects being carried out simultaneously by their parent organization. Its interaction may take the form of resource sharing or competition for scarce resources.
- **Changes-** it is subject/susceptible to changes as the environment (internal/external) is changing. Change comes during its life cycle, especially during its implementation phase. What we conceive/perceive may not be as what we have faced.
- **Successive principle-** it has various stages, i.e., it must be handled in stages because problems, prospectus, constraints, etc come by at the different project stages.
- **Made to order-** projects are often made to order (i.e., a customized product/service made as per the order).
- **Subcontracting-** in case 100% handling of the project is not viable/possible, certain percent of the project can be made on subcontract basis with co-contractor.
- **Risk and uncertainty-** there is risk and uncertainty associated with a given project. The level of risk and uncertainty diminishes as we go to the finishing stage because of the successive principle. However, an ill-defined project will have extremely high degree of risk and uncertainty.
- **Routineness of task-** routine ness of project task increases as we go to the finishing stage.

Figure 1.2: Project Uncertainty vs. Routineness of Task



Activity 1.3: One project expert stated that “Project ensures the optimum utilization of scarce resources”. Do you agree? Why? Explain your opinion in brief by giving an illustration.

1.5: NATIONAL DEVELOPMENT PLANNING AND PROJECT ANALYSIS

National planning is the mechanism by which governments set up their priorities, objectives and demonstrates their intentions. Thus, development planning is the exercise of forethought in an attempt to select the best policies, to be implemented over a medium term period, for the development of the national economy. Viewed in this way, development planning can also be regarded as an attempt to raise the **rationality of decision-making**- carefully specifying objectives and systematically sifting alternative policy instruments so as to find the optimal means of achieving the objectives (Cusworth and Tom, 1993; DEPSA, 1981, 1990; Gittenger, 1972, 1885, 1998).

In general, the essence of development planning is that it is futuristic, i.e. it is forward looking and it involves systematic thought and preparation.

A sound plan required a great deal of knowledge about existing and potential projects. Thus, plans require projects. Since projects commit scarce resources, project selection is meaningful only when it is placed with in a **broader development framework**- the medium or long-term development plans and policy statements issued by the government (Cuury and Weiss, 1993; Gittenger, 1998; Little and Mirrlees, 1974).

The best economic appraisal of projects cannot be made without referring to such plans and policies. The more elaborate the plans and policies of the government, the easier becomes the work of the project planner. For example, the project planner will have to refer to such plans and policies to see to it that the project being considered fits well in the plan and contribute most to the fundamental objectives of the government. These objectives can include self-sustaining growth, promotion of employment and income distribution, etc.

Identifying national development objectives, elaborate sector programs, selecting priority areas for investment, designing effective price policies and mobilizing resources are of great help in identifying development projects. A realistic plan shall be prepared by assessing the development potentials in the various sections of the economy. It is, therefore, obvious that the successful formulation and implementation of a national development plan depends on the proper selection of projects and on the consequent sector programs.

To ensure realistic planning an iterative process with flow of information, suggestions and guidance between decision makers at the macro and micro levels are essential. The exchange of information will facilitate the determination of gaps where new information is needed and studies have to be prepared.

1.5.1: RATIONAL FOR NATIONAL PLANNING

The rational for national planning is (Gittenger, 1998):

- Failure of the market to transform economy. Although the market economy is the better way of tackling problems, private investors may tend to imitate each other.
- People nationally prefer present consumptions to future consumptions. Using national planning, people may tend to increase future consumption by giving up present consumption.
- Projects or investments that are viable to the society may not be profitable for individuals. This is due to the effect of externalities.

Activity 1.4: It is said that “National planning is the mechanism by which governments set up their priorities, objectives and demonstrates their intentions”. Explain in brief what it means by giving example.

1.5.2: PROJECT ANALYSIS

According to Chandra (2006) and Cuury and Weiss (1993), **project analysis** involves estimating and comparing the beneficial effects of an investment with its costs. Such a comparison is done within a broader economic framework that basis on which full costs and benefits are identified and valued. Both the resources required (in the form of finance, materials, and manpower) and the generated benefits (such as cost savings, increased production, and institutional development) are estimated in advance. Costs and benefits are calculated in financial and economic terms or defined (if quantification is not possible) with sufficient precision to permit a reasoned judgment to be made as to the optimum set of actions.

1.5.3: PROJECT PLANNING PROCESS

Project planning process consists of a set of procedures and techniques that can be applied in the process leading up to a decision whether or not to invest and in the implementing and organizing of the project. It is necessary to take project planning to issue efficient utilization of the program and to implement the action program as to the time planned (DEPSA, 1981, 1990). Moreover, project planning has a far-reaching effect on economic development and good project planning is needed as a result it requires well-trained people. Different sectors of project planning need different expertise (Gittenger, 1998).

Project planning has two main characteristics (Little and Mirrlees, 1974):

- It is an exercise that is done to ensure efficient utilization of resources.
- It is a bridge in the transformation of national plans into concrete actions to achieve predetermined objectives.

Project planning is frequently conceived as a series of stages (Chandra, 2006; Gizaw, 2003):

- Identification of investment possibilities,
- Preliminary investigation of investment possibilities through a pre-feasibility study,
- More detailed investigation and implementation plan through a feasibility study, and
- Decision process accepting or rejecting the project.

At each stages of project planning process, a decision is required whether to commit planning resources to the subsequent more detailed stage. Once a project has been accepted further stages involve detailed design and finance negotiations, construction and commissioning and full operation of the project. Projects that a nation chooses to

implement should be of high priority in the national development program. They should be selected only after thorough consideration of alternatives in the economy as a whole and within the particular sector itself, and that proper attention is paid to the linkages between the selected project growth and growth in the other sectors.

Activity 1.5: 1) Briefly explain how the road construction in your environment fit to the national development plan, and 2) Discuss how project analysis and planning contributes to the national development.

Exhibit 1.1: According to the program approach, a development project is formulated and operated in the following national context (Gizaw, 2003):

a) National Policies
 A government must have a clear policy statement. For example: *‘Reduce poverty, Ignorance and disease’*.

b) Strategies
 In the context of that policy, the chosen strategies for poverty reduction may be:

- Enhancement of agricultural production
- Increased social service expenditures
- Expansion of employment opportunities
- Direct income transfers

When one sees such statements, one asks the question: ‘What does that mean and how will it be done?’

c) Legislation
 Policies take effect through legislation, which establishes the institutional framework, for example empowering the Ministry of Agriculture to take action.

d) Programs
 Policies are implemented through programs usually overall lengthy time scale of five to ten years. Programs have broadly expressed development objectives. For example, in the context of a policy of enhancing agricultural production, development objective could be ‘expand and diversify the output of the agricultural sector.’

e) Projects
 Projects are the building blocks of programs and are usually of shorter duration. It is a means by which national, regional, local, etc plans are made operational. Any kind of plan shows the general direction of action leading toward the achievement of set objectives. It is not enough for the purpose of implementation. This means the plan has to be elaborated or cut into ‘packages of action’.

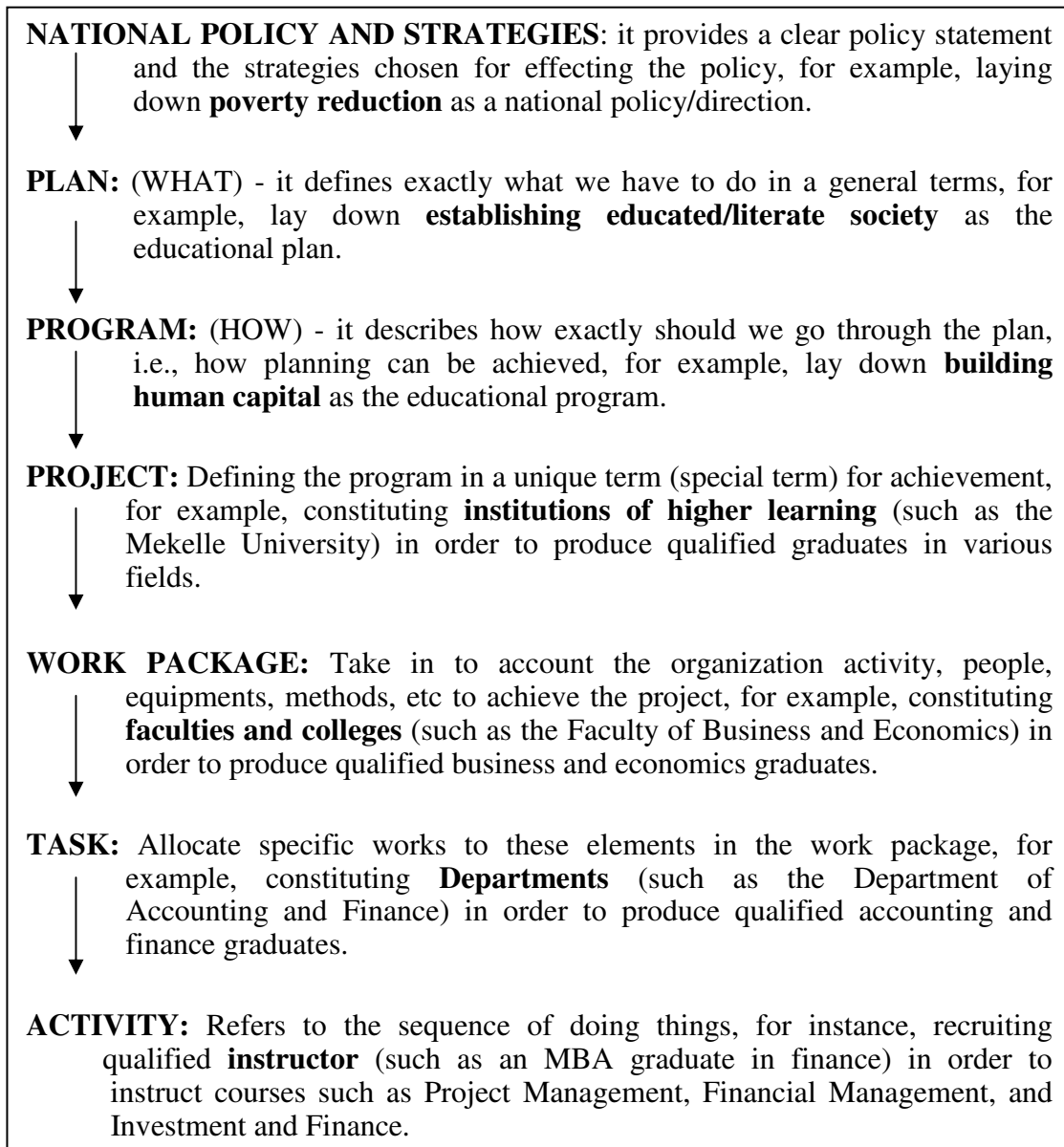
The package of action can be divided into two broad categories. These are:

- i. **Program-** which is the first step in plan elaboration and
- ii. **Project-** the second step in plan elaboration.

Program, which is a bigger package of action, composed of a number of projects aiming at attaining one or more related objectives of plan. **Project** on the other hand achieves goals, which lead to the accomplishment of specific objectives within program. The difference and similarities between projects and programs can be summarized in the following table:

	Project	Program
Difference	<ul style="list-style-type: none"> ▪ Is specific in objectives/purpose ▪ Has specific area/geographic unit ▪ Has specific target groups ▪ Has clearly determined and allocated fund ▪ Has specific life 	<ul style="list-style-type: none"> ▪ Has got general objectives ▪ May not have specific area ▪ May not have specific target groups ▪ May not have clear and detailed financial allocation ▪ May not have specific time of ending
Similarities	<ul style="list-style-type: none"> ▪ Has purpose/objectives ▪ Require input (financial, manpower, material, etc.) ▪ Generate output (goods and/or services) ▪ Operate over space and time 	

Exhibit 1.2: The Project Family Tree (Choudhury, 1988):



The project family tree thus enables to harvest a **total quality** through a **total quality management**. It portrays the **synergetic effect** of the different organs in a project to yield a total quality. There can be a synergy when there is an **interface, interdependence** and **interrelationship** among the system starting from an individual activity to the national policy. The national policy shall be clearly cascade down to the individual responsibility. Individuals too must plainly understand they have a **shared responsibility** that shall be accomplished to arrive at the national goal.

The project family tree also conveys the need for **empowering individuals** to discharge their shared responsibility. They are the major players in attaining the national goal. For example, the performance of an individual instructor has the major contribution for attaining the university's goal (**producing qualified graduates**), and hence the university management ought to **empower the line department** (the academic staff), among others, through supply of required logistics, creating an enabling academic and administrative environment.

1.6: PROJECT MANAGEMENT AND ROLE OF PROJECT MANAGER

1.6.1: PROJECT MANAGEMENT

What exactly is Project Management and what does a Project Manager do? According to the Project Management Institute (2004), a **project** is defined as a unique temporary endeavor, with a specific objective and a set of beginning and end; and **project management** as the application of knowledge, skills, tools and techniques to project activities in order to meet stakeholders' needs and expectations from a project.

1.6.2. ROLE OF PROJECT MANAGER

Essentially, project management is the methodology used to achieve the objective of a project. Therefore, who is a Project Manager? Project manager is the individual responsible for delivering the project, i.e., someone that has the necessary knowledge, skills, tools, and techniques to manage a unique endeavor and ensure that it meets its objectives. The Project Manager leads and manages the project team, with the authority and responsibility to run the project on a day-to-day basis (Chandra, 2006; Choudhury, 1988; William, 1996).

The project manager must do what ever is required to make the project happen, in legal terms. A project manager is like the manager of a baseball team. The project manager (Meredith and Mantel, 2006):

- Makes sure the objective is clear, it is understood by everyone on the team, all parties (stakeholders) have had input into the project, all the required work is understood, each team member knows what they are responsible for,
- Ensures project risks are identified and contingency plans have been created,
- Verifies all work is being completed on schedule, etc.

Figure 1.1 below illustrates all the key roles that could be involved depending on the scale and/or complexity of the project. Some of these roles could be combined and reporting lines shortened. For smaller/straightforward projects, the roles of Project Sponsor/Director and Project Manager may be combined subject to the condition that the person taking on the combined responsibilities possesses the requisite competencies, expertise, experience, and has the available time and resources. Where roles are combined, it is essential that delegations and responsibilities are clearly understood and do not overlap with other roles. This role description assumes that the roles of Project Sponsor/Project Director and Project Manager are separate. Where the roles are combined with no separate interface, the Project Sponsor/Project Manager reports direct to the Senior Responsible Owner (SRO), i.e., the project owner.

1.6.3. SKILLS AND ATTRIBUTES OF THE PROJECT MANAGER

The reason for organizing the task as a project is to focus the responsibility and authority for the attainment of the goals on an individual or small group. Meredith and Mantel (2006) have reported that the project form of organization allows the project manager to be responsive to:

- The client and the environment,
- Identify and correct problems at an early date,
- Make timely decisions about trade-offs between conflicting project goals, and
- Ensure that project personnel of the separate tasks that comprise the project do not optimize the performance of their individual activities at the expense of the total project, i.e., they do not suboptimize.

The selection of the project manager is thus a key appointment that can influence the success or failure of the project. As a single point of responsibility, it is the project manager who integrates and coordinates all the contributions, and guides them to successfully complete the project.

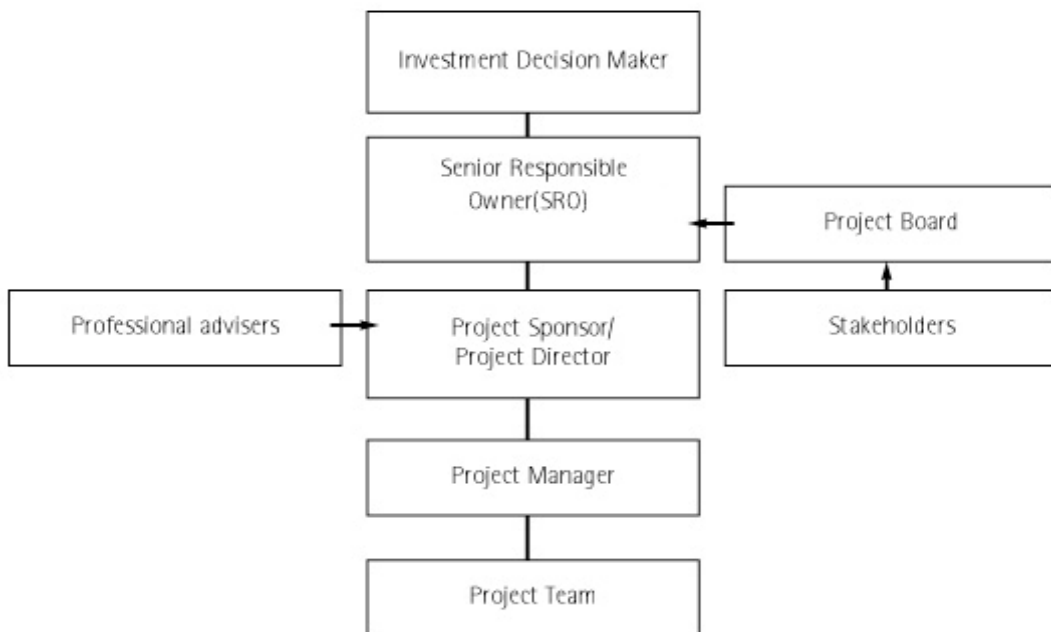
A story has it that when asked “**how do you motivate astronauts?**” a representative of NASA responded, “**we don’t motivate them, but we are careful about whom we select.**” The issue of motivating people to join and work creatively for a project is closely related to the kind of people who are invited to join. Some of the desirable project manager’s attributes are:

- Leadership ability, i.e., ability to get things done,
- Ability to anticipate problems,
- Ability to integrate the project stakeholders,
- Operational flexibility,
- Ability to negotiate and persuade,
- Understand the environment with in which the project is being managed,
- Ability to control (i.e., monitor and evaluate performances),
- Ability to manage with in an environment of constant change,
- Ability to keep the client happy (satisfied), etc.

The project manager should be able to:

- Apply standard project management approaches to the specific requirements of the project,
- Direct, manage and motivate the project team,
- Develop and maintain an agreed project plan and detailed stage plan(s),
- Tailor expert knowledge to meet specific circumstances,
- Plan and manage the deployment of resources to meet project milestones,
- Build and sustain effective communications with other roles involved in the project as required,
- Apply quality management principles and process, etc.

Figure 1.3: Project Organization- Project Management Reporting Structure



Source: Adapted from the Office of Government Commerce- OGC (2008)

Activity 1.6: Assuming that you are planning to recruit a manager for your assumed “Dairy Farming Project”, develop the selection criterion that merits a manager.

1.6.4: PROJECT MANAGER RESPONSIBILITIES

Berrie (2008) has identified the following list of responsibilities of a project manager. The project manager:

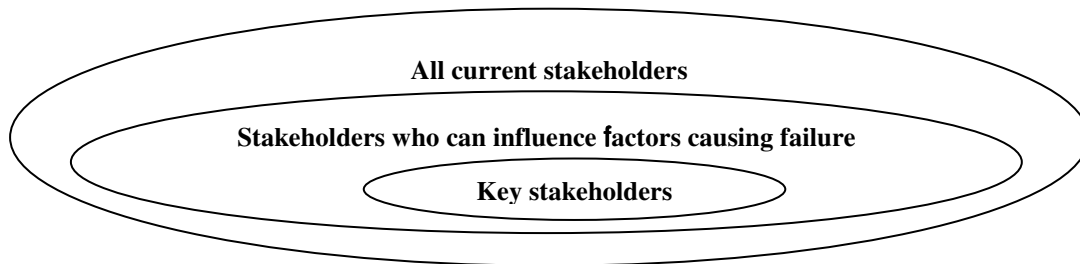
- Manages the project taking into account integration across all areas.
- Engages with stakeholders.
- Develops Project Plan.
- Directs project resources.
- Monitors and manages the project schedule, project budget and project risk.
- Deals with operational issues.
- Organizes steering committee meetings, including ensuring that minute will be taken.
- Reports to the steering committee, raising strategic issues.
- Prepares Project Status Reports and Project Change Requests for the steering committee.
- Ensures project meets requirements and objectives.
- Manages project team members.
- Negotiates and resolves issues as they arise across areas of the project and where they impact on other activities, systems and projects.
- Looks after the interests of the project team.
- Organizes and chairs project reference group meetings, as appropriate.
- Communicates project status to project sponsor, all team members, and other relevant stakeholders and involved parties.
- Maintains project documentation.

1.6.5: PROJECT MANAGEMENT AND KEY PROJECT STAKEHOLDERS

Project's Stakeholders are individuals or groups who will be impacted by, or can influence the success or failure of the project's work and/or its deliverables. Key stakeholders are, thus, a subset of stakeholders who have power to prevent the project from achieving its full set of objectives and potentially may cause the project to fail. For example, 'environmentalists' opposed to a major engineering projects. Some important stakeholders will never support the project and are focused on preventing it from proceeding (or in the example above, at least minimizing its impact on the environment). They may never see the project's output as good or desirable – for these, effective stakeholder management is about finding an effective, ethical way of neutralizing the threat they pose.

The term key stakeholder is used to identify members of the sub-group of stakeholders who have the power to substantially damage the project and may potentially cause it to fail. These groups are both important and influential/powerful; they may be individuals such as an important manager or entities such as a regulatory authority. If you fail to manage your project's key stakeholder community, your project is almost certain to fail: not failing, however, does not mean succeeding.

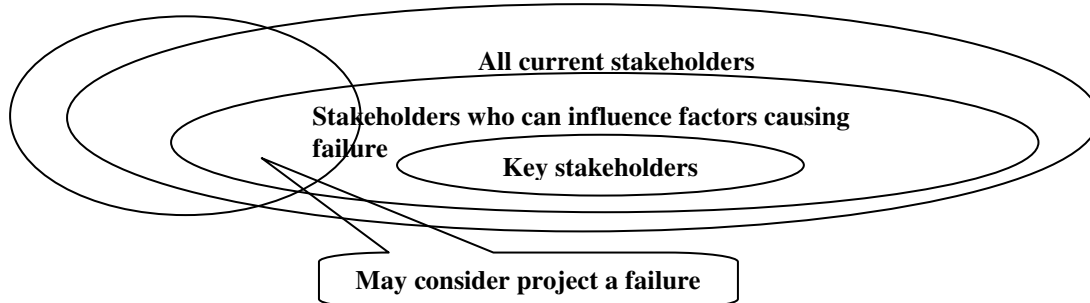
Figure 1.4: Project Stakeholders



Source: Adapted from Bourne (2009)

A large proportion of the project's key stakeholders will also have the power to influence the determination/perception of the project's eventual success. But in most circumstances, if the project is to be deemed successful, a large numbers of additional stakeholders will have to want to make use the project's output to realize the value/benefits the project was initiated to create.

Figure 1.5: Project Success and Stakeholders



Source: Adapted from Bourne (2009)

For the project to be deemed successful, most stakeholders must perceive it as a success. Achieving success involves significantly more than just completing the project on-time and on-budget.

1.7: PROJECT MANAGEMENT ENVIRONMENT

The project environment directly influences the project and how it should be managed. For project managers to be effective, they must have a thorough understanding of the project environment that may well be changing and so continually shifting the goal posts. The project environment consists of the numerous stakeholders and players that have an input or are affected by the project. All must be managed as any one person could derail the project. Consider the following (Chandra, 2006; ICMR, 2007):

- Stakeholders (all interested parties),
- Client/Sponsor's requirements,
- Company's organization structure,
- Market requirements,
- Competitors,
- New technology,
- Rules and regulations,
- Economic cycle, etc.

Activity 1.7: Explain in brief how a government rules and regulations influence a development project by giving an illustration.

1.8: PROJECT ORGANIZATION STRUCTURE

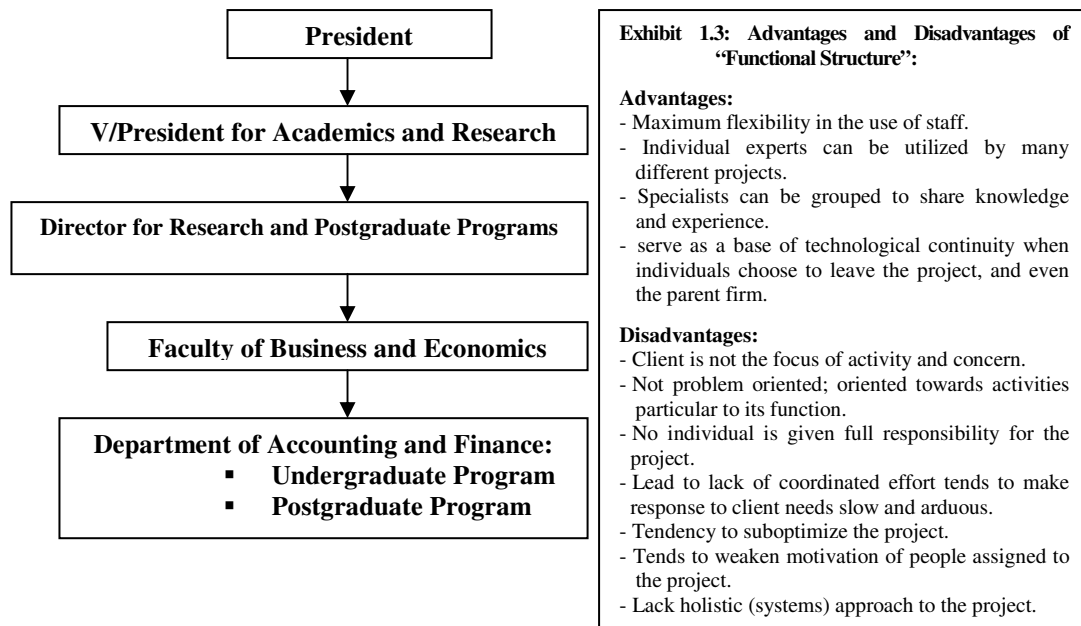
Whether a firm is undertaking a few occasional projects or is fully project-oriented and carrying on scores of projects, any time a project is initiated, the following three organizational issues immediately arise. A decision must be made about how

- To tie the project to the parent firm (**inter-organization**),
- To organize the project itself (**intra-organization**), and
- To organize activities common to other projects (**across-organization**).

This section focuses on the interface between the project and its parent organization, i.e., how the project is organized as a part of its host. Meredith and Mantel (2006) have described the following three major organizational forms that are commonly used to house projects. These are:

- The project as “**part of the functional organization**”, for example, if the Master of Finance and Investment is placed under the Department of Accounting and Finance.

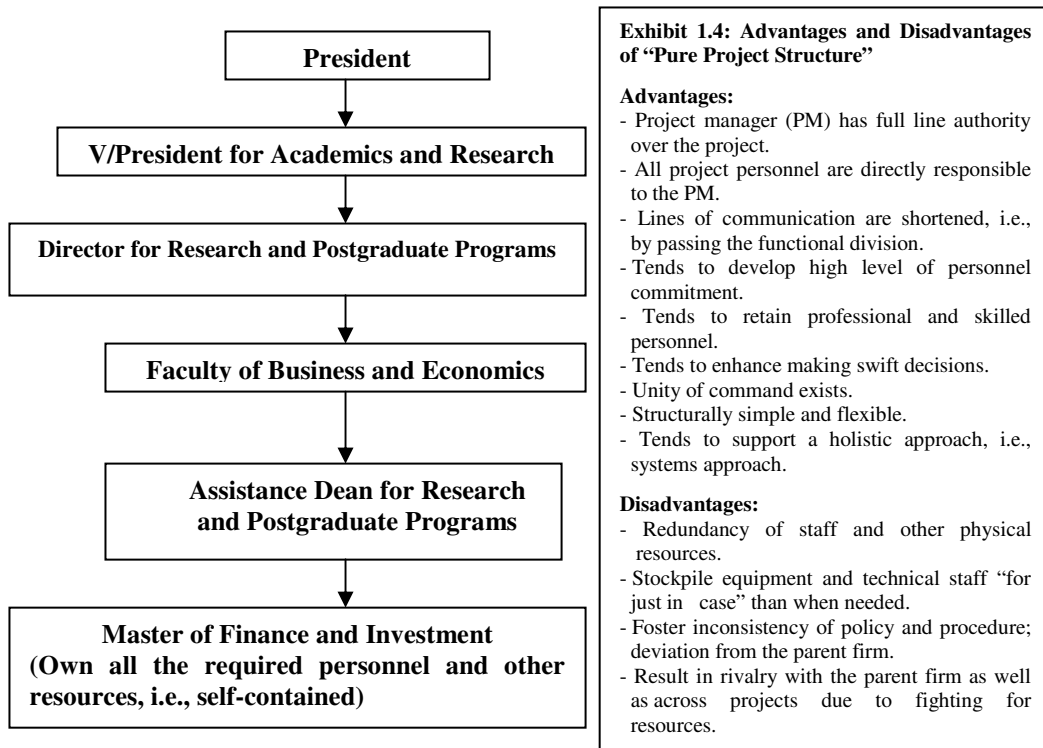
Figure 1.6: Project as Part of Functional Organization



The “part of functional division project structure” is cost-effective and cost-efficient, but inefficient as well as ineffective for attaining project objectives in terms of performance and time due to lack of line authority over personnel and other resources.

- As the “**pure project organization**”, for example, if the Master of Finance and Investment is separate from the Department of Accounting and Finance; i.e., becoming **self-contained** unit with its own technical staff, its own administration, and tied to the Faculty of Business and Economics by the periodic progress reports and oversights; and

Figure 1.7: Pure Project Structure



The “pure project structure” leads to effective attainment of project objective, but the project will be cost-ineffective and cost-inefficient due to the redundancy of personnel and other resources; it is self-contained.

- The “**matrix organization**”, i.e., a combination of the functional and pure project organization structures, for example, when the Master of Finance and Investment is functionally operated by the Department of Accounting and Finance and the project manager is reporting to the FBE’s Assistance Dean for Research and Postgraduate Programs.

Nowadays project become more complex, meeting budgets become more important, delivering the project on time is more crucial and working with many disciplines, departments or companies become a fact of life. So as of necessity, **project focused** organization structures are started to develop. This is an organization structure with the project manager as the **single point of responsibility** with an autonomous authority over a pool of resources.

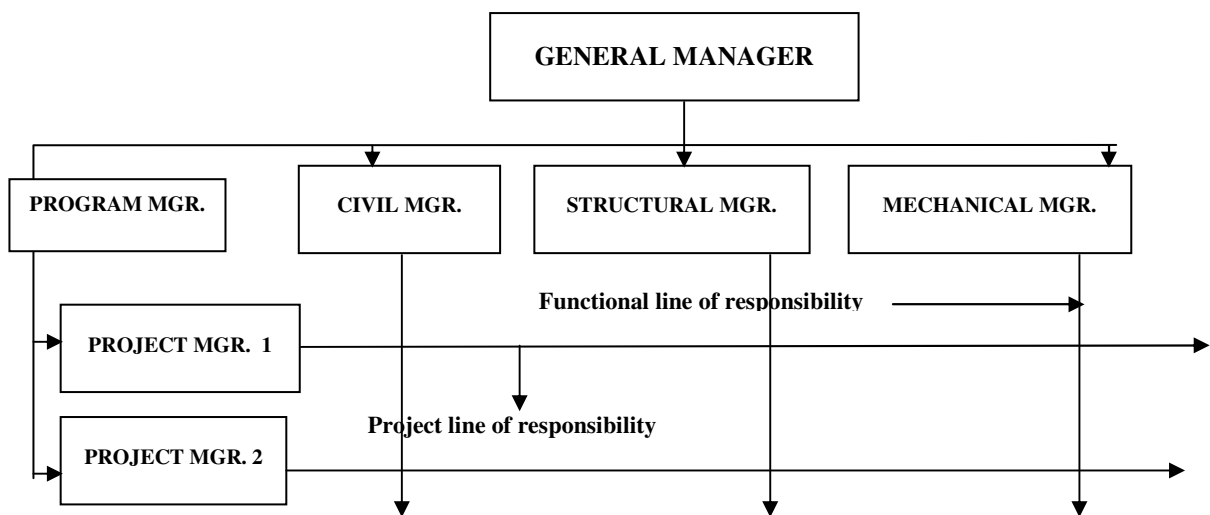
The project approach is to assign responsibility to one person who would work on the project full-time through the project life cycle from initiation to completion. This new organization structure where the project lines of responsibility and authority overlaid the functional lines of responsibility and authority become known as the '**matrix project structure**'. This enabled organizations to work on many projects at the same time, share resources, address scope of overlap and under lap, and most importantly have one person dealing with the client.

For example, when there are more than one faculties and colleges in a given university campus, it can have a well organized and staffed campus administrative support services on a pool basis. It might not be economical to constitute an independent administrative service package for each faculty and college. The matrix structure is also

in favor of a well organized, equipped, staffed, responsive and reliable pool administrative service. This enables to effectively and efficiently administer scarce resources and deploys resources towards the academic teaching and learning by avoiding duplicated administrative costs.

Delegation/Decentralization does not mean fixing independent administrative sections here and there; it is rather empowering the academic faculties and colleges by delegating the required authority to make decisions on their part to discharge their shared responsibilities; say power for directly commanding the finance section to effect payment related to the faculty. Let the campus administrative services such as administrative and finance, library, registrar and dean of students functionally accountable for each faculty's and college's day to day administrative support service requirements, let the faculty and college officially evaluate the support services, and take both corrective and preventive measures. Then, the administrative section will have double accountability as the academic staff does (accountability for immediate boss and students). They are accountable for their immediate bosses for periodic reporting and accountable for the colleges and faculties for their day to day support service performance.

Figure 1.8: Matrix Project Structure



The matrix project structure leads to efficient and effective attainment of project objectives in terms of performance, time and cost.

Exhibit 1.5: Advantages and Disadvantages of “Matrix Structure”:	
Advantages:	
-	The project is the point of emphasis.
-	Access to the entire reservoir of technology and expertise in all functional divisions.
-	Reduce duplication of technology, personnel and other physical resources.
-	Rapid response to client needs.
-	Permits operational flexibility.
-	Employs holistic approach, i.e., systems approach.
-	Ensures consistency with the policies, practices and procedures of the parent firm.
Disadvantages:	
-	Brutal infighting to avoid blame if the project is a failure, because power is balanced between the project manager (PM) and the functional heads.
-	Infighting among project managers during movement of resources from project to project for ensuring success for their projects than the total system that optimizes organization wide goals.
-	Success is doubtful for a PM without strong negotiating skill, because the PM controls administrative decisions and the functional heads control technological decisions.
-	Lack unity of command because the project personnel have at least two bosses, i.e., the functional heads and the PM.

1.9: MANAGEMENT-BY- PROJECT

Meredith and Mantel (2006) have reported that the process of managing organizations has been impacted by three revolutionary changes since 1990s. These are:

- Replacement of traditional and hierarchical management by consensual management,
- Adoption of the “systems approach” (some times called “systems engineering”) to deal with organizational or technological problems, and
- Establishing projects as the preferred way to accomplish goals, respectively.

The basic purpose for initiating a project is to perform a specific goals. Project is a tool for planning, analyzing, designing, implementing and controlling a unique and non routine job. Many organizations are changing in nature as more of them are accomplishing their business through projects. Even their routine organizational tasks can be managed by employing the project techniques. For example, any government organization undertakes purchase of office supplies every year for accomplishing its planned annual activities. This kind of purchase is not a project since it is a routine and continuous activity of an already established organization. But, for effective and efficient performance of the purchase of these supplies, the particular government organization can apply the series of successive processes in a project.

Management-by-project:

- Integrates all functional divisions,
- Enhances functional trade-offs,
- Ensure that the proper knowledge and resources are available when and where needed, and
- Ensure that the expected results are produced in a timely, cost-effective manner.

This can help ensure good governance by preventing anticipated flaws and by fixing accountability on failures that might prevail in the form of deviations from quality specification, committed budget, delay in work schedule and negative service disconfirmation.

Some government office managers used to say “**government purchase is all about purchase of low quality at cheap price**”. This is absolutely wrong because quality is not what is paid; it is rather **how the prepared purchase specification is fit for purpose**. This specification document is prepared before the vendors’ invitation for offering their prices. Those vendors who do not appropriately fill the specification document shall be dropped first, the candidates will be only the legible ones, and then subsequent selection of vendors will be made based on who offers the specified quality at the cheapest price. So, government is quality-seeker, buying quality at the lowest price possible, like any private organization. The purchasing committee decision statement must also state that “**the XYZ organization is selected because it has filled the bid document as per the instructions, met the quality specification, and offered the cheapest price**”.

There are times, however, the purchasing committee put its decision statement as “**the XYZ organization is selected by quality**”, at a higher price than the least offer. This is totally dishonesty because the committee is not entitled to revise and set new quality specification other than checking confirmation of the filled specification document against the original specification. Besides, Vendors are not competing for setting a new specification instead they are competing on the price they can offer for the already given specification. Moreover, it is disappointing when you think of the “**persocracy**”

(i.e., the individual's personal practices that are officially overriding the bureaucracy) that is unnecessarily obstructing service solutions/performances.

Employing the project techniques permit a steward office manager to fix such “**solution-crimes**” along with the “**Snakes**”. All the office activities such as purchase, maintenance, recruitment, training and development are actions either for searching, giving or accepting solutions. There is a **solution-crime** when there is a deliberate do away with the solutions and those crime actors and actresses are the **Snakes**. The management-by projects approach, thus, encourages:

- Organizational flexibility,
- Decentralized management responsibility,
- Holistic view of problems, i.e., systems approach,
- Goal-oriented and focused problem solution process for seamless solutions,
- Enhances good governance through transparency,
- Builds human capital in the process,
- Boost employees' job, organizational as well as psychological commitment, etc.

1.10: MAKING CHANGE HAPPEN THROUGH PROJECT MANAGEMENT

A project of any significant length will necessarily deviate from its original plan in response to circumstances. This is fine as long as the change is understood. If the change is not managed but happens at a whim, it is no longer a project, it is anarchy.

Change management is a way of assessing the implications of potential changes and managing the impact on your project. For example a change in client requirements might mean a minor fix or it might mean a complete re-write of the design. Change management gives you a process to evaluate this and introduce the change in a controlled fashion.

The basis of change management is to have a clear process which everyone understands. It need not be bureaucratic or cumbersome but it should be applied universally and without fear of favor. According to Jenkins (2008), the basic elements of a change process are:

- What is under change control and what is excluded?
- How are changes requested?
- Who has the authority to approve or reject changes?
- How decisions upon approval or rejection are documented and disseminated?
- How changes are implemented and their implementation recorded?

The process should be widely understood and accepted and should be effective without being bureaucratic or prescriptive. It is important for the project team to be seen to be responsive to client needs and nothing can hurt this more than an overly-officious change control process. Change is inevitable in a project and while you need to control it you do not want to stifle it. If you have a flexible change request process, team members can be encouraged to use it to seek additional information or clarification where they feel it would be useful to communicate issues to the whole project team.

Since change is inevitable, you need a fluid way to handle the inputs to your project. It is important that the inputs to your project, your requirements and your design, are able to handle change and evolve over time. If your inputs are static, unchangeable

documents, then you are going to be constrained by their inability to keep pace with changing circumstances in your project.

To make change management easy you need a simple method of tracking, evaluating and recording changes. This can be a simple database or log but in large projects it has evolved into a customized information system in its own right. Jenkins (2008) reported that the information system needs to be able to handle:

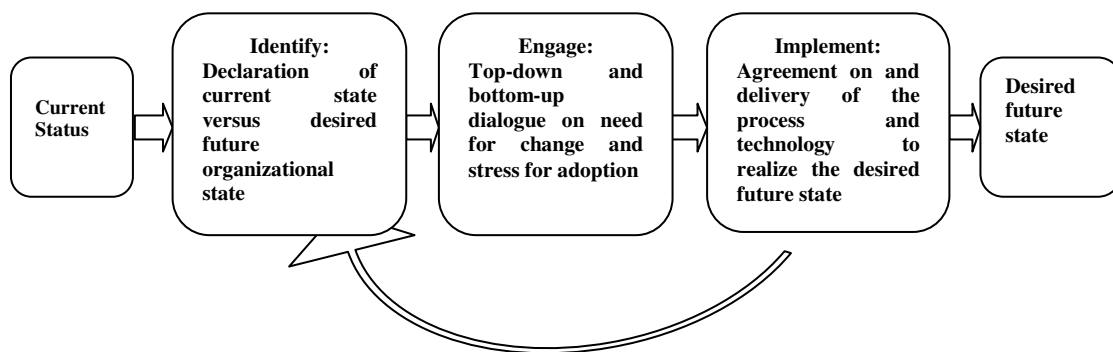
- Logging requests for changes against products and documentation
- Recording and managing the priority of a particular change
- Logging the decision of a change management authority
- Recording the method and implementation of change
- Tracking implemented changes against a particular version of the product or document

The more structured a system the more secure the change control process, but obviously the more overhead. A balance must be struck between the enforcement of proper procedure and responsiveness of the system. A simple, well understood change management system can often be directly used by stakeholders to log, track and review changes and their approval. In many projects the change management system can be linked to (or is part of) a defect tracking system. Since resolution of a defect is, in effect, a request for change, both can often be handled by the same system.

1.10.1: CHANGE MANAGEMENT LIFE CYCLE

Change management is a cyclic process, as an organization will always encounter the need for change. There are three phases in the Organizational Change Management Life Cycle: Identify, Engage and Implement (Gilbert, 2009).

Figure 1.9: The Change Management Life Cycle



The elements of change (processes, technology and people) and the phases of the Organizational Change Management Life Cycle are closely linked, and their intersection points must be carefully considered. By paying close attention to how people are engaged in each phase, an organization can manage that change to adapt to any business or economic condition.

a. Identify

In the Identify stage, someone within an organization- typically a senior executive- spearheads an initiative to change a current process. A single voice at a very high level is often the first step in establishing the need for change. This need is then presented to the organization with a general description of the current state of affairs, offset by a high-level vision of the desired future state.

While it seems obvious, identifying the change is an absolutely fundamental first step in successful change adoption. It is important that the changed condition be described in a common, consistent language. However, organizations often fail to identify and communicate the need for change in a way that is understood and embraced by people working at all levels of an organization- from the executive suite to the individual workstation. Many leaders do not adequately consider how a proposed change (or even the rumor of one) may be received- at an intellectual, emotional and neurological level- by the people it will impact the most. To ensure successful change, organizations should introduce a change effort during the Identify stage using the following techniques:

- **Get their attention**

Since change is disturbing and distracting to human beings, it's important to get their attention about the change. Getting people out of their daily routines- at an off-site location, if possible- helps them create a shared sense of urgency for change and concentrate on the change message, thereby internalizing it more deeply.

- **Align their disturbances**

Neurologically speaking a disturbance is a conflict between a person's current mental model (the way they think about something) and the mental map needed to operate in a changed state. To align disturbances means to create a common disturbance among the minds of the people in the organization- to create agreement between the gap that people have between their individual current mental model and the mental model needed to operate in a changed state. When these gaps aren't in alignment, everybody will respond to the change differently, and won't be able to agree on the direction and intent of the organizational response needed. An important technique for aligning the potentially broad spectrum of disturbances is for leaders to craft and continually communicate a compelling vision of what the future will look like when the change is implemented.

The best way for leaders to make a compelling case for change is to consider the need for change at every level in the organization, not just at the top tier. The top-level need for change is almost always driven by bottom-line goals, and does not touch the day-to-day work experience of the organization's staff. For instance, a financially oriented statement, such as "our organization must realize a 20 percent reduction in operating expenses" will likely be met with fear, uncertainty and skepticism in some levels of the organization, and with ambivalence and apathy in other levels. Ultimately, it is imperative to align these varying disturbances with a clarifying vision. Some additional people-related items to consider when identifying change opportunities include:

- Possible frustrations in performing (new) work
- Clear job definitions
- Job definitions and metrics that match the process
- Understanding of the end-to-end process
- Cultural dynamics within the organization that may inhibit people from moving to a new, changed state

b. Engage the People

Once the need for change has been identified and communicated, the next critical step is to engage people in planning for the organization's response to the change.

Successive levels of the organization must be included in a dialogue to help design an implementation plan. People within an organization must be allowed an opportunity for intellectual, emotional and psychological reaction to the desired change. Providing this opportunity enables people to become accustomed to the idea of change and to align their thinking in ways that will help both identify potential problem areas and contribute substantively to process improvement.

Consider this example: In a recent process change effort, an external consultant developed a new process, down to a very detailed level (with little input from the organization, and many requirements from executives), and proudly handed over the process design and documentation to the team responsible for implementing the new process.

The results were not surprising. The user team passively accepted the process, and then aggressively refused to implement it. The user team had no energy or enthusiasm to implement something in which it had no emotional buy-in. In fact, team members told executives in the project post-mortem that they actively sabotaged the new process because "the consultants developed the process, even though we are the experts."

General George Patton of the U.S. Army is quoted as saying, "Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity." Wise leaders know that successful change adoption depends on engaging the hearts and minds, as well as the bodies, of the people facing a changed condition. Organizational leaders need to engage the energy and enthusiasm that comes from people having their own insights, for this is where true commitment to change comes from, and where the ownership of results are truly developed.

One technique to encourage people's adoption of a change is to conduct organization-wide response/adoption alignment workshops. When practiced effectively, these sessions allow people to contribute their own ideas about how a deliverable should be used within the organization. Once these contributions are aligned- through multi-party conversations (where much thrashing may occur!)- an aligned approach for managing and adapting to the change will emerge.

When reactions have been aligned and individuals within an organization are asked to be involved in responding to change, typical human behavior moves to addressing the problem- creating a desired direction to facilitate change.

The implementation strategy for responding to the change is then developed at a high level. The people who will be executing the strategy, as well as the people who will be impacted by the strategy, should be included in the strategy development. This high-level strategy is important for aligning and clarifying the intent of the change, as well as for establishing a direction that the change implementation will take. The strategy needs to be seen by all as a flexible plan so that the organization can adapt to changing conditions once implementation of the strategy is initiated.

c. Implement the Change

In the Implement phase, change strategies developed during the Identify and Engage phases are translated into tactics, or actions, for moving toward the desired future organizational state. Here again, people are critical to how processes and technology are created and implemented. They have direct, daily experience with these processes and technology and, consequently, they are most knowledgeable about how these components must be customized for the best results.

Most organizational change failures occur because insufficient time and attention was given to the first two phases of the life cycle: Identify and Engage. On the other hand, most organizations spend the majority of their time, effort and attention here, in the Implement phase. But, without the proper alignment of people's disturbances and their response to a changed condition, successful adoption rarely occurs.

During implementation, employees throughout the organization need to remember why they are working so hard on implementing a change. Therefore, change leaders should continually remind people, using multiple media (formal e-mails, progress celebrations, informal conversations) what the change is and why it is so important.

Additionally, organizational leaders should ask themselves the following people-related questions to help ensure successful implementation:

- Does the individual have the ability or desire to work in the new environment?
- Are additional skill sets needed to transition to the new job?
- Are changes to job descriptions needed?
- Are job grades or pay impacted by this change?
- Does the change impact short-term productivity? If so, will additional support be needed to ensure business success?

If organizations successfully complete the first two phases in the change management life cycle, the implementation phase becomes essentially a monitoring activity for leaders.

They should assure that:

- Change-oriented tasks are being accomplished as planned.
- Energy and enthusiasm are present.
- Alignment still exists among the people.

1.10.2: ELEMENTS OF CHANGE

In every organization, regardless of industry or size, there are three organizational elements that both drive change and are affected by change (Gilbert, 2009): Processes, Technology and People.

Technology supports the processes designed to respond to changes in market conditions. Ultimately, however, it is the people who must leverage these processes and technology for the benefit of the organization. Let's look briefly at how each of these elements is affected by organizational change.

a. Process

Business processes are defined by process maps, policies and procedures, and business rules that describe how work gets done. These processes are redesigned or realigned as new prospective customers or better ways to provide service to existing customers (both internal and external to the organization) are identified. This drives the adoption of new technology.

b. Technology

Technology ensures greater organizational efficiency in implementing the changes. It is a means to process data with greater accuracy, dependability and speed. Therefore, essential to any change process is a plan for introducing and systematizing the technology required to execute the intended changes.

c. People

Generally, organizations excel at designing new or improving existing processes. They also do well at identifying or developing technology to realize the power of new processes. However, most organizations fail to focus sufficient attention on the role people play in the processes and technology used to accomplish the desired organizational change. As noted below (see **Section 1.10.4**), the overwhelming percentage of organizational change efforts fail because people are not sufficiently considered at the outset of the initiative. It is the people within an organization, after all, who are responsible for developing and implementing new processes, which will in turn require new technology.

It is also the people who must specify, recommend, purchase and use the new technology. At the most basic level, people must acknowledge and buy into the need for change. An organization cannot even begin to introduce change unless its people understand and support the reasons driving the change. This acceptance of change is known as the first step in human transition.

1.10.3. PRINCIPLES FOR PROJECT SUCCESS

Project is the tool for making change happen. Jose (2009) has discussed on what he called “the Five Principles for Project Success”: Purpose, Planning, Tracking, demo and Consistency. When any of these principles are violated, a project is headed for trouble. Conversely, if a project is in trouble, reviewing these principles is critical for recovery.

a. Purpose

The project purpose should be defined up front and everyone should know it. Everyone involved in a project at every level should always know the project purpose: who cares about a project and why is it important. People should know the project drivers (e.g., cost, quality, target date, feature set, stability, usability, performance, flexibility, accessibility, etc) and how the drivers are ranked. This is the only way to rationally make tradeoffs within and across projects.

The project purpose is frequently overlooked because we tend to focus on the work that needs to be done and often get started on it without asking why. When this happens, we tend to work on tasks we want to work on, not necessarily what’s most important for the client/customer and stakeholders. At some point (when the budget or schedule gets tight), we’ll have an emergency meeting to figure out what should be done and finally the project purpose will be recollected or even spelled out for the first time, but, too late. There won’t be room to recover.

b. Planning

The most famous quote on planning is probably from Eisenhower: “Plans are worthless, but planning is everything”. When engaged in planning, we’re considering options. We think through risks and how we might address them. We lay things out, we make assumptions and we make choices. At the end of this we have a plan. However, no matter how thorough our plan or how much thought we’ve put into it, the plan can only reflect what we know at a given point in time. Things change. We may run into a set of unanticipated problems or perhaps the risks we did consider didn’t really have the impact we feared. When this happens, we should adjust the plan. We should re-plan. Planning is something we should do throughout a project. When a plan is no longer useful, we should draft a new one.

Without planning, projects will be left to chance. Risks will come as a surprise and quickly derail a project. People will be constantly shooting from the hip, making decisions based on urgency instead of value, reacting to events instead of anticipating them.

c. Tracking

To make rational decisions about projects, we need to track project data. This isn't something we get from chatting with someone. When we ask "How are things going?", we'll get a response like "Pretty good. I think we're going to be done with this next phase soon". What does that mean? What does that tell us? When someone says something like that, I hear "We're not done yet". We need a finer level of status than that. We should be able to answer questions like this at any point during a project:

- Is the project running late? By how much?
- Is the project over budget? By how much?
- Which tasks can be started now? Are any of them late off the bat?
- Is the project resource-bound? Where are the bottlenecks?
- What are people working on?

If we don't have tracking, we won't know if our projects are in trouble until the end. Key decisions will be delayed. Teams will miss important dates. The sense of urgency that should have come earlier in the project will come too late. Tracking project data can be straightforward and easy if we have the right tools.

d. Demos

Demos are the real measure of progress. If we can show something working, then we've actually done something. If we can't demo anything, then we really don't have anything of value. Demos are great because they expose assumptions. They ensure that details are looked after. They get everyone on the same page, something especially important when there are several teams involved.

If we don't do demos, teams that can work separately will work in isolation. Work won't be integrated until the very end of the project. Everyone will feel their part is on track when, in reality, much of the work is yet to come. When integration finally does arrive, it will take much longer than everyone expects. There will be unanticipated rework, cost, and stress. Demos are something we should always plan for in our projects.

e. Consistency

Consistency is about predictable execution. It's about discharging work efficiently and having clean handoffs across teams. When we have consistency, our organization runs like a well-oiled machine. This can only happen when roles and responsibilities are clear, when processes are well-defined, and when people have the set skills to play their roles.

If we don't have consistency, we'll waste a lot of time reinventing process on the fly. Tasks will be dropped, especially across team boundaries. There will be gaps in process, gaps in task assignments, and gaps in set skills. Execution will stall and be unpredictable.

To become consistent, we need to think through our processes and capture them in some form. Charts are a good tool to use here because they force us to think not only about what needs to be done, but also who should be responsible for it and what sequence the work should follow. It can be an interesting exercise to get people together to sketch out a process because it will quickly become obvious that everyone had a slightly different view of the roles and responsibilities. Getting clarity early on the roles and responsibilities improve consistency of execution.

1.10.4: MAKING CHANGE HAPPEN

According to Dwyer (2007), 70% of all change management projects are considered to be failures. He claimed that the critical factors for change management success or failure are fairly simple. He has also explained the following six factors that impact on project success.

The first factor is to **have a group of people at leadership level believe that change is required**. More than that, they must believe that “change management” is required. If these factors are not evident then failure is assured.

Understanding that major change is required is not enough. Developing a project plan which includes changes to processes, policies and infrastructure that does not include a plan to manage the change at a people level is not enough.

The second requirement is that **the people undergoing change must have a reason to believe the change is necessary**. They need the big picture painted for them to understand what benefits the organization will gain from what many people will consider as the shared pain of change.

The big picture must be compelling, giving as many people in the organization the desire to embrace the change even if it is difficult. Organizational change for organizational change’s sake is likely to fail to deliver change.

The third requirement is that **individuals must know how the change will affect them as individuals**. Never forget the greatest motivational tool is to be able to respond to the question, “**What’s in it for ME?**”

For most individuals in most organizations, motivation is about achievement, recognition, the work itself, responsibility, advancement and personal growth. So, be sure that the change message addresses as best it can the motivational opportunities for people.

The fourth requirement is to “**tell them early, tell them often**”. Do not be surprised how many times the message needs to be repeated to the same people. Human beings filter information based on their emotional state, their previous experiences and their thinking styles. In a time of significant change people are often in emotional turmoil and will filter severely whatever they are told.

Tell people the compelling reason for the change, the plan for change, the progress of the plan for change including any early wins and their role in change, again and again as the project is implemented.

The fifth requirement is to **be honest about the change**. Sugar coating change (glazing) is seen as being untrustworthy and will adversely impact the ability to communicate with the very people who have to embrace and implement the change.

If there is any bad news say so. If jobs are going to be lost, say so. If there are going to be challenges with the change, say so. If people have to re-skill, say so. If the targets are going to become much tougher, say so. If an insignificant advantage will accrue to people, do not make it seem more significant than it is.

If we are honest about change and we don’t know about some of the implications, we may have a significant number of people actually believe us. When we ask for help in making the change work, we may get a positive response. If we are dishonest, even our best workers will treat us like one as good-for-nothing.

The sixth requirement is to **utilize project management processes and skills**. For those involved in change management who do not use project management processes and skills, the simple advice is, “If I were you, I would not have started there”.

Project management processes and outputs play a big part in both planning and communicating the changes anticipated. They assist in risk management, contingency planning, change control, resource management, prioritization and post implementation review of the change.

Far too many organizations embark on change by impulse. They do not plan change. They do not estimate the resources required by change. They do not plan the precursors to events required to make the change happen. They do not understand the risks and plan the contingencies. They usually reap the rewards with a failed change project.

Managing change is not easy. However, it is not as difficult as a seventy percent failure rate would make it seem. It needs to be taken as seriously as managing the finances of an organization or the safety of an organization.

Managing change requires a leadership team with project management, communication and analytical skills with a high degree of results orientation. The latter is important as when a journey of change is embarked upon, the environment in which the change is being implemented immediately changes. A changing environment often calls for changed tactics to achieve the same result. More than that it requires the leadership team to have a vision for what the change can bring to the organization and to individuals and a passion to make that change happen.

1.11: ETHICS FOR PROJECT MANAGEMENT PROFESSION

Ethics refers to the moral principles that govern the actions of an individual or a group; moral judgment about what we are doing is right or wrong. Is it possible that ethics really is in the mind of the doer? Most companies have a code of ethics for their employees to read and sign. Do they think signing a piece of paper will make those of us with questionable morals magically ethical? Or is it more like the police telling someone “anything you say can and will be used against you in the court of law”?

1.11.1: CATEGORIES OF ETHICS

According to Cutting (2007), there are four general categories of ethics: Equality, Truth, Honesty and Integrity. How should I act tomorrow based on these four simple words?

a. Equality

Individuals should be treated on their own merit. We have come a long way, but unfortunately we can still find many examples where people aren't treated equally. My responsibility is to act professionally regardless of differences (race, sex, politics, religion, etc.). I don't have to agree, disregard, authenticate or rejoice the differences, but I had better not use it to separate people out for different treatment.

b. Truth

Watch what we say. There is that sticky place between the “truth” and the “whole truth” that allows for a lot of wiggle room. The closer we can bring these two together, the more ethical we are. If I had a truth meter on my communications, how close to a 10 would it read? Do my status reports cover things up? Are defects reported accurately in my test results? How big is the fudge factor in my financial statement?

c. Honesty

Our conduct toward others should be fair and not deceptive. If I have to engineer a situation to make me look good, I am probably stretching my honesty credibility. What is the motivation behind my action? Is it to make me look better than my rival? Do the right thing for the right reason.

d. Integrity

Uninformed or susceptible people are easy targets. Integrity is not taking advantage of them. It is doing what I said I would do. It means refraining from calling in sick with an “eye” problem because I “can’t see” bothering to go to work today.

Ethics can all be boiled down to the Golden Rule: “**Do unto others as you would have them do unto you.**” It doesn’t matter if you can do it without getting caught. Ethics are a personal thing. I am personally responsible for my ethics and am expected to treat others and my company properly regardless of how I am treated in return (ICMR, 2007).

1.11.2. CODE OF ETHICS FOR PROJECT MANAGEMENT PROFESSION

Project Management Professionals, in the pursuit of the profession, affect the quality of life for all people in our society. Therefore, it is vital that Project Management Professionals conduct their work in an ethical manner to earn and maintain the confidence of team members, colleagues, employees, employers, clients, and the public. The term "ethics" is commonly used to refer to the moral principles that are accepted by the majority of the members of society.

Brown (2009) has reported the following list of some commonly known ethics in Project Management. Project Managers should abide to this list at all times:

- **Treat the money like it’s your own.** If you make financial decisions as if it were your own money you’ll always make the best decisions for your client.
- **Care for your community.** Your project affects a diverse range of stakeholders. Know who they are and how you’ll change their lives. Know how you’ll explain your project to your families and friends.
- **Account for the full product life cycle.** Today’s new product is tomorrow’s landfill. Understand the true cost of ownership by full lifecycle costing, from sourcing materials to disposal.
- **Do the best you can first time around.** When you turn up for work, remind yourself that you are there to do the best job you can. Be proactive, be creative, and be efficient.
- **Deal fairly with your suppliers.** If you can’t deal fairly and openly with them during the project phase of the product, what chance does the client have of working with them during the operations phase?
- **Honesty all the time.** Never lie by omission, never lie by vagueness, never lie by delaying, never lie by clutter, never lie by jargon: just never lie.
- **Help others along.** Projects are not just delivered by teams. They are delivered by communities, workforces, and professions. You have a place in these groups; there is always someone to learn from and someone to help along. Share what you know and receive help when you need it.
- **The Platinum rule.** Don’t just treat others how you want to be treated, treat them how they want to be treated.

The code of ethics for the project management profession that have been laid down by the Project Management Institute includes:

- i) Ethical standards for upholding personal and professional conduct,
- ii) Ethical standards at the workplace,
- iii) Ethical standards pertaining to the project manger's relationship with employers and clients, and
- iv) Ethical obligations towards society.

The following four Articles present the “Code of Ethics for the Project Management Profession” extracted from the Project Management Institute (2004).

Exhibit 1.6: Code of Ethics for Project Management Profession

Article 1: Project Management Professionals shall maintain high standards of personal and professional conduct and:

- 1) Accept responsibility for their actions.
- 2) Undertake projects and accept responsibility only if qualified by training or experience, or after full disclosure to their employers or clients of pertinent qualifications.
- 3) Maintain their professional skills at the state of art and recognize the importance of continued personal development and education.
- 4) Advance the integrity and prestige of the profession by practicing in a dignified manner.
- 5) Support this code and encourage colleagues and co-workers to act in accordance with this code.
- 6) Support the professional society by actively participating and encouraging colleagues and co-workers to participate.
- 7) Obey the laws of the country in which work is being performed.

Article 2: Project Management Professionals shall, in their work:

- 1) Provide necessary project leadership to promote maximum productivity while striving to minimize cost.
- 2) Apply state of the art project management tools and techniques to ensure quality, cost and time objectives, as set forth in the project plan, are met.
- 3) Treat fairly all project team members, colleagues and co-workers, regardless of race, religion, sex, age or national origin.
- 4) Protect project team members from physical and mental harm.
- 5) Provide suitable working conditions and opportunities for project team members.
- 6) Seek, accept and offer honest criticism of work, and properly credit the contribution of others.
- 7) Assist project team members, colleagues and co-workers in their professional development.

Article 3: Project Management Professionals shall, in their relations with their employers and clients:

- 1) Act as faithful agents or trustees for their employers and clients in professional business matters.
- 2) Keep information on the business affairs or technical processes of an employer or client in confidence while employed, and later, until such information is properly released.
- 3) Inform their employers, clients, professional societies or public agencies of which they are members or to which they may make any presentations, of any circumstances that could lead to a conflict of interest.
- 4) Neither gives nor accepts, directly or indirectly, any gift, payment or service of more than nominal value to or from those having business relationships with their employers or clients.
- 5) Be honest and realistic in reporting project quality, cost and time.

Article 4: Project Management Professionals shall, in fulfilling their responsibilities to the community:

- 1) Protect the safety, health and welfare of the public and speak out against abuses in these areas affecting the public interest.
- 2) Seek and extend public knowledge and appreciation of the project management profession and its achievements.

1.12: CHAPTER SUMMARY

A project is a group of unique, inter-related activities that are planned and executed in a certain sequence to create a unique product or service, within a specific timeframe, budget and the client's specifications.

Some of the characteristics of the tasks that qualify to be a project are: uniqueness, specificity of goal, sequence of activities, specified time and interrelatedness.

Projects are carried out under many resource constraints (time, cost and material resources) and their success depends on the ability of the manager to manage these constraints effectively.

Project management is the application of knowledge, skills, tools and techniques to project activities in order to meet or exceed stakeholder needs and expectations.

1.13: CHAPTER END ACTIVITIES AND QUESTIONS

- a) Project experts believe that project is a cutting edge for development. Do you agree? Why?
- b) Some writers argue that project is the development tool for undeveloped countries. Do you agree? Why?
- c) From your environment, short list six projects, if any, and classifies them as normal, crush, and disaster projects with brief explanation.
- d) Briefly discuss the relevance of a project for a country like Ethiopia.
- e) Explain in brief application of the concept of “management-by-project” in your office, if employed, or in your house hold management.
- f) Discuss the difference among national economic policy, plan, strategy, program, project, work package, task and activity, with illustration.

CHAPTER TWO: PROJECT LIFE CYCLE

INTRODUCTION

Projects usually go through a series of identifiable stages. Authors have described these as the **project cycle**. Project cycle is the various stages through which project planning process proceeds from inception to implementation and then to evaluation. It considers a various separable stages of activity which can be thought of as constituting a definite sequence in which each stage not only grown out of the preceding ones, but leads into the subsequent ones.

LEARNING OBJECTIVES

After studying this chapter, you should be able to:

- Describe the stages of project planning process: project cycle
- Understand the management approach to project cycle
- Understand the project clearance reports
- Understand the management approach to project cycle

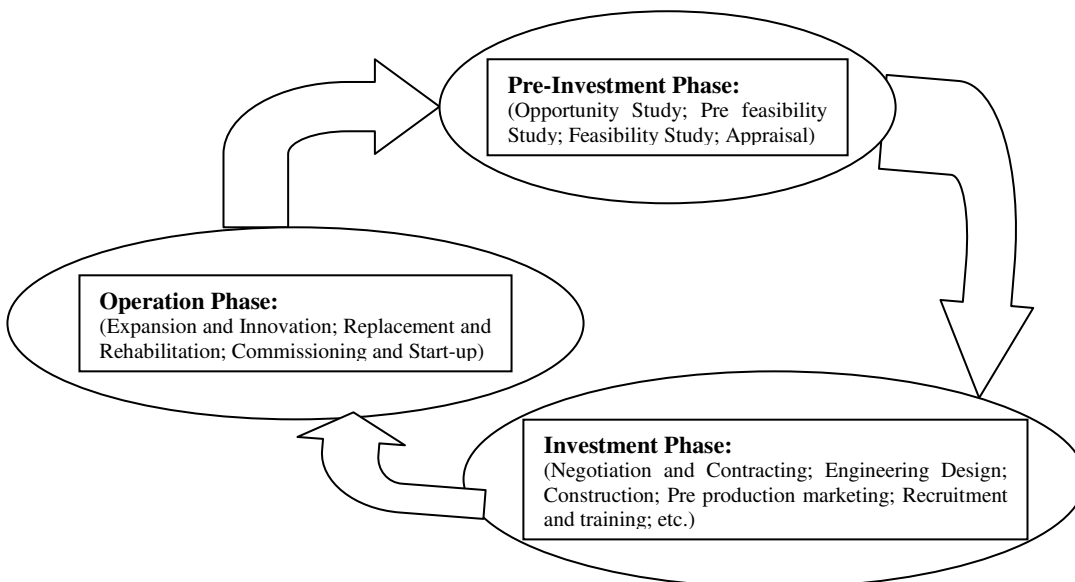
2.1: PROJECT LIFE CYCLE

There are various models that deal with the project cycle, which usually relate to the organizational perspective of the authors, such as Baum's, United Nations Industrial Development Organization (UNIDO), Choudhury's, etc. This section presents and provides detail explanations on the UNIDO's, Baum's, Choudhury's, United Nations Environment Program (UNEP's), Project Management Body of Knowledge (PMBOK's), and Baars's models.

2.1.1: UNIDO'S PROJECT LIFE CYCLE (UNIDO MODEL)

The United Nation's Industrial Development Organization (UNIDO) gives emphasis to industrial projects. It is more practical than conceptual. Beherens and Hawranck (1991) in collaboration with the UNIDO have identified three project phases: Pre-Investment, Investment and Operation Phases.

Figure 2.1: UNIDO (1991) Project Life Cycle



a) PRE-INVESTMENT PHASE

The preinvestment phase includes project activities such as:

- Identification of investment opportunities that normally called opportunity study,
- Pre-feasibility study (preliminary project selection and definition),
- Feasibility study (Project formulation), and
- Appraisal and Decision (Evaluation and investment decision), etc.

b) INVESTMENT PHASE

The investment phase includes project activities such as:

Project and Engineering Design

It comprises of designs of buildings and other facilities that include time scheduling, site prospecting and probing, preparation of blue prints, detailed plant engineering and a final selection of technology and equipment.

Negotiation and Contracting

It includes definition of the legal obligations in respect to project financing, acquisition of technology, construction of building and services, and supply of machinery and equipment for the operation phase. It also requires negotiation with equipment and machinery suppliers and collaborators and contracting with architects and contractors.

Construction

It includes actual construction of building, installation of machinery and manpower. It involves site preparation, construction of building and other civil works together with the erection and installation of equipment in accordance with proper programming and scheduling.

Recruitment and Training of Workers

It includes local and abroad recruitment and training of workers for the smooth running of operation. It should proceed simultaneously with the construction stage and it may prove relevant to the rapid growth of productivity and efficiency.

Commissioning and Start up

It requires handover of the building to project sponsor or promoter. Start up (delivery stage) is brief but technically critical span in project development. Its success indicates the effectiveness of the planning and execution of the project.

c) OPERATION PHASE

The operation phase includes project activities such as expansion and innovation, replacement and rehabilitation, and commissioning and start-up. The issues in the operational phase need to be considered both from long and short-term viewpoints.

i. The short-term view point relates to:

- Application of production
- Operation of Equipment
- Labour productivity and skill, etc.

ii. The long-term view point relates to:

- Production cost
- Income from sales, etc.

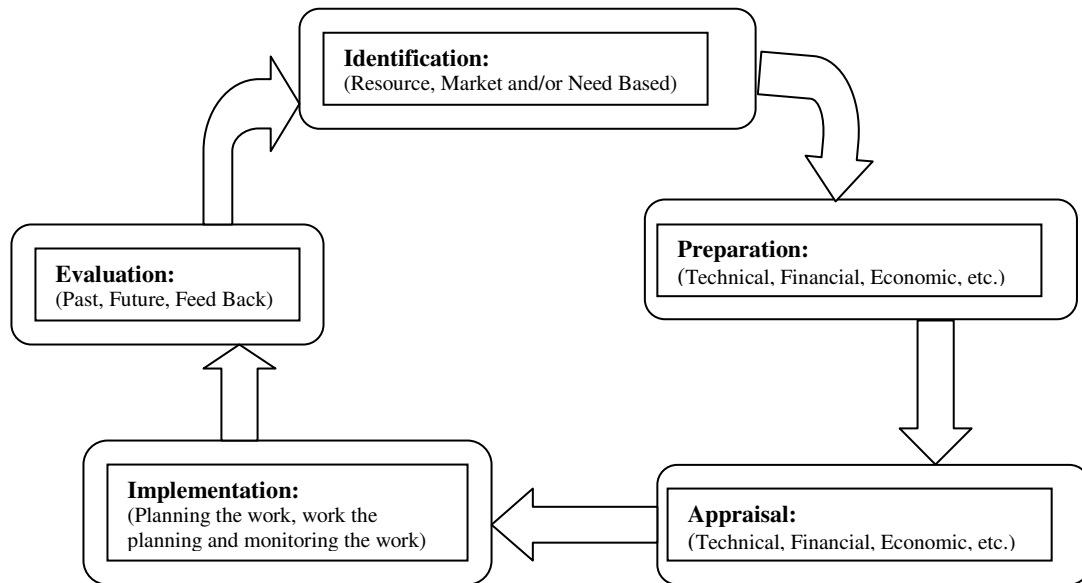
Activity 2.1: Assuming that you are studying a “Bread Bakery” project, list the series of activities that will be involved in your investment phase.

2.1.2: BAUM'S PROJECT LIFE CYCLE (BAUM'S MODEL)

Baum (1978), an employee for the World Bank, has developed the following five project cycles that are related with performance of the World Bank:

- a) **Identification** - Selection of viable ideas
- b) **Preparation** - Determine whether the project is viable or not.
- c) **Appraisal** - Audit whether the preparation process is carried out adequately.
- d) **Implementation:** - Actual implementing of the project (construction of building, hiring employees, etc.)
- e) **Evaluation** - Evaluate whether the project has enabled to achieve the desired objective since its implementation.

Figure 2.2: Baum (1978) Project Life Cycle



a) PROJECT IDENTIFICATION

Project identification consists in finding project ideas that could contribute towards achieving specified development objectives. But, where do projects come from? There is no simple answer. Some may be "**resource based**" - stem from the opportunity to make profitable use of available resources; "**market based**" - arise from an identified demand in home or overseas markets; and "**need based**" - to make available to all people in an area where minimal amounts of certain basic material requirements and services exist.

Once some project ideas have been put forward, the first step is to select one or more of them as potentially promising. This calls for a quick preliminary screening by experienced professionals who could also modify some of the project proposals.

Preliminary screening is conducted to reduce to a manageable number the project alternatives to which more work and time will be devoted. As a result of preliminary screening exercise, some of the project alternatives will be rejected and those that are promising will be advanced to the next stage.

Exhibit 2.1: Project Identification

The **Identification** phase is one of identifying the problems, which need to be addressed, and analyzing the ways in which they can be addressed. This would include, for example:

- Analysis of existing situation
- Problems/needs identification
- Prioritization of ideas
- Selection of a project idea
- Definition of the project idea
- Consultation with stake holders
- Establishment of overall objectives

Activity 2.2: By scanning your environment, generate one development project idea each based on resource, market and need.

b) PROJECT PREPARATION (FEASIBILITY STUDY)

Project preparation sometimes called project formulation covers the establishment of technical, financial, economic, social and institutional aspects of the project. Following preliminary screening, promising project options should be investigated in a systematic manner. The analysis of the projects technical, commercial, social, environmental, financial, economic and institutional aspects should be detailed and comprehensive enough to decide on the future of the project with confidence.

Exhibit 2.2: Project Formulation/Preparation

The **Preparation/Formulation** stage involves the detailed planning of the project idea. The result of which is a set of tangible proposals with an associated set of costs and benefits. These will usually be contained in **pre-feasibility** or **feasibility** study. Further more, this phase is one of defining more clearly the actual project, who will do it, what resources are viable, and how it will be divided into different tasks. This would include:

- Specification of objectives and results
- Identifying resources available for the project
- Identifying resources needed for the project
- Design of the project
- Packaging and planning of the project

Activity 2.3: Explain in brief the necessity of project feasibility in development project study by giving example.

c) APPRAISAL

It is the comprehensive and systematic assessment of all aspects of a proposed project. During appraisal, it should be verified that the proposed project, in combination with other policies, contributes the maximum possible towards achieving certain development objectives. In project appraisal, a project is viewed from different perspectives: technical (including ecological), commercial, sociological, financial, economic, managerial and organizational.

When appraisal is completed, an appraisal report is prepared which contains the findings and final recommendations. The recommendation may be to approve, reformulate, postpone or abandon the project under review.

Exhibit 2.3: Project Appraisal

The **Appraisal/Audit** phase involves a systematic review of all aspects of the project in order that a decision can be made as to whether to proceed. The following questions are often the subject of an appraisal report on the basis of which a series of decisions may be made. These could involve discarding the project or alteration of some of the plans.

- **Technical-** Is the project design appropriate and will the project work as expected?
- **Financial-** Has proper provision been made to cover the financial requirements and obligations of the project? Is the financing planned adequate? Are the financial aspects of the project beneficial to the different actors and beneficiaries involved with the project? If the project is commercial how will the necessary inputs be obtained and (where relevant) how will the output be sold?
- **Economic-** Is the project advantageous from the point of view of the economy as a whole?
- **Social-** Is the project both advantageous and acceptable to the people affected by it?
- **Institutional-** Are there suitable organizations in place to implement and manage the project? Is the legal framework appropriate?
- **Environmental-** Have the environmental impacts of the project been properly considered?
- **Sustainable-** Will the project be sustainable in the long term both financially and institutionally?

Activity 2.4: Discuss in brief on the relevance of project appraisal by giving an illustration.

Once financing is secured and a final go-ahead (green light) given to proceed with the implementation of a given project, inter-organizational linkages for its smooth implementation are streamlined, and a project office is set up. All the construction and supervision of the project is made.

Immediately after the completion of project implementation, management and assets are integrated into the operation to the new economic entity or unit. Project operation involves the running and maintenance of the new entity in accordance with planned objectives and tasks.

The major priority during this stage is to ensure that the project is carried out in the way and within the period that was planned. The feedback effect on the discovery and design of new projects and deficiencies in the capabilities of the project actors can be revealed in this stage. Thus, recording, monitoring, and progress reporting are important activities so as to allow management to become aware of difficulties as they arise.

Exhibit 2.4: Project Implementation

The **Implementation** phase is one of actually performing the project and ensuring that the objectives are met and the outputs made. This includes:

- Mobilization of resources for each task and objectives
- Project marketing
- Ongoing monitoring and reporting arrangement
- Identifying problems
- Addressing failures
- Modification of the planned results and project objectives as appropriate

e) PROJECT EVALUATION

Once a project has been carried out, it is often useful to look back over what took place, to compare actual progress with the plans, and to judge whether the decisions and actions taken were responsible and useful.

Evaluation can help not only in the management of the project but also help in the planning of future projects. As a result of undertaking evaluation, major achievements and problems are identified, recommendations for remedial action made and lessons of experience drawn (experience with one project can give rise to new ideas for extension of the existing project as well as formulation of new project).

Exhibit 2.5: Project Evaluation

The **Evaluation** phase is the process of reviewing the completed project to see whether the intended benefits are likely to be achieved. It should be a natural part of the process and not seen as a 'punishment' for a project, which has failed to perform. This includes:

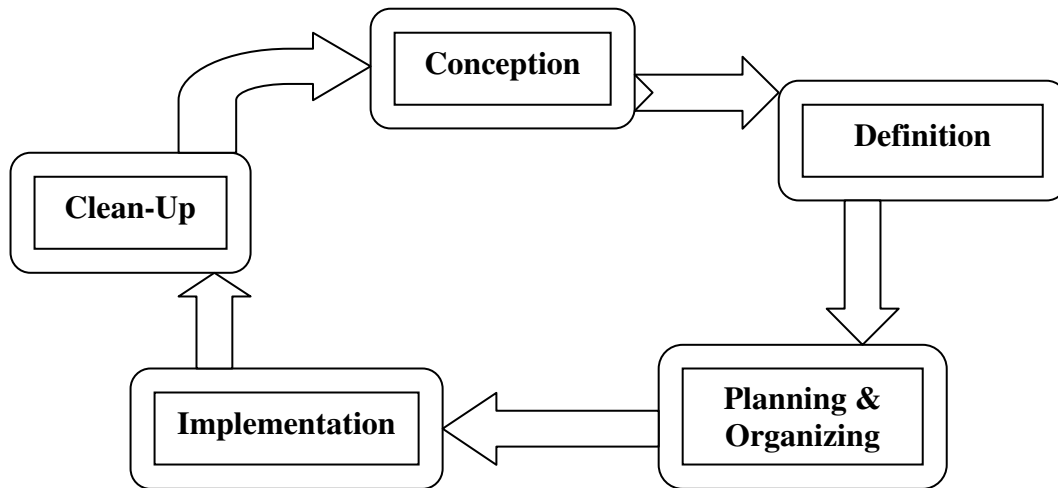
- Assessing whether the contractor has truly completed the task
- Identifying best practice for further projects
- Identifying what resources are required for the future (if something goes wrong this may mean that more resources are required rather than that the project has failed)?
- Identifying the need for future projects

Activity 2.5: Discuss in brief on the relevance of project evaluation by giving example. In addition, explain the basis for project evaluation.

2.1.3: CHOUDHURY'S PROJECT LIFE CYCLE

According to an Indian scholar, **Choudhury (1988)**, the project life cycle has five phases: Conception, Definition, Planning and Organizing, Implementation and Clean-Up.

Figure 2.3: Choudhury (1988) Project Life Cycle



a) CONCEPTION

It is the phase where the project ideas germinate or conceived. This could be because of two reasons:

- i) **Growth-** expansion, modernization, diversification, etc.
- ii) **Solve a problem-** to remove constraints.

Project idea can be conceived by any body in the organization and therefore has to be put in black and white before it can be compared with other project ideas or weigh to be seen its relevance. Project ideas examined in the light of projective constraints, opportunities, and what finding shows a green light may become the future project. All projects are identified or conceived in this way.

b) DEFINITION

It defines the conception phase and therefore works to define the idea generated during the conception phase. This phase prepares a document using sufficient details and on the basis of this documents all customers, or financial institutions, or government may say yes or no to the project idea. This project report is called a **Detailed Project Report (DPR)**. For instance, for a cement industry, the DPR encompasses raw material availability, plant size and capacity, technology selection, plant lay out, machinery and equipments needed, electrification and infrastructure work, civil and engineering work, utility (telephone, water, fuel, power, etc), financial analysis (total investment cost, source of finance, total production cost), the implementation schedule (when to start and end), etc.

What are the best decisions with the product leads to that signal it gets from the government. Banks have laid down various projects appraisal procedures.

c) PLANNING AND ORGANIZING

It involves in the planning of the projects and organizing the human and non-human resources required to implement the project. It looks in to organizing or arranging for items needed, like purchase of technology, machines and equipments, inviting tenders, say, from construction company for construction of plan, call for issue of shares, call for appointment of specialized personnel, etc.

d) IMPLEMENTATION

It is the phase where the conceived project idea takes shape gradually, in this fieldwork starts. For capital equipment projects, it includes actual ordering and receipts, equipment and machine erections, civil construction of the plant, electrical piping, fitting, etc, trial and run, and final commissioning.

Since this phase takes maximum time, everybody wants to start (implement) the work at the early possible time and try to complete at the minimum cost. Efforts are made to "**fast track**" the project by overlapping (merging) some stages, i.e., engineering (design), ordering, receipt, construction, and commissioning. The amount (degree) of fast tracking depends. If, for example, designing and construction are undertaken by different contracts, then the scope of fast tracking will be limited. However, if design, supply, and construction, all as a package, are with one subcontractor, maximum amount of fast track is possible.

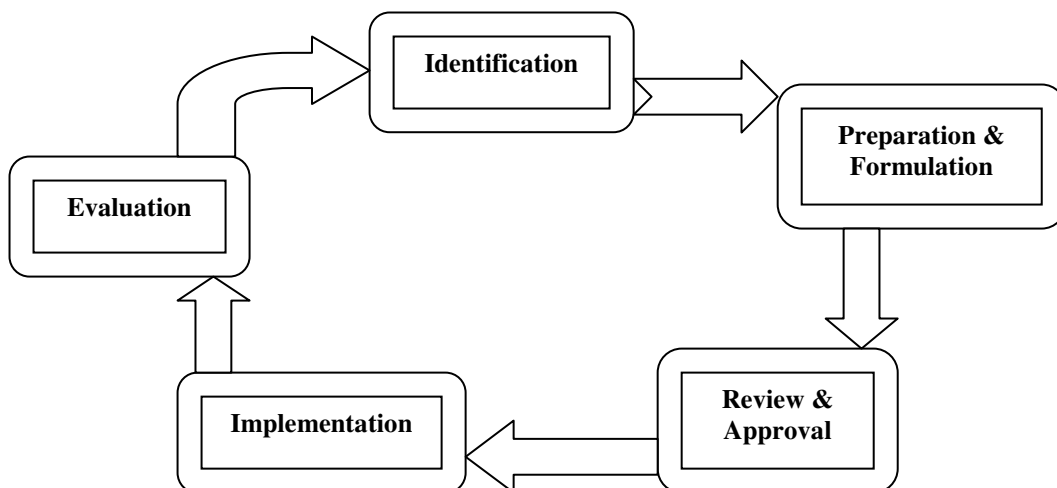
e) CLEAN-UP

It is where the plant commission is handed over to different agency for production. This is where the **BOT (Built, Operate, Transfer)** or **BOLT (Built, Operate, Lease, Transfer)** works and hence known as **Transaction Phase**. This includes closing of all accounts, etc. As the project is in termination phase, project team also disintegrates and each person leaves the organization in the very sequence in which they hand entered. For example, designing and architecture could leave before construction engineers. Every organization also prepares lessons learned from this project for future project works including qualitative and quantitative database. This is known as "**feedback phase**". The information includes assessment of customers' e-mail, listing of problems encountered and remedies taken, technological advancements, and therefore recommendation for future **R & D (Research and Development)** and future projects.

2.1.4. UNEP'S PROJECT LIFE CYCLE

The UNEP's project cycle can be explained in terms of five phases: **identification**, **preparation** and **formulation**, **review** and **approval**, **implementation**, and **evaluation**. Distinctions among these phases, especially between identification and preparation, are often unclear in practice and their relative importance varies greatly, depending on the character, scale and history of the project. These five phases of the project cycle should be viewed as iterative steps, not as a linear set of sequential steps.

Figure 2.4: UNEP (2005) Project Life Cycle



1. PROJECT IDENTIFICATION

Project identification starts from an understanding of the UNEP mandate and objectives. It involves identifying environmental problems to be addressed and the needs and interests of possible beneficiaries and stakeholders. The problems and the most realistic and effective interventions are analyzed, and ideas for projects and other actions are identified and screened.

a. Situation Analysis

An environmental situation needs to be assessed and analyzed. This objective analysis enhances understanding of the likely causes and linkages between existing problems and the needed actions. A situational analysis based on a scientifically sound conceptual framework generates key actions and strategies to be applied for the intended project intervention. Latest country reports and statistics prepared by Governments, researchers, or international organizations on the relevant environmental, social and economic issues, including gender and poverty, can facilitate the assessment. A situation analysis should include analyses of needs, interests, strengths and weaknesses of key stakeholders and beneficiaries.

b. The Identification Test

A proposal may be deemed to have passed the identification test and be ready for detailed preparation when:

- Major options and alternatives have been identified and some initial choices made;
- The principal institutional and policy issues affecting project outcome have been identified and deemed amenable to solution;
- The project options selected are expected to be justified, given rough estimates of the expected costs and benefits;
- There is justifiable expectation that the project will have adequate support from the relevant political authorities, other stakeholders and the intended beneficiaries;
- There is compatibility with UNEP mandate and objectives.

c. Preparation of Concept Proposal for Sponsorship

Project formulation begins with the drafting of a proposal for sponsorship (a short concept proposal of 4–5 pages) that lays out preliminary ideas, objectives, results, strategies, outputs and activities. This proposal is used as the basis for consultations with implementing partners and Governments.

2. PROJECT PREPARATION AND FORMULATION

a. Feasibility Study

A feasibility study should form the core of the proposal preparation process. Its purpose is to provide stakeholders with the basis for deciding whether or not to proceed with the project and for choosing the most desirable options. The feasibility study must provide answers to the following basic questions:

- Does the project conform to the development and environmental objectives and priorities of the specific country and or region?
- Is the project technically and scientifically sound, and is the methodology the best among the available alternatives?
- Is the project administratively manageable?
- Is there adequate demand for the project's outputs?
- Is the project financially justifiable and feasible?
- Is the project compatible with the customs and traditions of the beneficiaries?
- Is the project likely to be sustained beyond the intervention period?

b. Project Document Formulation

Project preparation and formulation and project document formulation are simultaneous processes. Once the feasibility study has taken place and implementation arrangements are agreed upon, the concept proposal (which would have been revised throughout the process) is transformed and expanded into a project document throughout the project preparation and formulation phase. The project document is a summary of the situation assessment, justification of methodology and strategies for achieving the targeted changes, which come from each step taken through project cycle phases 1 and 2. Since project formulation is an iterative process, it is important to consult again with selected partners and colleagues as the document is formulated.

c. Establishment of Baseline and Target Data

Data or information in the subject area of the intended project should be gathered during the project identification process (phase 1) and analyzed to assess the condition or situation of the targeted populations or areas. It is possible that the existing data or information are insufficient or not valid, or that the necessary data or information do not exist at all. In these cases, the project identification process will need to include rapid assessments. Collection and analysis of such data form the baseline data for developing indicators for measuring outputs and results.

The feasibility study guides project managers in proposing reasonable and achievable targets or outcomes.

d. Project Implementation Planning

Success of project implementation often depends on the quality of project planning before the project begins. The following UNEP project submission checklist is designed to assess the feasibility of projects and the readiness of project managers to undertake them. The checklist is designed as the project managers' reference guide in planning for effective and efficient project implementation.

- Have all relevant UNEP Divisions and regional offices been consulted and are they fully familiar with the project document?
- Have the possible duplications or complementarities with existing or former Global Environment Facility or UNEP projects been examined?
- Have the roles and responsibilities of the implementing partners, including UNEP Divisions, cooperating agencies or supporting organizations, been clearly established and agreed upon?
- Do the implementing partners have administrative, technical and human capacities to undertake the project?
- Do the UNEP Divisions involved have the technical and human capacities to undertake the project?
- Have the priorities and needs of the countries selected for the project been identified and incorporated in the project?
- Do the relevant Governments support or endorse the project?
- Has a gender-sensitivity analysis been conducted and incorporated in the project document?
- Has the linkage to poverty alleviation been analyzed and incorporated in the project document?
- Have all key stakeholders been identified and included in the partnership for project management?
- Does the project incorporate activities to ensure policy, technical and financial sustainability beyond the project implementation period?

3. PROJECT REVIEW AND APPROVAL

UNEP has a project review and approval mechanism comprising an inter-divisional review (IDR) and a project approval group.

The inter-divisional review aims:

- To improve quality of UNEP proposals;
- To promote knowledge-sharing among colleagues in a similar field of expertise by sharing best practices, substantive and technical knowledge, and methodological or implementational suggestions, including information about cooperating agencies or supporting organizations; and
- To enhance inter-divisional dialogue and collaboration in project implementation.

Inter-divisional reviews can take place either with the concept proposals for sponsorship, at the stage before UNEP seeks funding for the project, or after the development of the full project document after funding is secured.

The appraisal and approval process of the project approval group for projects and costed work plans varies depending on the level and sources of funding.

The project approval group applies the following approval criteria:

- The extent to which the activities, results and objectives conform and contribute to the UNEP mandate and strategic and program objectives;
- The extent to which the results identified are realistic, achievable and sustainable;
- The extent to which gender and poverty perspectives are reflected in project strategies and activities;
- The linkage between the justification or background and the intervention being proposed;
- The capacity of UNEP and implementing partners to undertake the project;
- The extent to which the project incorporates and builds on the previous experience and lessons learnt of UNEP;
- The level of risk in full project implementation; and
- The extent to which the proposed intervention is sustainable and replicable.

4. PROJECT IMPLEMENTATION

Projects that go through the appropriate steps in phases 1 and 2 will take less time between approval and implementation, and significantly reduce the risks involved in implementing a project. Budgeted resources are more likely to be used to implement activities and achieve the intended results and objectives. Project managers monitor expenditure, activities, output completion and workflows against their implementation plans, output delivery and the progress made towards achieving the results and objectives according to their anticipated milestones or benchmarks. Project sustainability beyond the project duration and replicability of the project strategy and methodology should be borne in mind throughout the implementation period.

a. Monitoring

Monitoring is a continuous process that aims primarily to provide project management and give the main stakeholders early indications of progress or lack of progress towards achieving project objectives. A progress analysis during project implementation through monitoring serves to validate the initial assessment of relevance, effectiveness and efficiency or to fill in the gaps. It may also detect early signs of the project's success or failure. Monitoring assists project managers and implementing agencies to address any impediments to progress and make adjustments so that results can be achieved within the designated timeframe.

Monitoring is an internal process that also looks at project processes (both programmatic and financial) and makes changes in assumptions and risks associated with target groups, institutions or the surrounding environment.

b. Risk Assessment and Management

Projects often encounter risks during implementation. Managing risks by recognizing and preparing for a range of possible future outcomes is an integral part of project management. Risks arise out of uncertainty, both from internal and external sources. They could include:

- Adverse changes in economic factors;
- Incorrect assumptions regarding project logic or sustainability considerations;
- Dissatisfaction on the part of target beneficiaries;
- A breach of legal or contractual responsibility by the implementing agencies;
- Changes in the political and bureaucratic structure of the partner Governments;
- Failure of the partner Governments to meet their obligations to the project;
- Fiscal fraud and deficiencies in financial controls and reporting;
- A threat to physical safety of the personnel or breach of security; and
- Mismanagement.

During project implementation, the implementing agencies and project managers should update and refine their risk assessment and formulate a risk management plan. When contingencies arise, risk management strategies should be implemented.

5. PROJECT EVALUATION

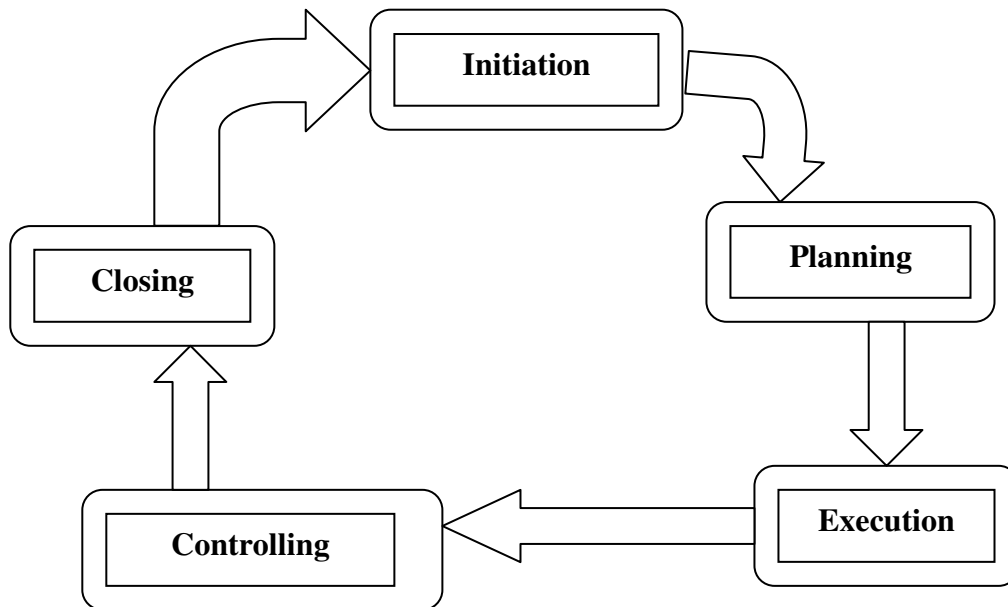
Evaluation is a time-bound exercise that attempts to assess the relevance, performance and success of current or completed projects, systematically and objectively. Evaluation determines to what extent the intervention has been successful in terms of its impact, effectiveness, sustainability of results, and contribution to capacity development. Evaluation, more than monitoring, asks fundamental questions on the how and why of the overall progress and results of an intervention in order to improve performance and generate lessons learned.

When carried out after project completion, evaluation can contribute to extracting lessons to be applied in other projects. Evaluations at the midpoint of the project or program also provide timely learning that can suggest mid-course adjustments.

2.1.5: PMBOK'S PROJECT LIFE CYCLE

According to Egan (2009), the project process groups (or life cycle stages) are defined by the activities they include. It is helpful to have a big picture view of where each of the process groups begins and ends. The project process life cycle stages are categorized in to five phases: Initiation, Planning, Execution, Controlling and Closing.

Figure 2.5: PMBOK (1996) Project Life Cycle



1. INITIATION

Initiation begins with a project idea. The idea may be internally generated or may be the consequence of a contract with outside customers. There may be a statement of work outlining what is required. There may only be a vague idea based on the musings of senior management.

Overlaid over the need for a project are the rules, regulations, and practices that determine how an individual company manages and selects projects. Initiation is complete when a **project charter** and **preliminary scope statement** have been prepared and a project manager has been assigned to the project.

A project charter is an outline (with varying degrees of detail) of what the sponsors of the project expect the project to accomplish. It should define constraints and identify the major stakeholders involved.

A preliminary scope statement is a detailed look at what exactly the project is expected to deliver. At this point there is little or no discussion of how- just what and why. The scope statement may include a review of constraints and their priority, such as a completion date and proposed budget. The preliminary scope statement is often prepared under the direction of the project manager. However, it may be prepared by the sponsors before the Project Manager has been named. It is possible for a contract or statement of work to include all the necessary details that a preliminary scope statement requires.

Initiation ends when there is a project manager and that project manager has been given the authority and direction necessary to begin planning.

2. PLANNING

Planning begins with the outputs of initiation (charter, preliminary scope statement, and project manager). Planning starts with a detailed idea and ends when the entire project has been completed on paper. That is, the entire project is dismantled into numerous discrete activities, and those activities have been budgeted and scheduled. At the end of planning, the entire project has been thought through: what will be done; how; in what order; and at what cost.

The planning process is directed by the project manager and completed by the project team and stakeholders. Planning is complete when there is a project plan. The act of creating a project plan involves many separate management process incorporating various knowledge areas. For each knowledge area there is a management plan prepared as well as documents that detail what will be accomplished and how.

Formal project management plans are thick. They describe how and when activities will be undertaken as well as the procedures that will be followed to ensure the correct work is done in the correct order.

The project plan states how the project will be run. Plan the work and then work the plan.

3. EXECUTION

Execution cannot begin until there is a plan. Executing is the act of doing what it says to do in the plan. It is completed when all the work is completed.

4. CONTROLLING

Controlling is the act of making sure that the work being executed complies with the plan. The objective is acceptance of deliverables by the customer.

Controlling cannot start until there are work results generated by execution. Controlling involves monitoring completed work results to ensure that they match the plan and meet stakeholder expectations. If they do not, information is feed back to the execution processes so that corrective actions are taken.

Controlling is complete when the final outputs of the project (deliverables) meet the prescribed quality standards defined in the plan and are accepted by the customer. It ends at the same time as execution.

5. CLOSING

Closing ensures that an organization learns from its experience. An organization cannot get better at project management if it does not learn. Organizations learn by documenting what was learned- what went right and what went wrong- and making these documents available for reference on future projects.

Closing begins when deliverables are accepted. It involves making sure that all the necessary paperwork is completed in terms of contract administration and sign off. It continues until a project archive has been compiled. This archive includes not only a complete set of project records but also a critical review of lessons learned.

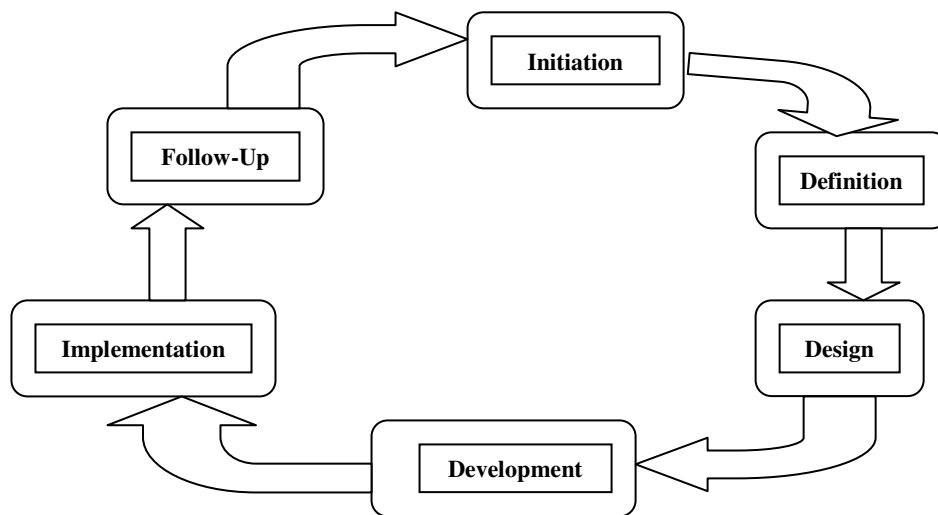
2.1.6: BAARS'S PROJECT MANAGEMENT LIFE CYCLE

Baars (2008), who is one of the European Project Management Professionals, identified a six phase project management (i.e., Project Life Cycle) particularly appropriate for Information Technology (IT) related projects.

Dividing the project into phases makes it possible to lead it in the best possible direction. The total work load of a project is divided into smaller components, thus making it easier to monitor. The following paragraphs describe a phasing model that has been useful in practice. It includes six phases:

- Initiation phase (Idea)
- Definition phase (What?)
- Design phase (How?)
- Development phase (How to implement?)
- Implementation phase (Implementation)
- Follow-up phase (Maintenance)

Figure 2.6: Baars (2008) Project Management Life Cycle



1. INITIATION

The initiation phase is the beginning of the project. In this phase, the idea for the project is explored and elaborated. The goal of this phase is to examine the feasibility of the project. In addition, decisions are made concerning who is to carry out the project, which party (or parties) will be involved and whether the project has an adequate base of support among those who are involved.

In this phase, the current or prospective project leader writes a proposal, which contains a description of the above-mentioned matters. The project proposal includes business plans and grant applications. The prospective sponsors of the project evaluate the proposal and, upon approval, provide the necessary financing. The project officially begins at the time of approval. Questions to be answered in the initiation phase include the following:

- Why this project?
- Is it feasible?
- Who are possible partners in this project?
- What should the results be?
- What are the boundaries of this project (what is outside the scope of the project)?

In the initiation phase, the project partners enter a (temporary) relationship with each other. To prevent the development of false expectations concerning the results of the project, it makes sense to explicitly agree on the type of project that is being started:

- A research and development project,
- A project that will deliver a prototype or ‘proof of concept’, and/or
- A project that will deliver a working product.

The choice for a particular type of project largely determines its results. For example, a research and development project delivers a report that examines the technological feasibility of an application. A project in which a prototype is developed delivers all of the functionalities of an application, but they need not be suitable for use in a particular context (e.g. by hundreds of users). A project that delivers a working product must also consider matters of maintenance, instructions and the operational management of the application.

Many misunderstandings and conflicts arise because the parties that are involved in a project are not clear on these matters. Customers may expect a working product, while the members of the project team think they are developing a prototype. A sponsor may think that the project will produce a working piece of software, while the members of the project team must first examine whether the idea itself is technically feasible.

2. DEFINITION

After the project plan (which was developed in the initiation phase) has been approved, the project enters the second phase: the definition phase. In this phase, the requirements that are associated with a project result are specified as clearly as possible. This involves identifying the expectations that all of the involved parties have with regard to the project result. How many files are to be archived? Should the metadata conform to the Data Documentation Initiative format, or will the Dublin Core (DC) format suffice? May files be deposited in their original format, or will only those that conform to the ‘Preferred Standards’ be accepted? Must the depositor of a dataset ensure that it has been processed adequately in the archive, or is this the responsibility of the archivist? Which guarantees will be made on the results of the project? The list of questions goes on and on.

It is important to identify the requirements as early in the process as possible. Wijnen (2004) distinguishes several categories of project requirements that can serve as a memory aid (as cited in Baars, 2008):

a. Preconditions

Preconditions form the context within which the project must be conducted. Examples include legislation, working-condition regulations and approval requirements. These requirements cannot be influenced from within the project.

b. Functional Requirements

Functional requirements are requirements that have to do with the quality of the project result (e.g. how energy-efficient must an automobile be or how many rooms must a new building have?).

c. Operational Requirements

Operational requirements involve the use of the project result. For example, after a software project has been realized, the number of malfunctions that occur must be reduced by ninety per cent.

d. Design Limitations

Design limitations are requirements that involve the actual realization of the project. For example, the project cannot involve the use of toxic materials or international partners for whom it is unclear whether they use child labour.

It is very important that all parties that are involved in the project are able to collaborate during the definition phase, particularly the end users who will be using the project result. The fact that end users are often not the ones that order the project perhaps explains why they are often ignored. The client, who pays for the project, is indeed invited to collaborate on the requirements during the definition phase. Nonetheless, the project result benefits when its future users are also invited. As a point of departure, it is helpful to make a habit of organizing meetings with all concerned parties during the definition phase of a project.

The result of the definition phase is a list of requirements from the various parties who are involved in the project. Every requirement obviously has a reverse side.

The more elaborate the project becomes, the more time and money it will cost. In addition, some requirements may conflict with others. New copy machines are supposed to have less environmental impact; they must also meet requirements for fire safety. The fire-safety regulations require the use of flame-retardant materials, which are less environmentally friendly. As this illustration shows, some requirements must be negotiated.

Ultimately, a list of definitive requirements is developed and presented for the approval of the project's decision-makers. Once the list has been approved, the design phase can begin. At the close of the definition phase, most of the agreements between the customer and the project team have been established.

The list of requirements specifies the guidelines that the project must adhere to. The project team is evaluated according to this list. After the definition phase, therefore, the customer can add no new requirements.

3. DESIGN

The list of requirements that is developed in the definition phase can be used to make design choices. In the design phase, one or more designs are developed, with which the project result can apparently be achieved. Depending on the subject of the project, the products of the design phase can include dioramas, sketches, flow charts, site trees, HTML screen designs, prototypes, photo impressions and UML schemas. The project supervisors use these designs to choose the definitive design that will be produced in the project. This is followed by the development phase. As in the definition phase, once the design has been chosen, it cannot be changed in a later stage of the project.

4. DEVELOPMENT

During the development phase, everything that will be needed to implement the project is arranged. Potential suppliers or subcontractors are brought in, a schedule is made, materials and tools are ordered, instructions are given to the personnel, etc. The development phase is complete when implementation is ready to start. All matters must be clear for the parties that will carry out the implementation.

In some projects, particularly smaller ones, a formal development phase is probably not necessary. The important point is that it must be clear what must be done in the implementation phase, by whom and when.

5. IMPLEMENTATION

The project takes shape during the implementation phase. This phase involves the construction of the actual project result. Programmers are occupied with encoding, designers are involved in developing graphic material, contractors are building, and the actual reorganization takes place. It is during this phase that the project becomes visible to outsiders, to whom it may appear that the project has just begun. The implementation phase is the 'doing' phase, and it is important to maintain the momentum. This phase is complete when all of the requirements have been met and when the result corresponds to the design.

Those who are involved in a project should keep in mind that it is hardly ever possible to achieve a project result that precisely meets all of the requirements that were originally specified in the definition phase. Unexpected events or advancing insight sometimes require a project team to deviate from the original list of requirements or other design documents during the implementation of the project.

This is a potential source of conflict, particularly if an external customer has ordered the project result. In such cases, the customer can appeal to the agreements that were made during the definition phase. As a rule, the requirements cannot be changed after the end of the definition phase. This also applies to designs: the design may not be changed after the design phase has been completed. Should this nonetheless be necessary (which does sometimes occur), the project leader should ensure that the changes are discussed with those involved (particularly the decision-makers or customers) as soon as possible. It is also important that the changes that have been chosen are well documented, in order to prevent later misunderstandings.

6. FOLLOW-UP

Although it is extremely important, the follow-up phase is often neglected. During this phase, everything that is necessary to bring the project to a successful completion is arranged. Examples of activities in the follow-up phase include writing handbooks, providing instruction and training for users, setting up a help desk, maintaining the result, evaluating the project itself, writing the project report, holding a party to celebrate the result that has been achieved, transferring to the directors and dismantling the project team.

The central question in the follow-up phase concerns when and where the project ends. Project leaders often joke among themselves that the first ninety percent of a project proceeds quickly and that the final ten per cent can take years. The boundaries of the project should be considered in the beginning of a project, so that the project can be closed in the follow-up phase, once it has reached these boundaries.

It is sometimes unclear for those concerned whether the project result is to be a prototype or a working product. This is particularly common in innovative projects in which the outcome is not certain. Customers may expect to receive a product, while the project team assumes that it is building a prototype. Such situations are particularly likely to manifest themselves in the follow-up phase.

For instance, consider the case of a software project to test a very new concept. There was some anxiety concerning whether any results would be produced at all. The project eventually produced good results. The team delivered a piece of software that worked well, at least within the testing context. The customer, who did not know much about IT, thought that he had received a working product. After all, it had worked on his office computer. The software did indeed work, but when it was installed on the computers of fifty employees, the prototype began to have problems, and it was sometimes unstable.

The motto, 'Think before you act' is at the heart of the six-phase model. Each phase has its own work package. Each work package has its own aspects that should be the focus of concentration. It is therefore unnecessary to continue discussing what is to be made during the implementation phase. If all has gone well, it was already determined in the definition phase and the design phase.

2.2: IMPROVING PROJECT LIFE CYCLE MANAGEMENT PROCESS

Section 2.1 above identifies several project cycle approaches that can be taken to managing project activities from beginning to end. Many organizations utilize variations on these project stages. However, there is no essential content difference among the alternative project management life cycles. Their basic difference attributes to the nature of particular project, such as Civil Engineering and IT-related projects. Regardless of the approach employed, careful consideration needs to be given to clarify surrounding project goals, objectives and, importantly, the roles and responsibilities of all participants and stakeholders.

Once the life cycles have been designed and documented for each category or subcategory of projects, it is then possible to define and document the project life cycle management system for each. Only when such documentation exists can the system be improved in a systematic, integrated manner. To establish a total quality management (TQM) approach to an organization's project management capabilities and to avoid sub-optimal improvements being introduced on a disjointed, piece-meal basis, the following approach is recommended by Archibald (2008):

1. Document the integrated life cycle process model.
2. Document and describe the resulting Project Life Cycle Management System (PLCMS) for each project category within the organization.
3. Re-engineer the integrated process to apply appropriate re-engineering methods to each category's PLCMS to:
 - Identify system constraints, gaps and weaknesses.
 - Identify 'speed bumps' that inadvertently slow the process down and potential 'accelerators' that can speed it up.
 - Relate the undesirable project results and possible causes to the PLCMS wherever possible.
 - Redesign the PLCMS beginning with the most obvious constraints, gaps and weaknesses and document the results.
4. Implement the Improvements.
 - Obtain needed agreements and conduct appropriate tests or analyses to prove out the validity and feasibility of the proposed system revisions.
 - Plan, approve and execute the improvement project to implement the revised PLCMS.
5. Repeat the steps as required until an optimum achievable PLCMS has been implemented.

The PLCMS improvement team must include experienced practitioners from within the organization who are familiar with the existing PM practices.

2.3: INTEGRATED PROJECT PLANNING AND MANAGEMENT (IPPM)

Integrated Project Planning and Management (IPPM) is a management process that meets cost and performance objectives by using cross functional teams, integrating all activities from product concept to field support and simultaneously optimizing the product and its manufacturing and support processes. It also incorporates a systematic approach to the early integration and concurrent application of all disciplines that play a part throughout a system's life cycle.

IPPM is based on the premise that the multi-functional disciplines inherent to acquisition agencies such as government and industry acquisitions are integral parts of project management and must be fully integrated to ensure successful deliveries. It focuses on the front end of the concurrent engineering process, early integration of key product/process characteristics and highly dependent on Science and Technology.

The IPPM technique integrates all acquisition activities in order to optimize system development, production, and deployment. IPPM provides a systematic approach to product development that achieves a timely collaboration of relevant stakeholders throughout the product life cycle to better satisfy customer needs. Key to the success of the IPPM concept are the Integrated Project Teams (IPTs), which are composed of qualified and empowered representatives from all appropriate functional disciplines who work together to identify and resolve issues.

IPT is a cross functional teams formed for the specific purpose of delivering a product for an external or internal customer in timely collaboration. It comprises a group of individuals who have complementary skills, committed to a common purpose, approach and performance objectives for which they hold themselves mutually accountable (Katzenbach and Smith, 1992). The Office of Government Commerce-OGC- (2008) has also defined the project team as a group of individuals with appropriate and complementary professional, technical or specialist skills who, under the direction of the project manager, are responsible for carrying out the work detailed in the project plan. The size of the team will of course depend on the nature of the work being undertaken.

According to Archibald (2009), one way to look at the project management discipline is to view it as consisting of these three basic principles:

- Assignment of integrative project responsibilities: the key integrative roles.
- Application of integrative and predictive project planning and control systems: the project documents, procedures, information processing and communication systems, and their application.
- Integrated project team-working: identifying, integrating, and managing the project team to integrate the efforts of all contributors to the project.

The objectives of Project Management are two-fold (Archibald, 2009):

- To assure that each project, when initially conceived and authorized, supports the organization's approved higher level strategic objectives and contains acceptable risks regarding the project's objectives: political, technical, cost and schedule.
- To plan, execute, and control each project simultaneously with all other projects effectively and efficiently so that each will achieve its approved objectives: meeting the related strategic objective by producing the specified results on schedule and within budget.

The first of these objectives is essential to the strategic management of the organization. Application of Project Management practices during the early strategic planning and project concept phases has been introduced in more organizations within the past few years, with beneficial results. Too frequently, project failures can be traced directly to unrealistic original technical, cost or schedule targets, and inadequate risk analysis and risk management.

Therefore, the above two project objectives can be accomplished when there is effective and efficient integration of functional systems, functional teams, projects, resources and stakeholders (internal and external). The purpose of Integrated Project Planning and Management (IPPM) is thus to establish and manage the project and the involvement of the relevant stakeholders according to an integrated and defined process that is tailored from the organization's set of standard processes.

Moreover, rather than attempt to manage individual projects as if they were stand-alone endeavours, executives have learned over the years that every project is always interrelated, primarily through the use of common resources, with some—if not all—other projects in the organization. Relating selected projects within a program is often a step in the right direction. Organizations have progressed from single project and program management to multiple project management, and they are now moving rapidly from **project management** to **integrated project portfolio management**.

Integrated Project Planning and Management (IPPM) involve the following activities:

- Establishing the project's defined process at project start-up by tailoring the organization's set of standard processes
- Managing the project using the project's defined process
- Establishing the work environment for the project based on the organization's work environment standards
- Establishing integrated teams that are tasked to accomplish project objectives
- Using and contributing to organizational process assets
- Enabling relevant stakeholders' concerns to be identified, considered, and, when appropriate, addressed during the development of the product
- Ensuring that relevant stakeholders perform their tasks in a coordinated and timely manner:
 - To address product and product component requirements, plans, objectives, problems, and risks,
 - To fulfil their commitments, and
 - To identify, track and resolve coordination issues.

Project's defined process refers to the integrated and defined process that is tailored from the organization's set of standard processes.

Managing the project's effort, cost, schedule, staffing, risks, and other factors is tied to the tasks of the project's defined process. The implementation and management of the project's defined process are typically described in the project plan. Certain activities may be covered in other plans that affect the project, such as the quality assurance plan, risk management strategy, and the configuration management plan.

Since the defined process for each project is tailored from the organization's set of standard processes, variability among projects is typically reduced and projects can more easily share process assets, data, and lessons learned.

The working interfaces and interactions among relevant stakeholders (internal and external to the project) are planned and managed to ensure the quality and integrity of the entire product. Relevant stakeholders participate, as appropriate, in defining the project's defined process and the project plan.

Reviews and exchanges are regularly conducted with relevant stakeholders to ensure that coordination issues receive appropriate attention and everyone involved with the project is appropriately aware of status, plans, and activities. In defining the project's defined process, formal interfaces are created as necessary to ensure that appropriate coordination and collaboration occurs.

The acquirer must involve and integrate all relevant acquisition, technical, support, and operational stakeholders. Depending on the scope and risk of the project, coordination efforts with the supplier can be significant.

Formal interfaces among relevant stakeholders take the form of memorandums of understanding, memorandums of agreement, contractual commitments, associated supplier agreements, and similar documents, depending on the nature of the interfaces and involved stakeholders.

This process area applies in any organizational structure, including projects that are structured as line organizations, matrix organizations, or integrated teams. The terminology should be appropriately interpreted for the organizational structure in place.

2.3.1: PROJECT'S DEFINED PROCESS AREAS

The project is conducted using a defined process tailored from the organization's set of standard processes. The project's defined process must include those processes from the organization's set of standard processes that address all processes necessary to acquire or develop and maintain the product. The product related lifecycle processes, such as manufacturing and support processes, are developed concurrently with the product.

a. Establish the Project's Defined Process

Establish and maintain the project's defined process from project start-up through the life of the project. The project's defined process consists of defined processes that form an integrated, coherent lifecycle for the project. The project's defined process logically sequences acquirer activities and supplier deliverables (as identified in the supplier agreement) to deliver a product that meets the requirements. The acquirer may require the supplier to align selected processes with the acquirer's defined process.

The project's defined process should satisfy the project's contractual requirements, operational needs, opportunities, and constraints. It is designed to provide a best fit for project needs. A project's defined process is based on the following factors:

- Customer requirements
- Product and product component requirements
- Commitments
- Organizational process needs and objectives
- The organization's set of standard processes and tailoring guidelines
- The operational environment
- The business environment

Establishing the project's defined process at project start-up helps to ensure that project staff and stakeholders implement a set of activities needed to efficiently establish an initial set of requirements and plans for the project. As the project progresses, the description of the project's defined process is elaborated and revised to better meet project requirements and the organization's process needs and objectives.

Also, as the organization's set of standard processes changes, the project's defined process may need to be revised.

The project's defined process is driven by the acquisition strategy. The acquirer's defined process is affected, for example, by whether the acquisition strategy is to introduce new technology to the organization or to consolidate acquired products or services in use by the acquirer.

b. Use Organizational Process Assets for Planning Project Activities

Use organizational process assets and the measurement repository for estimating and planning project activities. When available, use results of previous planning and execution activities as predictors of the relative scope and risk of the effort being estimated for the current acquisition.

c. Establish the Project's Work Environment

Establish and maintain the project's work environment based on the organization's work environment standards. An appropriate work environment for a project comprises an infrastructure of facilities, tools, and equipment that people need to perform their jobs effectively in support of business and project objectives.

The work environment and its components are maintained at a level of performance and reliability indicated by organizational work environment standards. As required, the project's work environment or some of its components can be developed internally or acquired from external sources.

The supplier's work environment should be compatible with the acquirer's work environment to enable efficient and effective transfer of work products. The work environment might encompass environments for both verification and validation or these might be separate environments.

d. Integrate Plans

Integrate the project plan and other plans that affect the project to describe the project's defined process. This specific practice extends the specific practices for establishing and maintaining a project plan to address additional planning activities such as incorporating the project's defined process, coordinating with relevant stakeholders, using organizational process assets, incorporating plans for peer reviews, and establishing objective entry and exit criteria for tasks.

The development of the project plan should account for current and projected needs, objectives, and requirements of the organization, customer, suppliers, and end users, as appropriate.

e. Manage the Project Using Integrated Plans

Manage the project using the project plan, other plans that affect the project, and the project's defined process.

f. Establish Integrated Teams

Establish and maintain integrated teams. The project is managed using integrated teams that reflect the organizational rules and guidelines for team structuring and forming.

The project's shared vision is established prior to establishing the team structure, which may be based on the WBS.

For small acquirer organizations, the whole organization and relevant external stakeholders can be treated as an integrated team.

One of the best ways to ensure coordination and collaboration with relevant stakeholders is to include them on an integrated team.

For projects within a system of systems framework, the most important integrated team may be with stakeholders representing other systems.

g. Contribute to Organizational Process Assets

Contribute work products, measures, and documented experiences to organizational process assets. This specific practice addresses collecting information from processes in the project's defined process.

2.3.2: COORDINATE AND COLLABORATE WITH RELEVANT STAKEHOLDERS

Coordination and collaboration between the project and relevant stakeholders are conducted.

a. Manage Stakeholder Involvement

Manage the involvement of relevant stakeholders in the project. Stakeholder involvement is managed according to the project's integrated and defined process. The supplier agreement provides the basis for managing supplier involvement in the project. Supplier agreements (e.g., inter-agency and inter-company agreements, memorandums of understanding, and memorandums of agreement) that the acquirer makes with stakeholder organizations, which may be product or service providers or recipients, provide the basis for their involvement. These agreements are particularly important when the acquirer's project produces a system that must be integrated into a larger system of systems.

b. Manage Dependencies

Participate with relevant stakeholders to identify, negotiate, and track critical dependencies.

c. Resolve Coordination Issues

Resolve issues with relevant stakeholders.

2.3.3: THE PROJECT IS MANAGED USING INTEGRATED PRODUCT AND PROCESS DEVELOPMENT (IPPD) PRINCIPLES

The purpose of IPPM is to create an IPPD environment that enables integrated teams to efficiently meet the project's requirements and produce a quality product.

a. Establish the Project's Shared Vision

Establish and maintain a shared vision for the project. A project does not operate in isolation. Understanding organizational mission, goals, expectations and constraints allows the project to align its direction, activities, and shared vision with the organization and helps create a common purpose within which project activities can be coordinated. To enable this, it is critical to understand the interfaces between the project and stakeholders external to the project and the objectives and expectations of all relevant stakeholders (internal and external).

When creating a shared vision, consider:

- External stakeholder expectations and requirements the aspirations and expectations of the project leader, team leaders, and team members
- The project's objectives
- The conditions and outcomes the project will create interfaces the project needs to maintain
- The visions created by interfacing groups
- The constraints imposed by outside authorities (e.g., environmental regulations)
- Project operation while working to achieve its objectives (both principles and behaviours)

When creating a shared vision, all people in the project should be invited to participate. Although there may be a draft proposal, the larger population must have an opportunity to speak and be heard about what really matters to them. The shared vision is articulated in terms of both the core ideology (values, principles, and behaviours) and the desired future to which each member of the project can commit.

An effective communications strategy is a key to implementing and focusing the shared vision throughout the project. Promulgation of the shared vision is a public declaration of the commitment of the project to their shared vision and provides the opportunity for others to examine, understand, and align their activities in a common direction. The shared vision should be communicated, and agreement and commitment of the relevant stakeholders should be obtained.

Effective communications are also especially important when incorporating new project members. New members of the project often need more or special attention to ensure that they understand the shared vision, have a stake in it, and are prepared to follow it in doing their work.

b. Establish the Integrated Team Structure

Establish and maintain the integrated team structure for the project.

Product requirements, cost, schedule, risk, resource projections, business processes, the project's defined process, and organizational guidelines are evaluated to establish the basis for defining integrated teams and their responsibilities, authorities, and interrelationships.

A typical integrated team structure may be based on the product oriented hierarchy found in the WBS. More complex structuring occurs when the WBS is not product oriented, product risks are not uniform, and resources are constrained.

The integrated team structure is a dynamic entity that is adjusted to changes in people, requirements, and the nature of tasks, and to tackle many difficulties. For small projects, the integrated team structure can treat the whole project as an integrated team. The integrated team structure should be continuously monitored to detect malfunctions, mismanaged interfaces, and mismatches of the work to the staff. Corrective action should be taken when performance does not meet expectations.

c. Allocate Requirements to Integrated Teams

Allocate requirements, responsibilities, tasks, and interfaces to teams in the integrated team structure. This allocation of requirements to integrated teams is done before any teams are formed to verify that the integrated team structure is workable and covers all the necessary requirements, responsibilities, authorities, tasks, and interfaces. Once the structure is confirmed, integrated team sponsors are chosen to establish the individual teams in the structure.

d. Establish Integrated Teams

Establish and maintain integrated teams in the structure. The integrated teams within the integrated team structure are established by the team sponsors. This process encompasses choosing team leaders and team members, and establishing the team charter for each integrated team based on the allocation of requirements. It also involves providing the resources required to accomplish the tasks assigned to the team.

e. Collaboration among Interfacing Teams

Ensure collaboration among interfacing teams. The success of an integrated team-based project is a function of how effectively and successfully the integrated teams collaborate with one another to achieve project objectives. This collaboration may be accomplished using interface control working groups.

2.3.4: ACHIEVE SPECIFIC GOALS

The process supports and enables achievement of the specific goals of the process area by transforming identifiable input work products to produce identifiable output work products.

a. Perform Specific Practices

Perform the specific practices of the integrated project management process to develop work products and provide services to achieve the specific goals of the process area.

b. Institutionalize a Managed Process

The process is institutionalized as a managed process.

2.3.5: INSTITUTIONALIZE A DEFINED PROCESS

The process is institutionalized as a defined process.

a. Establish an Organizational Policy

Establish and maintain an organizational policy for planning and performing the integrated project management process.

This policy establishes organizational expectations for establishing and maintaining the project's defined process from project start-up through the life of the project, using the project's defined process in managing the project, and coordinating and collaborating with relevant stakeholders.

b. Plan the Process

Establish and maintain the plan for performing the integrated project management process. This plan for the integrated project management process unites the planning for the project planning and monitor and control processes.

The planning for performing the planning-related practices in Integrated Project Management is addressed as part of planning the project planning process. This plan for performing the monitor-and control- related practices in Integrated Project Management can be included in (or referenced by) the project plan, which is described in the Project Planning process area.

c. Provide Resources

Provide adequate resources for performing the integrated project management process, developing the work products, and providing the services of the process.

d. Assign Responsibility

Assign responsibility and authority for performing the process, developing the work products, and providing the services of the integrated project management process.

e. Train People

Train the people performing or supporting the integrated project management process as needed.

f. Manage Configurations

Place designated work products of the integrated project management process under appropriate levels of control.

g. Identify and Involve Relevant Stakeholders

Identify and involve the relevant stakeholders of the integrated project management process as planned.

h. Monitor and Control the Process

Monitor and control the integrated project management process against the plan for performing the process and take appropriate corrective action.

i. Objectively Evaluate Adherence

Objectively evaluate adherence of the integrated project management process against its process description, standards, and procedures, and address non-compliance.

j. Review Status with Higher Level Management

Review the activities, status, and results of the integrated project management process with higher level management and resolve issues.

k. Collect Improvement Information

Collect work products, measures, measurement results, and improvement information derived from planning and performing the integrated project management process to support the future use and improvement of the organization's processes and process assets.

2.3.6: INSTITUTIONALIZE A QUANTITATIVELY MANAGED PROCESS

The process is institutionalized as a quantitatively managed process.

a. Establish Quantitative Objectives for the Process

Establish and maintain quantitative objectives for the integrated project management process, which address quality and process performance, based on customer needs and business objectives.

b. Stabilize Subprocess Performance

Stabilize the performance of one or more sub processes to determine the ability of the integrated project management process to achieve the established quantitative quality and process-performance objectives.

2.3.7: INSTITUTIONALIZE AN OPTIMIZING PROCESS

The process is institutionalized as an optimizing process.

a. Ensure Continuous Process Improvement

Ensure continuous improvement of the integrated project management process in fulfilling the relevant business objectives of the organization.

b. Correct Root Causes of Problems

Identify and correct the root causes of defects and other problems in the integrated project management process.

2.4: PROJECT CLEARANCE REPORT (PCR)

Comprehensive study guidelines have been prepared by different organizations such as the United Nations Industrial Development Organization (**UNIDO**), World Bank (**WB**), Institution of Monetary Fund (**IMF**), national organizations concerned with national economic development and planning, etc

Whenever project is identified it is often done with reference to the countries development strategies and economic policies. Therefore, even if a private entrepreneur is identifying a project, the project must serve to fulfill the social and economic need of the country. This has to pass through **at least** the under mentioned three stages of scrutiny and clearances (Choudhury, 1988; Joy, 1994).

Government may have a three-stage project scrutiny. These three stages are often known as:

- First stage: Pre Feasibility Report (**PFR**)
- Second stage: Techno-Economic Feasibility Report (**TEFR**)
- Third stage: Detailed Project Report (**DPR**)

2.4.1: PRE FEASIBILITY REPORT (ALSO CALLED PROJECT FORMULATION REPORT OR PROJECT OPPORTUNITY STUDY REPORT)

PFR is a document that elicits the preliminary sanctions of the first stage clearance by the government and this has a specified outline to supply information. Industry practices is that the same pro forma is being used for all the aforementioned three stages of scrutiny but information gets refined by and by at its stage.

The objective of this scrutiny is to ensure that the project is viable from various angles:

- Market demand for the project or a product exist
- Plant capacity
- Materials and inputs used
- Location and site
- Project engineering and investment cost
- Plant organization and over head cost
- Manpower requirement
- Implementation schedule
- Financial and economic evaluation
- Statutory clearances

Along with this, project cost estimates are also submitted. Industry collects historical estimates and adjusts for escalation, inflation, local factors, etc which may be based on statistics and experiences. If no previous experience of having such experience, consultants are hired for this purpose.

PFR is evaluated by various agencies from various angles. Each of them gives their individual clearances, record their objection, or get rectifications made (ask for further explanation). And this grants the first stage clearance is over.

Once getting clearance from the first stage (PFR), it moves to the second stage (TEFR).

2.4.2: TECHNO-ECONOMIC FEASIBILITY REPORT (TEFR)

In this stage, project scope is defined, capacity or size is identified, and also the method to be used is determined.

2.4.3: DETAILED PROJECT REPORT (DPR)

This is the last and most important stage for project pre investment phase. The **DPR** and Detailed Cost Estimates (**DCE**) are together for scrutiny and clearance. The outline and the items for DPR remains the same as TEFR; however, the level of accuracy increases because this is a period only when basic engineering, process design, and equipment listing is complete.

To prepare DPR from the TEFR:

- Breakdown all the project components, time phase them, schedule them, with accurate cost estimates along with explanations by giving reasons for your assumptions and calculations.
- Develop base line for controlling time and cost during the implementation of the project components.
- Prove preparedness with all the technical and resource requirements to implement the project.

2.5: MANAGEMENT APPROACH TO PROJECT CYCLE

From identification through evaluation of the project cycle is a process that can and should be managed. Management has been traditionally associated with the implementation phase and often equated with the efficiency with which this activity has been carried out. The management aspect, however, is not restricted to implementation but includes all stages of project cycle.

The five managerial functions (planning, organizing, staffing, directing, and controlling) shall be applied for accomplishing each successive project cycle. Each successive cycle calls for a distinctive planning of its activities to be done; organizing of its structure, planned activities and the various resources required; staffing of its structure with the right people who are fit for the purpose; directing of its people involved in towards attaining the set goals; and controlling (monitoring and evaluating) of its performance so that to take corrective as well as preventive measures when needed.

Therefore, each project cycle has to be managed; it is a process for decision-making, not an end in itself. As more information is gathered during the various phases, the project is modified and reshaped, with consequent changes in its cost estimates, implementation schedule, and so on. The process may also identify additional projects that overlap and interlock with the initial proposal.

As noted above, the cycle is an iterative process consisting of a series of decisions. Each phase is logically separated from the rest by a decision point. At each decision point, the project can be dropped, forwarded to the next phase, or recycled back to the previous one for restructuring and refining.

A report is usually prepared at the end of each phase. The report might include an analysis for decision-making, prospective budget and work plan for the next phase and elementary plan for the whole cycle. As the project progresses throughout various phases, those summary master plans can be refined with evermore detail and revised to take account of new and more comprehensive information.

2.6: CHAPTER SUMMARY

Project management is an integrated and interdependent function. The success or failure of one activity of a project affects other activities. The interactions between the various components of project management can be direct and clearly defined, or they can be ambiguous. For instance, a slight change in the scope of the project will certainly change the cost of the project but it is difficult to determine whether it will have an impact on the team motivation and quality of the end product. For a project to be successful there has to be a balance between the various objectives of the project, because to enhance performance in one area, performance in another area may have to be sacrificed.

Project management processes can be split into three, four, five or six stages- called the project life cycle- with respect to special nature of the project.

The components of the project cycle go through specific interaction patterns that contribute to the success of the individual processes and the project as a whole. A given processes and the interaction between their components is not applicable to all projects, thus, the project processes can be customized as per the requirements of the project.

2.7: CHAPTER END ACTIVITIES AND QUESTIONS

- i. By taking an “Elementary School Construction” project of your environment:
 - a) Short list the series of activities to be involved from its project idea generation up to implementation and
 - b) Classify these activities as identification, preparation, appraisal, implementation, and evaluation.
- ii. One of your friends argues that project cycle need to be managed. Do you agree? If yes, Why? Who? Where? When? How?
- iii. Assume that you are a project manager for one of the elementary school under construction in your environment. Assume also that your project is in the cleaning phase. Therefore, shortlist the series of activities you have to take for cleaning the project (i.e., to exit from the project).

CHAPTER THREE: PROJECT IDENTIFICATION

INTRODUCTION

Project identification is the first and, perhaps, the most crucial stage of both project cycles. It is from this idea that the project will be based, and a poor idea or lack of ideas is likely to lead to poor or no projects. The initial project idea may be made in rather general or sketchy terms, and different versions of the same project may be conceived. It is at this stage that an initial screening of project ideas will take place, with some project ideas being abandoned as impractical or of a low priority. Ideas for projects can come from a range of different sources and organizations including ministries, individuals, local communities, non-government organizations, and donor and international agencies.

There will usually be more project ideas and wishes- than resources to implement them, and therefore only small portions of these are ever likely to lead to the full implementation of an actual project. Mechanisms are therefore needed not only to identify different project ideas, but also to put these priorities for development and eventual implementation. This section discusses these issues: who identifies project ideas, how to prioritize projects, and the different roles of governments, parastatals, private sector, NGOs and local communities in this process.

As it has been discussed in Chapter Two, different guidelines, manuals, and authors have classified project phases in to different number of phases and called them by different names. Irrespective of the number of phases and names, we need to understand a project, from its conception to completion, through its major activities. However, in order to make project management study's structured, this text pursue the Baum's five phase project management cycle: identification (**Chapter 3**), formulation (**Chapter 4 and 5**), appraisal (**Chapter 6 - 9**), implementation planning and organizing (**Chapter 10**), and implementation monitoring and evaluation (**Chapter 11**). This classification helps handle each of these phases with meticulous cost-benefit considerations and consciousness of time, cost and quality for project's success.

LEARNING OBJECTIVES

After studying this chapter, you should be able to:

- Distinguish sources of project ideas
- Differentiate methods of project identification
- Understand project selection criteria

3.1: PROJECT IDENTIFICATION

Project identification is the findings of project that could contribute towards achieving specific development objectives. Often, project ideas should, in general, aim at overcoming constraints on the national development effort.

3.1.1: PRE-IDENTIFICATION

It is an important prelude to project identification. This pre-identification stage involves surveying, reviewing, inventorying, integration and analysis of strategies and policies, natural resources data and socio-economic information.

While a good data base is a prerequisite to sound project formulation. While the analysis of data will identify gaps and throw up ideas for possible projects, project identification must be carried out also within a framework of national, regional, and sector development (including pricing, taxation, and subsidy) policies, otherwise much time and effort might be wasted in identifying and preparing projects which would be rejected on policy grounds or which might turn out to be unfeasible because of, for instance, tax and subsidy policy. Thus, those who are responsible for identifying projects need to be aware of accepted strategies and policies.

3.1.2: IDENTIFICATION

Having a reasonable database and development strategies and policies have been formulated in sufficient detail to be operationally useful, how do we then set about identifying projects? The bases for project identification:

Projects are identified where there is a demand for the output of the project and where it is thought that the resources can be made available to satisfy the demand. A distinction is sometimes made between **demand-based** projects and **resource-based** projects. Where projects are not undertaken for commercial objectives, the project may be **need-based** (Gizaw, 2003).

Demand for project output may be reflected in terms of:

- Local consumer demand for the product (goods or services)
- Export opportunities
- Demand for intermediate inputs into other sectors/activities

Incorrect assumptions about the size of future demand or the price at which products can be sold can cause problems of either inadequate or excess capacity that can be difficult or expensive to rectify.

Resource-based identification is often important for the development of agro-industries. Many agro-industrial projects are identified because of existing production of agricultural raw materials or the availability of land that is suitable for their production. Surveys of land capability may lead to the identification of potential new areas of economic activity. Agro-industrial projects involve the matching of raw material supply with processing capacity and so they may involve more than one project or a project having two or more components.

Need-based projects are most common in the social sectors where requirements for health and education facilities or support facilities for unemployed workers are related to an assessment of need. Normally the distinction between demand and need is based on whether or not the output of a particular activity is sold on a commercial basis. In this respect some infrastructure projects are also identified on a need basis, although the need may be defined using a similar approach to the projection of demand for a commercial project.

There are essentially two complementary approaches to be followed in generating ideas. Assessment of the supply and demand side helps identify feasible project ideas.

First, find out what the nation wants and needs in order to improve quality of their lives. This grass roots level approach is the essence of good bottom-up planning, and is essential if we want to reach the really poor and needy in the rural areas. It does not follow that **what people say they want** or **what is good for them** is always sound. But, we should at least take the trouble to ask people what they want, listen carefully to what they say and try as far as possible to see how their ideas can be fitted into the available resources, strategies and policies, taking into account physical, human, institutional, and financial constraints.

Second, look at the existing situation in respect to the demand and supply of goods and services and to look at past trends and likely future trends. Some of the questions that have to be raised during such assessment are illustrated below:

Questions on the Supply Side

- Is the existing product produced for subsistence needs or for sale or for both?
- What are the possibilities for improving the subsistence production and increasing out put for sale?
- What products are not being produced in sufficient quantities in terms of the resource available?
- What are the most important constraints inhibiting a faster growth? Etc.

Questions on the Demand Side

- What are the markets for the goods and services currently being produced?
- What are the prospects for entering other markets?
- What are the possibilities for import substitution?
- What are the possibilities for export substitution?
- What are the possibilities for increasing existing exports or developing new export items?
- Are pricing, tax, and subsidy policies conducive to increased production and exports? Etc.

Exhibit 3.1: Phases of Project Identification

There are four key phases of project identification. These are:

- **Actual Project Identification-** The generation of project ideas by formal and informal institutions and individuals.
- **Description of Project Idea-** An actual written description of the project idea or concept, summarizing the main elements of the proposed project to use in the screening, ranking and prioritization of project ideas.
- **Screening-** An initial review of project ideas and concepts to see if they should be advanced or abandoned at an early stage.
- **Prioritization-** The ranking and selection of projects against a set of criteria to identify the “best” projects to move actively into the designed stage and development.

Activity 3.1: By studying your working environment, generate and identify one development project each from both demand and supply side by providing brief justification.

3.2. SOURCES OF PROJECT IDEAS

How to come up with a project before grasping to project preparation? Usually there are two major levels where project ideas are originated- the macro and micro level (DEPSA, 1981, 1990; Gizaw, 2003; MEDAC, 1996).

3.2.1: MACRO LEVEL- Project ideas may emanate from:

- National, sector or regional plans
- Constraints in the development process due to shortage of essential infrastructure facilities
- Government's decision to correct social and regional inequalities or to satisfy basic needs of the people through development projects.
- Possible external threat that necessitates projects aiming at achieving, for example, self-sufficiency in basic materials, energy, transportation, etc
- Unusual events such as droughts, floods, earthquakes, etc.
- Government decision to create locally project-implementing capacity in such areas as construction, etc.
- Multilateral or bilateral development agencies.
- Regional or international agreements in which a country participates.

3.2.2: MICRO LEVEL- Project ideas may emerge from:

- Existence of unused or under utilized natural and human resources and the perception of opportunities for their efficient use
- Identification of unsatisfied demand or needs
- Need to remove shortage in essential materials, services, or facilities that constrain the development effort.
- Initiative of private or public enterprises in response to incentives provided by the government
- Necessity to complement or expand investments previously undertaken
- Desire of local groups or organizations to enhance and improve their welfare.

During identification, the analyst should eliminate project proposals that:

- Are technically unsound and risky
- Have no market for the out put
- Have inadequate supply of inputs
- Are very costly in relation to benefits
- Assume over ambitious sales and profitability, etc.

As a result, some of the project alternatives will be rejected and those that are promising will be advanced to the next stage called project preparation. In general, by the end of the identification stage, mainly, we should know:

- Whether further detailed work is justified?
- What major issues have been identified? What project alternatives have been considered? Which of them have been rejected? Etc.
- Rough estimate of costs for projects that still look promising, a specific work plan for the next stage should also be included in the study.

Activity 3.2: By analysing your environment, identify one development project each at macro and micro level with brief justification.

3.3: WHO IDENTIFIES PROJECTS?

Projects can be identified by many different agencies depending on the type of project under consideration. Projects might be identified by (Chandra, 2006; Gizaw, 2003):

- Small producers' organizations
- Large scale individual private sector producers
- Product marketing organizations
- Private sector companies (Local and Foreign)
- State owned enterprises and organizations
- Government ministries
- Development banks
- Other aid agencies
- Local government
- Local politicians and pressure groups, etc.

Projects can be identified by institutions on the information they hold and receive. This information can be formal surveys and reviews, or it can be informal, e.g., local peoples' views and opinions. The main formal information sources of project ideas for the agricultural sector, for example, are (Gittenger, 1998; Gizaw, 2003):

- Policy reviews and development plans made by federal government ministries
- Sector surveys by technical ministries
- Survey conducted by local government (district and regional) and other regional organizations
- Formal problem diagnosis and analysis exercises
- Environmental and natural resource surveys
- Reviews and evaluations of past projects
- Community meetings and public gatherings
- Participatory rural appraisal and participatory development programs
- Private sector, co-operative and parastatal corporate plans
- Investment identification missions by development and other aid donors, etc.

Activity 3.3: Do you believe that your mother and father can generate a development project idea? If yes, share your experience by giving an example. If no, why? Explain in brief.

3.4: PROJECT CONCEPTS AND PROFILES

Once a project idea has been conceived, the next stage is to describe the idea so that it can be prioritised and move on to the next stage in the process. This may involve the preparation of a project identification report or project concept or profile. It might be part a more general sector or regional planning exercise or the result of participatory approach at the village level by a district officer. Whenever it is developed, it is essential to have a clear idea of what the proposed project is supposed to be and what are the hopes to achieve. A project concept or profile should be short and can sometimes be only a couple of pages. It should include answers to the questions given in **Exhibit 3.2**.

Exhibit 3.2: Questions on Project Profile or Concept (Gizaw, 2003)

JUSTIFICATION AND PURPOSE

- What goal is the project contributing to?
- What is the purpose of the project, what does it intend to achieve?
- What problem is the project addressing?
- What is the justification of the project?
- What demands, needs or opportunities is the project addressing?
- What are the main alternative ways for meeting the project's objectives?
- What existing information sources were, or can be used, in identifying and developing the project?

BENEFICIARIES AND STAKEHOLDERS

- Who will benefit from the project?
- Who identified the project?
- Who has a share or stake in the project?
- Who will be positively, and negatively, affected by the project?
- How have project beneficiaries and other stakeholders participated in the identification of the project?
- Which institutions are the targets of the project?

RESOURCE AND INSTITUTIONS

- What potential resources may be available for implementing the project?
- Which organizations are to be involved in project planning and implementations?

POLICIES AND PLANS

- How does the project proposal fit into any sector or regional plans?
- Does the project fit into current policies?

IMPACTS

- What are the likely major positive and negative social impacts of the project?
- What are the likely positive and negative environmental impacts of the project?

SUPPORT

- What is the level of political and administrative support for the project?
- Does the project have the support of beneficiaries and/or local communities?

RISKS

- What are the chances of the project achieving its objective?
- What are the main risks associated with the project?
- What assumptions have been made, e.g., what support is needed for others?

The conceptualisation stage of the project can be very important. It is at this early stage when alternative strategies can be examined most easily. As project preparation proceeds, it becomes more and more difficult to alter the fundamental project design. It is also important that the initial identification or project concepts give consideration to all possible options. Careful work at this stage can help not just in ensuring that good project proposals work, but also in rescuing or amending proposals that might otherwise have been disasters.

3.5: PRIORITIZATION AND RANKING

The limited resources available mean that effective project identification and selection at various levels will be essential. There will be more ideas for potential projects than resources available. This will occur at all levels from community-based projects to national based projects. Even individual farmers will have to allocate resources between **‘personal’ projects** on their own farms, even when there is no outside intervention and support.

At the national level different agencies and divisions within ministries will have their own project ideas and will have to compete for support and resources. To decide which projects to support, it will be necessary to set priorities. This calls for the ranking of projects. But how are projects to be ranked, and who is to do this? A set of criteria against which project can be ranked needs to be established; these criteria will vary depending upon the level of a project. The criteria of a village in selecting projects will be different from that of the ministry of agriculture. Criteria include social, economic, financial and environmental factors. Potential criteria for ranking projects are given in **Exhibit 3.3**.

Exhibit 3.3: Examples of Criteria for Ranking Projects (Gizaw, 2003)

<p>EXTENT</p> <ul style="list-style-type: none">▪ Number of people affected by the project▪ Geographic area affected by the project <p>ECONOMIC AND FINANCIAL</p> <ul style="list-style-type: none">▪ Potential economic benefits to the country or region▪ Potential financial benefits to farmers and local communities <p>ENVIRONMENTAL</p> <ul style="list-style-type: none">▪ Conservation of natural resources and more sustainable land use▪ Protection of natural resources (e.g., forests) <p>SOCIAL</p> <ul style="list-style-type: none">▪ Poverty alleviation▪ Assistance to disadvantaged groups <p>POLICY</p> <ul style="list-style-type: none">▪ Is the project in line with national policies? <p>RESOURCES</p> <ul style="list-style-type: none">▪ Availability of human resources to implement project▪ Likely availability of funding from government, NGO and/or donors <p>SUCCESS OR FAILURES</p> <ul style="list-style-type: none">▪ What are the chances of the project successfully meeting its objectives?▪ What degrees of the risks are associated with the project that may affect its implementation? <p>SUPPORT</p> <ul style="list-style-type: none">▪ Political support for project▪ Community support and demand for project
--

During selection process, each project can be assessed against each of the criteria to give a rating. At this stage of the project cycle this is more likely to be qualitative than quantitative. Certain criteria can be given greater weighting to reflect the importance of the criteria in determining the overall rank of the project.

Activity 3.4: Assume that you are kindly requested to give your project expertise on two project ideas identified by your municipality. These are rent-house and high school construction. Therefore, define these two projects in terms of your regional government policies and plans, and rank the projects in terms of the resource available.

3.6: IDENTIFICATION OF COMMERCIAL PROJECT IDEAS

3.6.1: PRESCRIPTIONS FOR FOSTERING ORGANIZATIONAL CREATIVITY

Organizational leaders can cultivate institutional creativity for commercial project idea generation through (Chandra, 2006):

- Develop an acceptance for change.
- Encourage new ideas.
- Permit more interaction.
- Tolerate failure
- Provide clear objectives and freedom to achieve them
- Offer recognition, Etc.

3.6.2: SCOUTING FOR PROJECT IDEAS

Good project ideas (the key to success) are elusive. So, a wide variety of sources should be tapped to identify them. Here are some of the suggestions in this regard (Chandra, 2006; ICMR, 2007; Meredith and Mantel, 2006):

- Analyze performance of existing industry.
- Examine input and output of various industries.
- Review imports and exports (this is helpful to understand, say, the trend of imports of various goods and the potential for import substitution).
- Study plans outlay and government guidelines.
- Look at the suggestions of financial institutions and development agencies.
- Investigate local material and resources.
- Analyze economic and social trend.
- Draw clues from consumption abroad.
- Study new technological development.
- Explore the possibility of reviving sick units.
- Identify unfulfilled psychological needs.
- Attend trade fairs, etc.

3.6.3: PRELIMINARY PROJECT IDEA SCREENING

Preliminary screening is required to eliminate ideas that are not promising from beginning. The following six dimensions should be considered for preliminary project idea screening (Chandra, 2006; ICMR, 2007; Meredith and Mantel, 2006):

a. Compatibility with promoter

The idea must be compatible with the interest, personality, and resources of the entrepreneur, i.e.

- It must fit the personality of the entrepreneur.
- It must be accessible to the entrepreneur.
- It must offer the entrepreneur the prospect of rapid growth and high return on investment.

b. Consistency with governmental priorities

- Is the project consistent with national goals and priorities?
- Is there any environmental effect contrary to government regulations?
- Can the foreign exchange requirements of the project be easily accommodated?
- Will there be any difficulty in obtaining the license for the project?

c. Availability of inputs

The input requirements, their availability and cost should be considered. Resources and inputs required must be reasonably assured, i.e.

- Capital needs
- Technical know how
- Raw material
- Power, etc.

d. Adequacy of the market

The size of the present market must offer the prospect of adequate sales volume, potential for growth, and a reasonable return on investment. To check adequacy, see for:

- Present and future demand
- Market share of own and competitor
- Domestic and export market
- Quality-price relationship vis-à-vis competitive products
- Economic, social, demographic trends for demand
- Barriers to the new entry, sales and distributions system, patent protection, projected increase in consumption, etc.

e. Reasonableness of cost

Cost structures (RM, Labor, FOH, Administration, Selling and Distribution, etc) of the proposed project must enable it to realize an acceptable profit with a competitive price.

f. Acceptance of level of risk

To ascertain degree of risk involved, the following factors should be considered:

- Vulnerability to business cycle
- Change in technology
- Competition from substitute
- Competition from imports
- Government control over price and distribution, etc.

3.6.4: PROJECT RATING INDEX (PRI)

When large numbers of project ideas are generated, we need preliminary screening to judge whether the project is primarily worthwhile or not. The **PRI** streamlines the process of preliminary screening (see **Exhibit 3.4**). The steps are (ICMR, 2007; Meredith and Mantel, 2006):

- i. Identify factors relevant for project rating.
- ii. Assign weights to the factors (the weights are supposed to reflect their relative importance).
- iii. Use suitable rating scale (say, a five or seven point scale).
- iv. Rate the project proposal on various factors.
- v. Multiply each factor rating with factor weight. This gives score for the factor.
- vi. Add factor scores. This gives an overall project-rating index.
- vii. Compare the overall project-rating index (step no.6) against the predetermined hurdle value (cut-off point).
- viii. If equal or more accept or else reject the project.

Exhibit 3.4: Construction of Preliminary Rating Index (PRI)

Step 1	Step 2	Step 3 & 4					Step 5
Factors	Factor Weight	FIVE POINT RATING SCALE					Factor Score
		(5) V.G	(4) Good	(3) Ave.	(2) Poor	(1) V.P	
Input availability	0.25			√			0.25*3=0.75
Technical know how	0.10		√				0.10*4=0.40
Reasonableness of cost	0.05		√				0.05*4=0.20
Adequacy of market	0.15	√					0.15*5=0.75
Stability	0.10		√				0.10*4=0.40
Complementary relationship with other products	0.05		√				0.05*4=0.20
Dependence on firm's strength	0.20	√					0.20*5=1.00
Consistency with government priorities	0.10			√			0.10*3=0.30
	1.00	Step 6 → Rating Index (Σ) = 4.00					

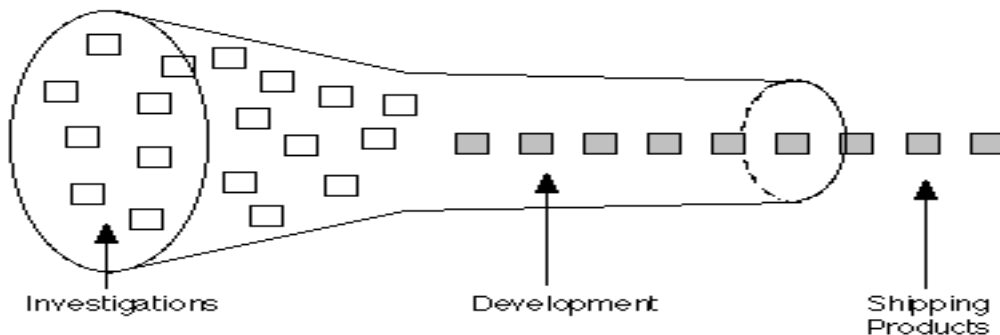
When screening ideas, the project manager must avoid two types of errors: drop-error and go-error. Drop-error occurs when a good idea is rejected and go-error occurs when a poor idea identified for further development.

Activity 3.5: Discuss in brief the need for conducting project idea rating index by giving an illustration.

3.6.5: DEVELOPMENT FUNNEL

According to Wheelwright and Clark (1992), an alternative technique for eliminating many insignificant projects ideas from the critical few that the organization can realistically consider is the **Development Funnel** (see **Figure 3.1**). The **investigation stage** is a crude screen that checks for impact on the strategic goal. Subsequent screens apply other criteria when more data are available. Any number of screens may be applied until the project team is satisfied that the remaining projects relate to compelling business needs. These steps actually save time because the project formulation stage can get quiet extensive if all possible projects go through this funnel tube.

Figure 3.1: The Development Funnel Tube



The aim of any product or process development project is to take an idea from concept to reality by converging to a specific product that can meet a market need in an economical, manufacturability form. The overall development process starts with a broad range of inputs and gradually refines and selects from among them, creating a handful of formal development projects that can be pushed to rapid completion and introduction. This notion can be illustrated as a converging funnel (above).

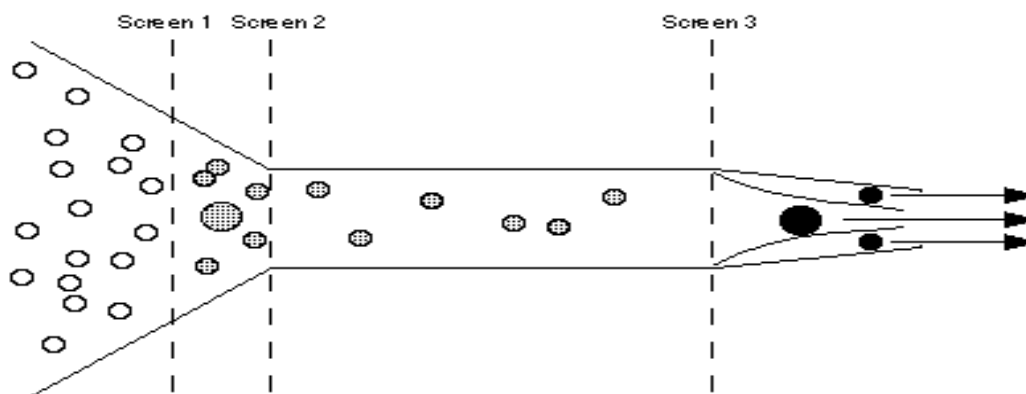
In its simplest form, the development funnel provides a graphic structure for thinking about the generation and screening of alternative development options, and combining a subset of these into a product concept. A variety of different product and process ideas enter the funnel for investigation, but only a fraction become part of a full-fledged development project.

Managing the development funnel involves three very different tasks or challenges. The first is to widen the mouth of the funnel- the organization must expand its knowledge base and access to information in order to increase the number of new product and new process ideas. The second challenge is to narrow the funnel neck- ideas generated must be screened and resources focused on the most attractive opportunities.

The goal is not just to apply limited resources to selected projects with the highest expected payoff, but to create a portfolio of projects that will meet the business objectives of the firm while enhancing the firm's strategic ability to carry out future projects. The third challenge is to ensure that the selected projects deliver on the objectives anticipated when the project was approved.

There are two dominant models of the Development Funnel (Wheelwright and Clark, 1992). These models (Model 1 and Model 2) are broad patterns showing the kinds of choices firms have to make.

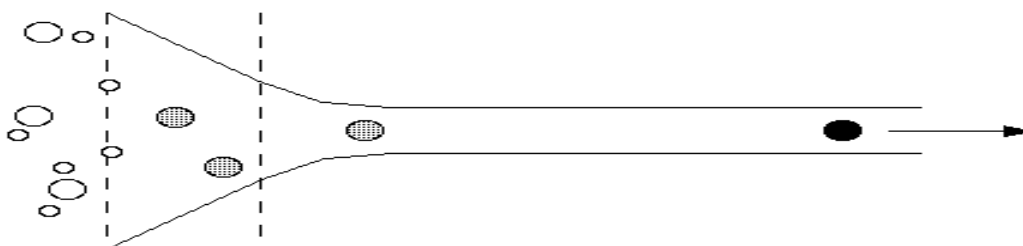
Figure 3.2: Model 1- Development Funnel Tube



Model 1 (**Figure 3.2**) is common in larger, technology intensive firms who rely primarily on their Research and Development group to generate ideas for technologies, products and processes.

Encouragement is given to generate many more ideas than will be applied, and these are then screened in various ways and at various stages.

Figure 3.3: Model 2- Development Funnel Tube



Model 2 (**Figure 3.3**) is a top down model common in small, entrepreneurial start-ups, in which the firm bets on a single project. In both illustrations the circles represent new products; shading indicates the extent of development, and size the scale of the project.

3.7: CHAPTER SUMMARY

Project ideas are generated through different sources like customers, competitors, and employees. Sometimes they are discovered through accident. Project manager should try to enhance people's creativity, scan the entire business environment and appraise the company's strengths and weaknesses to generate a large number of ideas. Techniques like attribute listing, brainstorming, and Delphi technique are useful for improving the creativity at individual and group level.

The project manager should analyze the business environment that consists of the economic sector, the governmental sector, the technological sector, the socio-demographic sector, the competition sector and the supplier sector. Once a pool of ideas has been generated, the project manager should carefully screen them. The Project Rating Index method or the development funnel tube helps a manager eliminate poor ideas in the initial screening process.

3.8: CHAPTER END ACTIVITIES AND QUESTIONS

- a) Briefly discuss the rationale for project identification.
- b) A project consultant advises that when a project is identified, it must be fit to the government priorities. Do you agree? Why?
- c) Generate three development project ideas that are catering to your environment's social problem with brief justification. Accordingly:
 - i. Set a factor/criterion that enables you to select one best project idea.
 - ii. Assign factor weights out of 100%.
 - iii. Set your minimum cut-off rate for accepting or rejecting the project.
 - iv. Using the Preliminary Rating Index (PRI), rate the alternative project ideas.
 - v. Rank the projects and select one best idea with brief explanation.

CHAPTER FOUR: PROJECT PREPARATION (FORMULATION)

INTRODUCTION

If the project is believed to be viable during identification and pre-feasibility studies, it enters into the feasibility study stage. The feasibility study should provide all data necessary for an investment decision.

Market, technical and institutional feasibility, commercial profitability and social cost-benefit analysis which are prerequisites for an investment project should be defined and critically examined on the basis of alternative solutions already reviewed in the pre-feasibility study.

A feasibility study should be prepared in a scope that it should not omit any essential part. If feasibility study is prepared meaningfully, the project appraiser cannot complain of the lack of data or imperfect analysis and the decision makers cannot find any thing hidden and missing.

The number of dimensions that the project feasibility study should look in to while formulating the project idea is numerous. This chapter, however, introduces the major ones and the subsequent four chapters deal in detail on the financial feasibility (**Chapter 6**), economic feasibility (**Chapter 7**), environmental feasibility (**Chapter 8**) and gender feasibility (**Chapter 9**).

LEARNING OBJECTIVES

After studying this chapter, you should be able to distinguish the different aspects of project feasibility studies such as the:

- Market analysis,
- Technical and institutional analysis,
- Financial analysis,
- Social cost-benefit,
- Gender analysis,
- Environmental analysis, etc.

4.1.1. PROJECT PRE-FEASIBILITY AND FEASIBILITY STUDY

The starting point for preparing any project approved in principle is the pre-feasibility study carried out at the identification stage.

According to Gittenger (1998), pre feasibility study is the assessment of a project whether there is a need for further study (to screen out the bad and the not-so promising ideas). The written culmination of the pre-feasibility exercise is called **project identification brief**. Project identification brief identifies the constraints and the means for overcoming them and makes the rough and ready assessment of the costs and benefits.

4.1.2. OBJECTIVES OF PRE-FEASIBILITY STUDY

- To examine possible alternatives that are emanated in pre feasibility studies
- To determine whether future analysis is justifiable
- To undertake supporting studies, such as environmental impact, laboratory test, equipment selection, etc.

4.1.3. CONTENT OF PRE-FEASIBILITY STUDY

To enable the relevant authorities to decide on the merits of various project options, the pre feasibility study should discuss briefly the following:

- The structure and objective of the project
- The nature and size of the demand for the output or the needs that it would satisfy, together with the foreseen beneficiary groups.
- The availability of the most important materials and human inputs
- Approximate investment and operation costs as well as expected revenues and other benefits.
- Rough estimates of financial and economic returns.
- Any major factor that is likely to have an important effect on the project, and
- What further information on the technical, institutional, financial, economic and social aspects of the project should be acquired through special studies and survey?

At the project identification or the preparation stage, we need to know, first of all, what the objectives of the project are. Projects are essentially vehicles for removing constraints and providing incentives and other means for achieving higher productivity and/or improving welfare.

So, what are the targets we want to reach and what are the obstacles in the way of achieving these targets? Targets or goals have to be as specific as possible. Being more specific involves such things as:

- Identifying the target group of beneficiaries and stating what their present incomes are and what the target level of income is to which it is expected that the project will more the target beneficiaries;
- Specifying any improvement in social services necessary to bring the target group up to national standards in terms of basic needs and the quantity and quality of the services provided, etc.

Thus, the difference between **pre-feasibility and feasibility analysis** and **project identification brief and project document** is one of degree rather than kind.

4.2. FEASIBILITY STUDY FOR PUBLIC PROJECTS

Public projects are those that are primarily identified for benefiting the general public, not for profit, and carried out by the government, NGOs, and charitable individuals. The major theme of public projects feasibility study includes whether the projects are socially desirable, improve the wellbeing of the general public, enhance the national economic development (such as linkage among economic sectors), harness abundant resources (such as labor intensive for developing countries), boost environmental sustainability, affordability. In broad terms, there are five important aspects of project feasibility studies for a public sector. These are (Cusworth and Tom, 1993; Cuury and Weiss, 1993; DEPSA, 1990; Gittenger, 1998; Little and Mirrlees, 1974):

- Technical feasibility
- Institutional feasibility
- Financial feasibility
- Economic feasibility
- Social feasibility

Activity 4.1: Discuss in brief on the differences and similarities of public and private sector development project's feasibility study.

4.2.1. TECHNICAL FEASIBILITY

What is technically the best solution may not necessarily be the least costly solution, and what is technically the least costly solution may not necessarily be the most profitable. This is because different technical options may result in different benefits, and it is only by comparing the costs and benefits of alternative technical ways of achieving project goals that we can say which is the best.

The following are some of the general technical aspects one needs to be aware of. For example, if the project is an agricultural project, has the package, e.g. a mix of improved seeds and cultural practices, been well researched and field-tested? Does it take account of other farm and off farm activities? What are the costs and benefits of alternative packages?

- **Technology Package:** Is the machinery or equipment appropriate to the receiving situation?
- **Location:** What is the optimum area to be covered by the project in terms of resources, Management, etc?
- **Scale of Operations:** Are there significant economies of large-scale production or provision of services? At what point do diseconomies set in?
- **Land Use:** Does the physical/spatial layout of settlement schemes pay adequate attention to land use-planning considerations? E.g., the location of project offices, warehouses, schools, clinics, etc?
- **Recurrent Cost:** Has adequate provision been made for recurrent costs of operating the project, including maintenance?
- **Environmental Considerations:** If virgin forest or jungle is to be cut down and planted up with long-gestation tree crops has provision been made for adequate terracing, bunding, and providing ground cover until the tree crops have canopied? If a dam is to be built, what are the environmental effects of up stream and down stream of the dam? If insecticides, etc, are to be used in large quantities in irrigation projects, what will be the effect on fish farming? Etc.

Activity 4.2: By taking any one of the public development projects, which is undergoing in your environment, analyse in brief its technical feasibility.

4.2.2. INSTITUTIONAL FEASIBILITY

The most serious constraints with planning and implementing projects is the various kinds of institutional problems. Many of these constraints stem from basic public sector organization, procedures, civil service promotion criteria and pay scales, etc.

Although many institutional constraints can be tackled only at the national level, nevertheless much can be done through good project design to ensure, as far as it is possible to do so, those proposals are institutionally feasible. Here are some of the salient factors:

- Identification of those things which can be controlled and those which can only be influenced
- Sound internal organizational structure of the project,
- Competent management and supervisory personnel,
- Adequate technical and skilled personnel;
- Provision of any necessary training facilities;
- Effective channels of communication and good relationships with contributory agencies, e.g. national research organizations;
- Realistic implementation schedules, has network analysis (Critical Path Method (CPM), program, evaluation, review technique (PERT) or other similar methods) been used,
- If policy changes are necessary for the full success of the project, whether and when they are likely to be made, e.g. Water charges in irrigation projects.

Activity 4.3: By taking any one of the public development projects, which is undergoing in your environment, analyse in brief its institutional feasibility.

4.2.3. FINANCIAL FEASIBILITY

Financial feasibility is relevant only for projects where goods or services are being charged for, albeit subsidized in one form or another. It is clearly not relevant for social service projects, for example, in which the social services are considered to be "**public goods**" and provided "**free**" with the costs being met from general revenues.

For all other projects, there are four ways to look at financial feasibility:

- From the point of view of the direct project beneficiaries,
- From the point of view of the project as a whole,
- From the point of view of any financial intermediary there may be, and
- From the point of view of the government

Under the financial analysis, resources are valued at their market prices.

4.2.4. ECONOMIC FEASIBILITY

Economic feasibility looks at the net benefits from projects from the point of view of the nation as a whole in terms of the efficient use of scarce resources. All resources are relatively scarce, some scarcer than others, and almost all resources can be used in alternative ways. So the question is "**does this project make the most efficient use of the resources to be employed?**"

Under economic analysis, resources are valued in terms of their opportunity costs. These opportunity costs are valued in terms of a common unit of account, or yardstick or numeraire; called variously as shadow prices, economic efficiency prices, economic accounting price or simply accounting prices.

A number of numeraires have been suggested. The two commonly used are the Little-Mirrless and UNIDO methodologies. Little-Mirrless values all costs and benefits in terms of opportunity costs expressed in **border prices** or **border price equivalents**, while UNIDO values them in terms of opportunity costs expressed in domestic prices.

- **Border prices are foreign prices converted into domestic currency units by applying the official exchange rate.**

Activity 4.4: By taking any one of the public development projects, which is undergoing in your environment, analyse in brief its economic feasibility.

4.2.5. SOCIAL FEASIBILITY

Both financial and economic analysis assumes that a Dollar or a Birr or both has the same social value for a poor as a rich person. They also assume that a Dollar or Birr used for private consumption has the same value as a Dollar or Birr saved and as a Dollar or Birr in the hands of the Government. However, social cost benefit analysis based on making value judgment assume that a Birr in the hands of a poor person has greater social value than a Birr in the hands of a rich person.

Activity 4.5: By taking any one public development project, which is undergoing in your environment, analyse in brief its social feasibility.

Activity 4.6: Assume that your municipality is identifying a project idea that caters to the existing potable water supply problem called “**pure water for all**”. Therefore, based on your session on feasibility study for public sector, analyze the project idea from technical, institutional, financial, economic, and social point of view.

4.3. FEASIBILITY STUDY FOR COMMERCIAL PROJECTS

Commercial projects are those that are primarily conceived for generating maximum profit through customer satisfaction. Once the pre feasibility study indicates that the project is, prima facie, promising and further work is justified, the project enters the stage of preparation (feasibility study). Feasibility study provides relevant information for the final investment decision (accept or reject) based on a thorough and comprehensive analysis of the projects technical, financial, economic, social and institutional aspects.

Commercial project feasibility study includes (Chandra, 2006; Choudhury, 1988; ICMR, 2007; Joy, 1994; Kotler, 2000; Meredith and Mantel, 2006; UNIDO, 1991):

1. Market and Demand analysis
2. Raw materials and supplies study
3. Location, site, and environmental assessment
4. Production program and plant capacity
5. Technology and engineering study
6. Organization and Management
7. Project charts and layouts
8. Structures and Civil works
9. Financial Analysis
10. Economic Analysis
11. Environmental Analysis
12. Gender Analysis
13. Implementation (Work) scheduling

The above project feasibility study dimensions for commercial projects are discussed below in precision.

4.3.1. MARKET AND DEMAND ANALYSIS

Market Analysis and Market Concept

The objective of an investment project is benefit from utilization of resources and satisfying the market demand in a society. This market analysis is an important key in determining the magnitude of investment, location, technology requirement, production program, etc. The market analysis (the concept of marketing) is the orientation of management with regard to their business decisions that is market makes all participants in an organization to orient their thinking towards the market. The concept incorporates number of things such as marketing system, marketing tools, etc, but the most important of all is **market** involves interaction between consumer and producer, and **marketing** involves the study of the interactions (relationships) between the two parties and the interaction is what we call it market system.

The major objective of market analysis is to determine whether there is a gap between demand and supply, i.e., is there a market for the product?

Period	Output of a product ('000)		
	Demand	Supply	Gap
1990	200	150	50
1991	250	200	50
1992	270	210	60
1993	300	250	50
1994	400	250	150
1995	500	300	200
1996	600	340	260
1997	700	400	300
«»»»»»	«»»»»»	«»»»»»	«»»»»»
«»»»»»	»»»»»»	«»»»»»	«»»»»»
2006	1200	950	250

Market Analysis

A. Marketing

It is the interaction between producers and consumers. The four marketing instruments for which a market analyst should take account of usually called the market-mixes (or the four P's) are:

1. Product

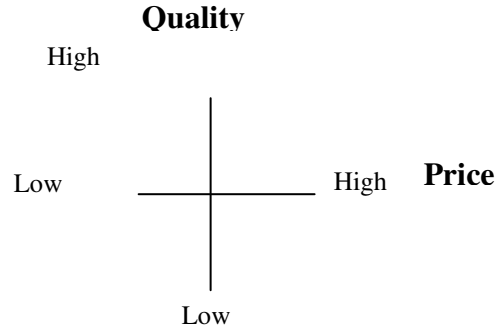
- Product mix
- Quality
- Design
- Packaging
- Service

2. Promotion

- Advertising
- Public relations
- Personal sale
- Sales promotion
- Brand policy

3. Price

- Positioning of quality and price



- Rebates (discount) and terms of sale
- Financing Conditions

4. Place

- Channels of distribution
- Distribution density
- Lead time and stock
- Transport

B. Market Research

Market research is the systematic assessment of information on market. It requires an effective marketing system, data assessment and data assessment organization.

1) Marketing System

What is the interaction between market participants, such as the relationship between the enterprise and competitors, enterprise and customer, enterprise and agents, etc?

2) Data Assessment

The two main ways of market data assessment are desk research (already existing information) and field research (Interview, tests, observations). Sometimes these two ways of getting information may overlap (i.e., applied simultaneously). There can be general and specific market data.

- General market data, such as:
 - General economic conditions (GNP, population, income level, etc)
 - Government policies (consumption, production, restrictions, taxes, incentives, etc)
 - Import and export
 - Import and export substitution
 - Consumer behavior
- Specific market data, such as demand and supply of the specific product of the project.

3) Data Assessment Organization

Assessment of targeted market and structure of the targeted market:

For example, if you study cement industry, your target market is construction area. Determining the targeted market is not enough. The market analyst should assess the market structure; degree of competitive behavior of a firm and competitive behavior of a firm's environment; custom of a society: What outlook does the society have for the product? And pattern of employment: What is the pattern of employment? Is it subsistence agriculture? We have to study the income group of the market. Obviously you cannot set up a can manufacturing plant in a country where 85% of the population is on subsistence income level.

In general, market structure refers to the competitor structure, customer structure, custom and employment, means of competition (the 4 P's), structure of distribution (channels of distribution), etc.

Customer Analysis and Market Segmentation, it involves

- Analysis of what, why, how, when, how much, and where customer purchase a product.
- Market structure of the product (Consumer goods or capital goods market)
- Market segmentation (i.e. Uniform customer behavior such as children and adult market; organizational and Individual market, etc)
- Market Analysis (market volume, market potential, market share, sales, production program inputs, etc)
- Export market so as to meet international standards
- Imports

C. Analysis of the Channels of Distribution

Identify the various possible chains connecting producers and end users. These are often:

- Whole sellers distribution
- Retailers distribution
- Direct to customers

D. Analysis of Competitors

- Assess how competitors use market-mix (i.e., the 4 P's).
- General information about competition (sales, market share, etc)

For example,

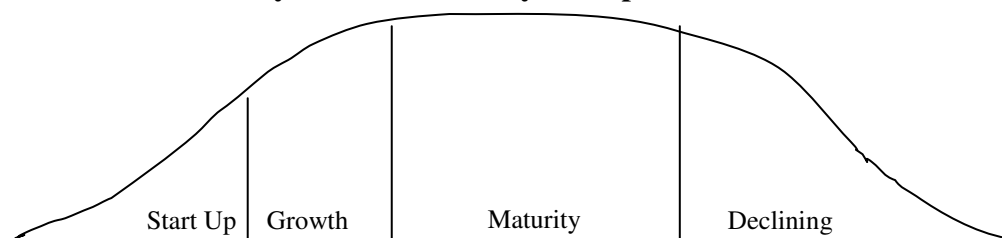
	<u>Market Share</u>
Shell -----	40%
Agip -----	10%
Total -----	20%
Mobil -----	30%

This helps as a profile of reaction and main strength and weakness of competitors to compare with own situation.

E. Analysis of the Socio-Economic Environment

Analysis of the socio-economic environment commonly focuses on two things:

(i) Phase of the life cycle of the industry anticipated to enter



Life Cycle of the Product

- **Start Up-** the industry is infant; people do not know its existence and its usefulness.
- **Growth Period-** people know the industry and its use.
- **Maturity-** the industry becomes a common practice or activity and then the market will be filled with the product.
- **Declining (Shrinkage) -** the product lacks market step by step.

(ii) **Wider socio-economic environment**

- Society and culture
- Social and economic policies
- Customs and habits
- Ecology and environmental protection plans
- Inflation and Demography
- Politics and Laws
- Development of domestic and international trade, etc.

F. Marketing Strategy

Marketing strategy involves in:

- Geographical area strategy - Where shall I have my project?
- Channel of distribution strategy - Shall I use Wholesale, Retail sale, Agent, etc?
- Market share and Price strategy:
 - Cost Leadership
 - Differentiation
 - Marketing Targeting
 - 4 P's (Product, Place, Promotion, and Price)
- Product market relations strategy:
 - Market Penetration
 - Market development
 - Diversification
- Competition and Market Expansion, etc.

G. Marketing Cost

The marketing cost arises from the marketing strategy, such as packaging, storage, salaries, commission, discounts, promotion and advertisement, transport, insurance, distribution, supplies, market research, etc.

H. Demand Projection

In feasibility study current demand is determined and the future potential demand will be forecasted with the help of different techniques. These techniques of demand projection are:

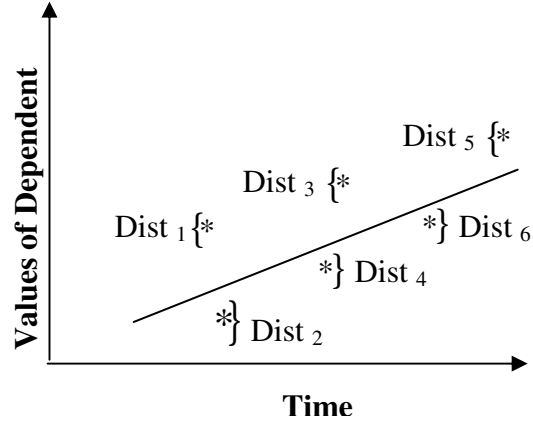
- Trend Analysis
- Average Annual Rate of Growth Method
- Regression Analysis
- Consumption Coefficient

Trend Analysis

Trend analysis assumes that demand is dependent on time, i.e. demand is a function of time: $D=f(t)$, where time is an independent variable.

Let us consider the case of Mid Western Manufacturing Company. The firm's demand for electrical generators over the period 1981-1987 is shown below:

Year	Electrical Generators Sold
1981	74
1982	79
1983	80
1984	90
1985	105
1986	142
1987	122



To develop a linear trend line by a precise statistical method, the least squares method may be applied. This approach results in a straight line that minimizes the sum of the squares of the vertical differences from the line to each of the actual observations.

A least squares line is described in terms of its y-intercept (the height at which it intercepts the y-axis) and its slope (the angle of the line). If we can compute the y-intercept and slope, the line can be expressed by the following equation:

$$y = a + bx, \text{ where}$$

y = Computed value of the variable to be predicted (Dependent variable)
 a = y - axis intercept
 b = Slope (the rate of change in y for given changes in x)
 x = Independent variable

$$a = \bar{y} - b\bar{x} \quad \text{and} \quad b = \frac{\sum xy - n\bar{x}\bar{y}}{\sum x^2 - n\bar{x}^2}$$

With a series of data overtime, the computations can be reduced if the values of the X-variable (time) are transformed to simpler numbers that sum to zero.

Year	Time Period (X)	Generator Sales (Y)	X ²	XY
1981	-3	74	9	-222
1982	-2	79	4	-158
1983	-1	80	1	-80
1984	0	90	0	0
1985	1	105	1	105
1986	2	142	4	284
1987	3	122	9	366
	$\sum X = 0; X = \sum X/n = 0$	$\sum Y = 692; Y = \sum Y/n = 98.86$	$\sum X^2 = 28$	$\sum XY = 295$

Then, the computations are as follows:

$$b = \frac{\sum XY - n\bar{X}\bar{Y}}{\sum X^2 - n\bar{X}^2}$$

$$b = \frac{295 - 7(0)(98.86)}{28 - 7(0)}$$

$$b = \frac{295}{28}$$

$$b = 10.54$$

$$a = \bar{y} - b\bar{x}$$

$$a = 98.86 - 10.54(0)$$

$$a = 98.86$$

Hence, the least squares equation is $Y = 98.86 + 10.54X$.

To project sales in 1988, we first denote the year 1988 in the new coding system as $X = 4$.

$$Y \text{ (Sales in 1988)} = 98.86 + 10.54(4)$$

$$= 141.02 \text{ or } 141 \text{ Generators.}$$

Sales for 1989 are estimated by inserting X= 5 in the same equation.

$$Y = 98.86 + 10.54(5) \\ = 151.56 \text{ or } 152 \text{ Generators.}$$

Therefore, following is the next five years (1988 -1992) projection:

Year	Coded Time Period (X)	Generators (Y) [Y = 98.86 + 10.54x]
1988	4	141.02
1989	5	151.56
1990	6	162.10
1991	7	172.64
1992	8	183.18

Average Annual Rate of Growth Method

Follow the following steps to compute average annual rate of growth:

Step 1: Compute index of demand movement (I),

$$I = \frac{Y_i}{Y_{i-1}}, \text{ Where, } I = \text{Index} \\ Y_i = \text{Demand in year } i \\ Y_{i-1} = \text{Demand in year } i-1$$

Step 2: Compute logarithm of each index (i.e. log I),

Step 3: Compute average of the logarithm index,

$$V = \frac{\sum \log I}{n}, \text{ where } n = \text{number of years}$$

Step 4: Compute antilog of the average logarithm index,

$$G = \text{Antilog } V$$

Step 5: Compute the average growth rate, and

$$\text{Growth Rate (Gr)} = G-1$$

Step 6: Project using:

$$Y_i = Y_{i-1} + (Y_{i-1} \times \text{Gr})$$

Year	Generator Sales	(1) Index: $\frac{Y_i}{Y_{i-1}}$	(2) Log I
1981	74	-	-
1982	79	1.0676	0.02841
1983	80	1.0127	0.00548
1984	90	1.1250	0.05115
1985	105	1.6667	0.06696
1986	142	1.3524	0.13111
1987	122	0.8592	-0.06591
			$\sum \log I = 0.2172$

- $V = \frac{\sum \log I}{n} = \frac{0.2172}{7} = 0.03103$
- $G = \text{Antilog } V \Rightarrow \text{Antilog } 0.03103 = 1.074$
- $\text{Gr} = G - 1 \Rightarrow 1.074 - 1 \Rightarrow 0.074$ or Average Annual Rate of Growth = 7.4%

Thus, following is the five years (1988-1992) projection.

$$Y_i = Y_{i-1} + (Y_{i-1} \times \text{Gr}) \text{ or } Y_i = Y_{i-1} (G)$$

Year	$Y_i = Y_{i-1} (G)$
1988	131.028
1989	140.724
1990	151.138
1991	162.322
1992	174.334

Regression Analysis

Regression analysis is a causal forecasting model, which usually considers several variables that are related to the variable being predicted. Once the related variables have been found, a statistical model is built and used to forecast the variable of interest. Regression analysis uses the least squares approach on one or more independent variables to develop a forecasting model.

Assume that Triple A Construction Company renovates old homes. Overtime, the company has found that their dollar volume of renovation work is dependent on the Albany area payroll. The figures for Triple A's revenues and the amount of money earned by wage earners in Albany for the years 1982-87 are presented below.

Year	Y [Triple A's Sales], (100,000's)	X [Local Payroll] (100,000,000's)
1982	2.0	1
1983	3.0	3
1984	2.5	4
1985	2.0	2
1986	2.0	1
1987	3.5	7

Now, Triple A wants to establish a mathematical relationship that will help predict sales. Least squares regression analysis may be used to establish the statistical model. The same basic model applies: $\hat{Y} = a + bx$ and the calculations for a and b follow:

Sales (Y)	Payroll (X)	X ²	XY	Y ²
2.0	1	1	2.0	4.0
3.0	3	9	9.0	9.0
2.5	4	16	10.0	6.25
2.0	2	4	4.0	4.0
2.0	1	1	2.0	4.0
3.5	7	49	24.5	12.25
$\Sigma Y = 15.0$	$\Sigma X = 18$	$\Sigma X^2 = 80$	$\Sigma XY = 51.5$	$\Sigma Y^2 = 39.5$

$$\bar{x} = \frac{\Sigma x}{n} \Rightarrow 18/6 \Rightarrow 3$$

$$\bar{y} = \frac{\Sigma y}{n} \Rightarrow 15/6 \Rightarrow 2.5$$

$$b = \frac{\Sigma xy - n\bar{x}\bar{y}}{\Sigma x^2 - n\bar{x}^2} \Rightarrow \frac{51.5 - (6)(3)(2.5)}{80 - 6(3^2)} \Rightarrow \frac{51.5 - 45}{26} \Rightarrow \frac{6.5}{26} \Rightarrow \underline{0.25}$$

$$a = \bar{y} - b\bar{x} \Rightarrow 2.5 - 0.25(3) \Rightarrow \underline{1.75}$$

Therefore, the estimated regression equation is:

$$Y = 1.75 + 0.25X; \text{ i.e., Sales} = 1.75 + 0.25 (\text{Payroll})$$

Lastly, we have to measure how strong the linear relationship is between the two variables, which are the sales and payroll, by using the correlation coefficients for Regression Lines (r):

$$r = \frac{n\Sigma xy - \Sigma x\Sigma y}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2]}}$$

Four values of the correlation coefficient:

- a) Perfect positive correlation when $r = 1$
- b) Perfect negative correlation when $r = -1$
- c) Positive correlation when $0 < r < 1$
- d) No correlation when $r = 0$

Then the correlation coefficient for Triple A Construction Company is:

$$\begin{aligned}
 r &= \frac{n\sum xy - \sum x \sum y}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}} \\
 &= \frac{(51.5) - (15 \times 18)}{\sqrt{[6(80) - (18)^2][6(39.5) - (15)^2]}} \\
 &= \frac{309 - 270}{\sqrt{(408 - 324)(237 - 225)}} \\
 &= \frac{39}{\sqrt{(156 * 12)}} \\
 &= \frac{39}{\sqrt{1872}} \\
 &= \frac{39}{43.27} \Rightarrow r = 0.901,
 \end{aligned}$$

This r-value appears to be a significant correlation and helps to confirm the closeness of the relationship of the two variables.

Thus, following is the five years (1988-1992) sales projection:

Year	Payroll (P), where $P = 3 + 0.63t$ (Forecasted using Trend Analysis); (100,000,000's)	Sales (Y), where $Y = 1.75 + 0.25P$; Where P = Payroll; (100,000's)
1988	5	3
1989	6	3.25
1990	7	3.5
1991	7	3.5
1992	8	3.75

Consumption Coefficient

Consumption coefficient technique is useful for projects that will produce intermediate goods to forecast their demand. For example, the consumption of tyre depends upon the number of cars produced and the consumption of petroleum is also dependent upon the cars produced, etc.

Consider the demand for petroleum that is to be derived from the volume of vehicles produced (or sold):

Demand for Petroleum

Vehicles	Annual consumption per vehicle
Private	1,000 Lt.
Taxis	7,000 Lt.
Commercial	9,000 Lt.
Government	3,000 Lt.
Others	1,000 Lt.

Forecasted number of cars

	1990	1991	1992	1993	1994	1995	1996
Private	30	40	40	50	50	60	70
Taxis	6	7	8	9	10	11	12
Commercial	20	30	30	40	40	40	50
Government	10	10	20	20	20	30	40
Others	10	10	20	20	30	30	40

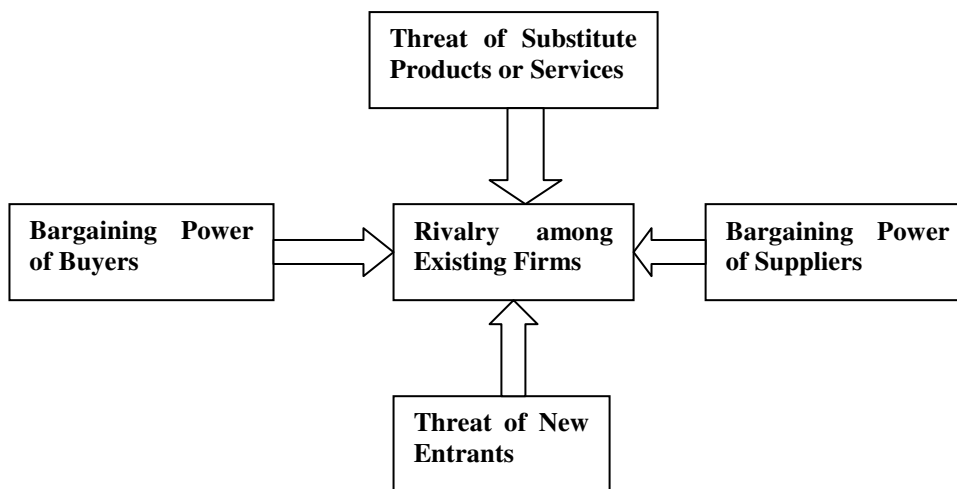
Total Forecasted Annual Consumption of Petroleum:

**No of x Annual
Cars Consumption**

	Years						
	1990	1991	1992	1993	1994	1995	1996
Private	30,000	40,000	40,000	50,000	50,000	60,000	70,000
Taxis	42,000	49,000	56,000	63,000	70,000	77,000	84,000
Commercial	180,000	270,000	270,000	360,000	360,000	360,000	450,000
Government	30,000	30,000	60,000	60,000	60,000	90,000	120,000
Others	10,000	10,000	20,000	20,000	30,000	30,000	40,000
Total	292,000	399,000	446,000	553,000	570,000	617,000	764,000

Moreover, the market analyst may consider 1) the **Michael Porter’s Model** in order to assess and analyse the project’s industry attractiveness (i.e., the bargaining power of suppliers, bargaining power of customers, entry barrier, threat from close substitutes, and the industry rivalry (whether there is healthy or unhealthy competition),

Figure 4.1: Porter’s Industry Attractiveness/Competitiveness (Porter, 1979):



and 2) the BCG Matrix in order to analyze the position of the industry’s product (i.e., whether its product is in a state of dog, question mark, cash cow, or star).

Figure 4.2: Boston Consultancy Group (BCG) Matrix (Mead Corporation, 1977)

Market Growth	High	Question Mark	Star
	Low	Dog	Cash Cow
		Low	High
		Market Share	

Decision:

After the market and demand analysis, the analyst should opine on the feasibility of the project based on the signal of the market and demand study. Is there a demand for the output of the project in the market? What is the demand and supply gap? Etc.

Activity 4.7: Assume that W/o Eshet intends to construct a “Soap Factory” in your environment. She is requesting your unreserved project expertise. Therefore, make a brief market analysis and give her your expert opinion.

4.3.2. RAW MATERIALS AND SUPPLIES STUDY

There is technical relationship between input and output; the amount of input determines the output amount. Conversely, you have determined the product type and capacity. The next step to produce as per the above step is what input to use.

The raw materials and supplies study consists of thorough analysis on what type of input? Where to find? How much it costs? Etc. Thus, the following approaches are often used to study raw materials and supplies.

A. Classification of Raw Materials and Supplies

1. Raw Materials (Un processed and Semi-processed):
 - Agricultural product
 - Livestock and Forest products
 - Marine products and Fishery
 - Mining
 - Quarrying, Etc.
2. Processed and Industrial Materials and Components
3. Factory Supplies:
 - Electricity, Fuel, Water, etc
 - Recycled waste
4. Spare parts
5. Supplies for Social and external needs, etc.

Categories of Project Supplies:

1. **Factory Supplies:** This can be categorized into three:
 - i. Auxiliary Materials: Such as chemicals, packaging materials, paints, etc.
 - ii. Utilities: Such as energy, fuel, water, etc.
 - iii. Other supplies such as compressed air.
2. **Spare Parts:** This can be categorized into two as longer and shorter lifetime.
3. **Social Supplies and External Needs:** This is characterized mainly for projects that are located in rural areas; roads, medical services, and other infrastructure facilities should be identified.

Factors affecting project input requirements:

1. Socio-Economic Factors

This refers to the social and cultural background of the society where the project is planned to be located. For example, meat factory should not be opened where meat is not eaten.

2. Commercial and Financial (Business) Factors

The Project input requirement depends on the type of raw materials used, productivity of workers, market demands for a given product, product mix, availability of fund, etc.

3. Technical Factors

The project input requirement depends on the type of the industry, technology and production process, machinery and equipment, project life, etc.

B. Specification Requirement

This involves in,

1. Measurement and specification of the required raw materials and supplies, such as heat, moisture, weight, size, colour, etc.
2. Identifying project characteristics.

C. Availability and Supply

This involves in deep study about the availability and supply of the raw materials and supplies. It can be available from local and/or foreign suppliers.

1. Local Category

- Source - Where to find?
- Transport - What means of transport to use?
- Quantity - How reliable is the availability?
- Certainty / Uncertainty

2. Import Category

- Source
- Transport
- Quantity
- Certainty / Uncertainty

3. Input alternatives: It involves in searching for input substitution other than the main raw material and supply.

- Source
- Transport
- Quantity
- Certainty / Uncertainty

D. Supply Marketing and Supply Program Strategy

1. Supply Marketing

- Cost minimization strategy
- Risk minimization strategy
- Supplier relations:
 - Do we have to stick to only one supplier or more?
 - What is the supplier's profile?
 - What is the bargaining power of each supplier? Etc.

2. Supply Programming

- Volume of raw materials and supplies
- Agreements and regulations
- Storage, etc.

E. Cost of Raw Materials and Supplies

It involves in determining:

- The total cost:
 - Raw material supplies cost
 - Overhead cost
- Unit cost

Decision:

After the raw materials and supplies study, the analyst should decide on the abundance of the supply of raw materials and supplies.

Activity 4.8: Assume that W/t Senbetu wants to construct a “Hole Bricks Factory” in your environment. She is requesting your unreserved project expertise. Thus, you are required to make a brief raw materials and supplies analysis and give her your expert opinion.

4.3.3. LOCATION, SITE, AND ENVIRONMENT

The location of the project is highly affected by the nature of the project itself. Projects can be categorized under three forms of locations.

1. **Rooted Projects** are projects rooted at certain area (proximity to an input) because it is better to transport end products (outputs) than raw materials for the cost involved in transporting raw materials is greater than the cost incurred to transport end products. For example, Cement industry should be located where limestone is located).
2. **Tied Projects** are projects that are tied to the market (proximity to the market) because the transportation of the final product is uneconomical. For example, Beverage industry, Ceramic projects, etc should be located near to the market.
3. **Foot Loose Projects** are projects that can be located anywhere. They are neither tied to the market nor rooted to the raw materials. For example, candy industry.

The site, location, and environmental studies comprise the following:

A. Location Analysis (Location Selection)

Location studies must be carried out over wider geographical area. The strategic orientation of choice of location includes:

1. Proximity to market and raw materials

For example, gold mining and cement factory are usually projected at the raw material site.

2. Natural Environment Assessment

- Climate conditions (temperatures, rainfall, hurricane, dust, wind, etc).
- Effect on agriculture, industry, transport, construction, management, etc.
- Ecological requirement, such as avoiding contaminating water smoke.

3. Environmental Impact Assessment

It aims at ensuring the development projects are environmentally sound. Thus, it involves in:

- Assessment of environmental consequences of the newly planned or existing project and of any related activities. The assessment is based on legal regulations and emission standards and guidelines established in the country (region) of plant location.
- Assessment of environmental conflicts that is potential conflicts with existing and future neighboring industries, urban settlements should be critically assessed for its consequences are closedown, compensation, purification, etc.

Phases and Structure of Environmental Impact Assessment

- Preliminary environmental impact assessment:
 - Use checklist to check which impact need to be analyzed.
- Detailed analysis, site visit (in depth study)
- Preparation of environmental impact statements

4. Socio - Economic Policies: It involves in the study of,

- Government regulations and restrictions
- Local government policies: that is concessions, incentives, restrictions, fiscal and legal regulations, procedures, utility supplies, building regulations, taxes, etc.

5. Infrastructure Conditions: It studies,

- Technical infrastructure
- Transport and communication
- Social infrastructure (Police, Court, etc)
- Factory supplies (electricity, water, fuel, etc)
- Availability of human resources
- Infrastructure services (construction, erection, garages, etc)

6. Effluent and Waste Disposal: It studies,

- Gaseous effluent such as smoke
- Noise, heat, vibration
- Liquid or solid effluent

Decision: In line with the location analysis criteria, select the location that best fits among alternatives.

B. Site Selection

During site selection, the following requirements and conditions should be assessed:

- Site requirements such as ground condition, soil condition, site preparation and development, etc.
- Construction requirement such as requirements by the municipality.
- Land conditions that are infrastructure, such as an out let to the main road.
- Effluent and waste disposal
- Human resources
- Social infrastructures such as school, hospital, market, police, court, etc.
- Socio - economic condition that is society may resist certain areas not to be used for project location.
- Strategic aspects: Project site analysis should give certain allowance for project expansion.
- Cost of land: Land can be acquired through purchase, lease or concession, which depends on the law of the land. The analyst should select land with optimal cost.

Decision: Based on the site selection requirements, select the site, which best fits.

C. Cost Estimates

The major costs with regard to location and site selections are:

- Cost of mitigating the environmental problems, that is cost of devices to mitigate
- Cost of land
- Transport such as cost of transporting output and raw materials to the market and the plant respectively, items for construction purpose.
- Others such as housing costs and benefit packages for employees, etc.

Activity 4.9: W/o Eshet's Soap Factory above is planning to make a brief location and site analysis. Thus, you are requested to give her your expert opinion.

4.3.4. PRODUCTION PROGRAM AND PLANT CAPACITY

The scope of an investment is defined by corporate or project objectives and strategies determined by the potential investors taking in to account the overall business environment and marketing concepts as well as the available project inputs or resources.

It is the task of engineering to design the function and physical lay out for the industrial plant necessary to produce the defined output, determine the corresponding expenditure (investment and operational costs) to be achieved under the technical, political, social and environmental constraints.

The production program and plant capacity study involves in:

A. Determination of Production Program

Production program implies how you intend to produce the selected product. There are often four factors to determine production program:

1. Market requirement and marketing concept that is the range and volume of products to be produced depends primarily on the market requirements and the proposed marketing strategies, i.e., sales program.
2. Input requirement that is the need and availabilities of raw materials and supplies.
3. Technology that is the technology and know how to be utilized in the project.
4. Time frame that is the net working days per year, number of working hours per day, number of shifts and the capacity build up.

B. Determination of Plant Capacity

Plant capacity implies the volume of out put that can be produced during a given period of time. There are two levels of plant capacity:

1. Feasible (Normal) Capacity

It is the achievable under normal working conditions taking in to account normal stock, down time, holidays, maintenance, tool changes, management system apply, etc, which is taking in to account all real world problems and constraints.

2. Maximum (Nominal or Designed) Capacity

Designed capacity assumes technically feasible condition with out taking in to consideration any real world problems and constraints like machine break down.

Factors that influence the capacity of a plant

- Economies of scale
- Minimum economic size and equipment constraint (hard ware technology)
- Resource and Input constraint
- Performance of staff and labour (soft ware technology, i.e., the skill, etc)

4.3.5. TECHNOLOGY AND ENGINEERING STUDY

Technology and engineering study covers:

- A. Production program and plant capacity
- B. Technology choice
- C. Technology acquisition and transfer
- D. Plant lay out and basic engineering
- E. Machinery and equipment selection
- F. Civil engineering works
- G. Maintenance and Replacement Requirement
- H. Estimate of investment costs.

A. Production Program and Plant Capacity

The production program and plant capacity study was briefly discussed in **section 4.4.4** of this chapter. To remind you, the following factors should be considered in determining production program:

- Market requirement and marker concept
- Input requirement
- Technology (software and hardware)
- Plant capacity:
 - Feasible normal capacity
 - Nominal (maximum or design) capacity

B. Technology Choice

Technology selection should be based on a detailed consideration and evaluation of technological alternatives (e.g., Japan, German, America, etc) and the selection of the most suitable alternative in relation to the project or investment strategy chosen and to socio-economic and ecological conditions, which is the appropriate technology which uses the abundant supply factor input in the country. For example, in labour abundant country, appropriate technology is the technology that is labour intensive.

Factors and Functions Considered in Technology Selection

1. Ecological and environmental impact (possible hazards due to the technology)
2. Ecological orientation of the preliminary lay out
3. Assessment of technology required:

Steps:

- i) Problem definition
- ii) Technology description and project lay out:
 - Functions layout
 - Characteristics of technology
 - Materials flow diagram
 - Utility line, i.e., electricity, etc
 - Extension and expansion
 - Etc
- iii) Technology market and alternatives (sources of technologies, alternatives and their cost):
 - Assessment of availability
 - Technology forecast (i.e., obsolescence)
 - Socio-economic impact
 - Environment impact, Etc.

C. Technology Acquisition and Transfer

How to acquire those technologies? The analyst should consider the following factors:

1. Industrial property right (patent and franchise)
2. Means of technology acquisition:
 - Licensing
 - Purchase of technology
 - Participation of the license holder in joint venture
3. Contract terms and conditions (warrants and guarantees)
4. Cost of technology

D. Plant Lay-Out and Basic Engineering

Plant layout and basic engineering study requires:

1. Detailed plant lay out
2. Basic engineering
3. Detailed charts and drawings:
 - Functional layout (principal structure and buildings, major equipment, roads, utility etc)
 - Location of main production units (such as loading areas, out lets)
 - Material flow diagrams
 - Production line diagrams (stages of production)

E. Machinery and Equipment Selection

The selection of technology and equipment are interdependent. The requirements of machinery and equipment should be identified in the feasibility study on the basis of plant capacity and the selected production technology. The selection of machinery and equipment should take in to account:

- Relationship with other study components (market, technology, plant capacity, etc)
- Level of automation (labour or capital intensive)
- Categories of equipment and cost:
 - Production equipments
 - Auxiliary equipments (not directly used in the production process such as laboratory and workshop)
 - Import/export, etc.
- Limitations and constraints (such as electricity, manpower, etc)
- Tenders and bids

F. Civil Engineering Works

The feasibility study should provide plans and estimates for the civil works related to the project. It considers:

- Site preparation and development
- Factory and other buildings
- Civil engineering works relating to utilities
- Transport (inside and outlet)
- Commission and effluent discharge
- Fencing and security
- Other facilities and requirements of the plant

G. Maintenance and Replacement Requirement

Maintenance and replacement requirement is basically related to the building and machineries and equipments. It covers:

- Establish ages (life span of each of the building, machinery and equipment)
- Major overhaul schedule of building, machinery and equipment.
- Preventive maintenance
- Spare parts

How to maintain? There are two ways:

1. **Own workshop:** Own workshop maintenance requires acquisition of tools, equipment, trained manpower, etc for maintenance.
2. **Outside workshop services:** But, are they knowledgeable enough? Etc.

H. Estimate of Investment Cost

Investments are categorized as working capital and fixed capital. Here we are talking about fixed investments that can be identified by the technology and engineering study. Usually fixed investment comprises:

- Cost of machinery and equipment (cost of machinery and equipment, cost of auxiliaries, cost of devices, transport, insurance, installation, etc).
- Cost of building mostly determined by using bill of quantity (list of all materials needed or required to build a building) or standard measures that is

Cost/m².

During project preparation, there are a number of techniques to estimate investment costs. These are:

1. Rule of Thumb Method

It is based on experience. There should be certain statistical readings to determine the components. Basically, machinery and equipments are said to be 50% of the investment costs or main plant is said to be 30% of the total costs. This is lazy man exercise method.

Problems:

- Percentage can vary from project to project.
- For certain projects, civil work requirement may be low or vice versa.

This method is recommended only if there is no information on prices of machineries, equipments, etc.

2. Exponential Method

This method uses mathematical formula depending on the availability of historical data or cost of similar projects. The rationale is that if the size of two projects and capacity (cost) of one project is known, it is possible to estimate the cost of the second project:

$$S_1/S_2 = (C_1/C_2)^n$$

Where, S_1 =capacity of a project whose investment cost is known.

S_2 =capacity of a project whose investment cost is not known.

C_1 =investment cost of project S_1

C_2 =investment cost of project S_2

N = the exponent factor that vary between 0.6 - 0.7

Note: The exponential factor (n) is published by various commercial institutions. For example, assume two project P_A and P_B .

$SP_A=300,000$ tons capacity per year and $CP_A=240$ million Birr

$SP_B=600,000$ tons capacity per year and $CP_B=?$

$S_1/S_2 = (C_1/C_2)^n \Rightarrow 300,000/600,000 = (240,000,000/CP_B)^{0.6}$.

Problems:

- This method is in favour of batch system of production.
- Investment costs vary with location. For example, for green field, the construction cost would be higher and for countryside projects, we have to provide infrastructures.

3. Factorial Method of Cost Estimation

This method is used when we know the cost of main plant that is the cost of major machineries and equipments. But, we may not be able to know cost of certain auxiliary equipments, there fore add certain percentage of the known cost to avoid such constraint so as to obtain the total cost.

For example, cost of major machinery and equipment equal to Br. 200,000 and the addition based on experience and other factors are 32% of the cost of the main plant. Hence, the total cost:

$$TC = 200,000 + (32/100 \times 200,000) = \underline{264,000 \text{ Br.}}$$

Problems:

- It needs long years of experience
- The percentage varies from project to project
- It doesn't take in to consideration market information (i.e., it is highly simplified).

4. Pro forma Invoice /Quotations/ Offers

We take address of suppliers and ask them for the price of certain machineries. This is usually applied for small-scale projects. For larger projects, tendering is the most important. The tender can be open or closed. But during feasibility study the tendering process cannot be under taken because it is too costly.

5. Full Design Method:

This method is applicable for projects that involve in civil work.

Activity 4.10: Assuming W/o Eshet's Soap Factory, discuss in brief on the considerations she has to take in acquiring its machineries and equipments.

4.3.6. ORGANIZATION AND HUMAN RESOURCES

A. Organization

Organizational study deals with the development and design of the organization needed to manage and control the entire operation of the organization (establishment). Design of the organizational structure depends on the strategies of the organization.

Organization is the means by which the operational functions and activities of the enterprise are structured and assigned to organizational units represented by managerial staff, supervisors, and work force with the objectives of coordinating and controlling the performance of the enterprise and the achievement of its business targets.

Operational enterprises under take various interrelated activities (management aspect, financial aspect, commercial activities, safety of workers, etc). Therefore, plant organization tries to show how these interrelated activities are effected in the productive activities and it also shows the commanding chain (organizational chart) and how the chains are delegated in the enterprise. Thus, plant organization must show the optional coordination and control of the enterprise and cost aspects (direct and indirect costs).

The following significant steps must be used in designing the organizational structures:

1. State goals and objectives of the organization.
2. Identify the necessary functions to achieve the goal.
3. Group the functions which are related and that could be performed by a responsible individual.
4. Design the structure taking in to account the level and span of control.
5. Analyse and describe the key jobs (job description)
6. Work out qualification requirement and prepare recruiting and training program for staffing.

Organizational Description vs. Job Description

Organizational description involves in describing each functions such as describing the finance function, i.e., stating the various activities to be performed by the finance function.

Job description involves in describing, in black and white, the activities to be performed by each worker (employee).

B. Human Resource (Manpower) Requirement

Human resource requirement means determination of human resource requirement and cost for the project. It depends on the functions to be performed and organizational structure and considers:

- Skill mix
- Levels of skill particularly in the area of top management
- Number of workers in the given organizational function, such as number of workers in the finance function.

Human resource requirement has two aspects that is the requirement at:

1. The project implementation stage
2. The project operation stage

Training is needed in a project. The following steps should be followed in the training plan:

- Analyze personnel characteristics and conditions
- Analyze training requirement
- Workout:
 - The date (time) of training
 - The number of trainees
 - The category and places of training
- Give formal training
- Have on the job training
- Continuously up date the employees.

Cost Estimates for Human Resource Requirement

It usually comprises:

- Salary and wages
- Payroll costs
- Fringe benefits
- Overhead costs (include factory supplies, maintenance costs, office supplies, utilities, communication, rents, insurance, taxes, depreciation, interest, etc)
- Recruitment and training costs

Activity 4.11: Assuming W/t Senbetu's Hole Bricks Factory, make a brief human resource analysis and give her your expert opinion.

4.3.7. STRUCTURES AND CIVIL WORKS

It is divided in to:

- 1) Site preparation and development
- 2) Buildings and structures
- 3) Outdoor works

A. Site Preparation and Development

- Grading and leveling the site
- Demolition and removal of existing structures
- Relocation of existing pipelines, cables, roads, power line, etc
- Reclamation of swamps and draining and removal of standing water
- Connection of the site to the public utilities net work, etc

B. Buildings and Structures

- Factory or process buildings
- Ancillary buildings required for stores, warehouses, laboratories, maintenance service, utility supply centers, etc
- Administrative buildings
- Staff welfare buildings, cafeteria, medical service buildings
- Residential buildings

C. Outdoors Works

- Supply and distribution of utilities
- Handling and treatment of emission, wastages, and effluents.
- Outdoor lighting
- Landscaping
- Enclosure and supervision (boundary wall, fencing, barriers, gates, doors, security posts, etc)

Activity 4.12: Assuming W/o Eshet's Soap Factory, discuss in brief on the considerations she has to account in structures and civil works.

4.3.8. PROJECT CHARTS AND LAYOUTS

This defines the scope of the project and provides the basis for detailed project engineering and estimation of investment and production cost. Following are the major types of project charts and layouts:

A. General Functional Layout

- It shows the general relationship between equipments, buildings, and civil works
- Its primary consideration is to facilitate smooth and economical movement of raw materials, work in process, and finished goods. This means that:
 - The layout should seek to allow traffic flow in one direction, with a minimum of crossing
 - Godowns (warehouses), workshops, and other services must be functionally situated with respect to the main factory buildings.

B. Material Flow Diagram

It shows the flow of materials, utilities, intermediate products, final products, by-products, and emissions.

C. Production Line Diagram

It shows how the production would progress along with the key information for main equipments.

D. Transport Layout

It shows the distances and means of transport outside the production line.

E. Utility Consumption Layout

It shows the principal consumption points of utilities and their required quantities and qualities.

F. Communication Layout

It shows how the various parts of the project will be connected with telephone, telex, intercom, etc.

G. Organizational Layout

It shows the organizational setup of the project along with information on personnel required for various departments and their interrelationship.

H. Plant Layout

It is concerned with the physical layout of the factory. It considers:

- Consistency with production technology
- Smooth flow of goods from one stage to another
- Proper utilization of space
- Scope of expansion
- Minimization of production costs
- Safety of personnel

Activity 4.13: Assuming W/o Eshet's Soap Factory, define its organizational objectives and design its organization structure. Besides, define the functions of each functional department in the organization structure.

4.3.9. FINANCIAL ANALYSIS

To judge a project from the financial angle, we need information about the following:

- Cost of project
- Means of financing
- Estimates of sales and production
- Cost of production
- Working capital requirement and its financing
- Estimates of working results (Projection of profit)
- Break-Even Point
- Projected cash flow statements
- Projected balance sheet

A. Cost of Project

It represents the total of all items of outlay associated with a project that are **supported by long-term funds**. It is the sum of the outlays on the following:

- Land and site development
- Buildings and civil works
- Plant and machinery
- Technical know-how and engineering fees
- Expenses on foreign technicians and training of national technicians abroad
- Miscellaneous fixed assets
- Preliminary (associated with project identification, preparation, appraisal, etc) and capital issue expenses (associated with raising of capital)
- Preoperative expenses
- Provision for contingencies (For mitigating unforeseen expenses and price increases)
- Margin money for working capital (Come from long term sources in order to meet over-runs in capital cost)
- Initial cash losses

B. Means of Financing

To meet the cost of project, the following means of finance are available:

- Share capital
- Term loans
- Debenture capital (Debt capital)
- Deferred credit
- Incentive sources (seed capital assistance, capital subsidy, tax deferment or exemption)
- Miscellaneous sources (public deposit, leasing and hire purchase)

C. Estimates of Sales and Production

The starting point for profitability projection is the forecast for sales revenues. Sales and production are closely interrelated; hence, they may be estimated together taking in to account the plant capacity and the market potential of the product/service.

D. Cost of Production

Given the estimated production, the cost of production may be worked out. The major components of the cost of production are:

- Material cost
- Labour cost
- Factory overhead (Repairs and maintenance, rent, tax, insurance, utilities, etc)

E. Working Capital Requirement and Its Financing

The working capital requirement consists of raw material and components, stocks of goods in process (Work in process), stocks of finished goods, debtors and operating expenses (Supplies, prepayments, etc).

The principal sources of working capital finance are advances, trade credits, accruals and provisions, and long term source of financing.

F. Estimates of Working Results (Profitability Projection)

Given the estimates of sales revenues and cost of production, estimate the profitability projection.

G. Break-Even Point (BEP)

Identify the level of operation that should avoid losses. For this purpose, the **BEP**, which refers to the level of operation at which the project neither makes profit nor loss is calculated.

$$\text{BEP (In Units)} = \frac{\text{Fixed Cost}}{\text{Unit Contribution}}$$

Or

$$\text{BEP (In Dollar)} = \frac{\text{Fixed Cost}}{\text{Unit Contribution Ratio}}$$

The calculation of the BEP must be with reference to the fixed costs expected to incur when the project is supposed to reach the rated capacity utilization level (usually 90% - 100% capacity utilization).

H. Projected Cash Flow Statement

The cash flow statement shows the movement of cash in to (cash in flow or sources of cash) and cash out of the firm (cash out flow or uses of cash) and its net impact on the cash balance of the firm (net surplus/deficit).

I. Projected Balance Sheet

Prepare the projected balance sheet in order to reflect the financial condition (position) of the firm at a given point of time.

4.3.10. ECONOMIC ANALYSIS

Economic analysis is made in order to rectify the **economic viability** of the project. This analysis is undertaken from the point of view of the nation or the economy as a whole. Economic analysis can therefore be seen as a **cost-benefit** analysis from the national perspective. Economic viability is concerned with public '**profitability**' (unlike the **private profitability** under the financial analysis) which is based on economic resource flows which relates to:

- a) Social opportunity costs (shadow prices) which adjust market prices to take into account differences based on:
 - Taxes and subsidies
 - Monopolistic pricing
 - Price control and rationing
 - Quantitative trade restrictions
 - Over-valued (or under valued) exchange rate
 - Labour opportunity costs
- b) Divergence between real rate of interest and nominal (financial) rate of interest, and difference between private and social/public rate of discount.

In project planning, there are two main objectives to economic analysis. These are:

- To provide information for making decisions on the acceptability of projects from the national point of view.
- To provide information of value for project design and planning, macro economic planning, and economic research.

Economic analysis broadens the analysis from confining attention to the project itself to investigating the impact of the project on the national economy. To do this, a number of key steps need to be undertaken and these are common to most approaches to economic analysis of projects. Following these steps will help ensure that the project contributes to the achievement of some or all of the following important economic objectives that a government might consider important:

- Indicate the impact of project on the overall level of GNP and/or welfare.
- Help to take account of the possible balance of payment constraints.
- Help to take account of the problems of unemployment and underemployment
- Help to focus attention on the way the savings may influence the rate of growth of GNP.
- Show the contribution of the project towards alleviating any income inequalities.

Steps to Follow in the Economic Analysis of Projects:

Step 1: Identify and eliminate transfer payments

This may involve several stages and some transfer payments may be more obvious than others. In eliminating transfer payments, it is helpful to record which group makes the transfer payment and which receives the payment.

Step 2: Identify linkages and externalities

This step extends the definition or boundary of the project. Linkages and externalities may be easily quantifiable, while at other times identification and quantification of effects may be more difficult.

Step 3: Identify the effect on the use or creation of traded goods

This can show the effect of the project on the availability of foreign exchange. Foreign exchange may then be valued according to its scarcity value or opportunity cost. It may also be possible to estimate the effect of the project on the balance of payments.

Step 4: Identify the effect of the project on the employment of labour

This in particular identifies those categories of labour, which are in excess supply. In most cases this involves the identification of the payment of wages to unskilled workers and the estimation of the opportunity cost of their employment.

Step 5: Identify the effect of the project on the level of investment

This is usually taken to be the same thing as the effect on savings. Estimation of this effect requires some knowledge of the effect of the project on the distribution of income.

Step 6: Identify the effect of the project on the income distribution

This can show the effect of the project on the consumption of different income groups.

Activity 4.14: Discuss in brief the rationale for undertaking financial and economic analysis of a development projects. Moreover, explain the difference between financial and economic analysis briefly.

4.3.11. ENVIRONMENTAL ANALYSIS

The effects of actions that are not accounted for in the normal market transactions need to be considered explicitly in the decision-making processes on projects. These effects are to be identified, assessed, and evaluated against the economic advantages arising out of a given action. In this context, the environmental impact assessment/appraisal is considered to be one of the major project decision processes because it gives an opportunity to man to consider the effects of his/her actions on the environment.

Economic development is the result of the interaction between natural resources and technology supported by and designed for people. People are the centre for development. It is rightly said that all human activity, be it economic, social or anything else, is essentially directed at satisfying “needs” and “wants” of man through “altering” and “using” environmental resources.

The basic premise behind the Environmental Impact Assessment (EIA) is that no one has any right to use the precious environmental resources resulting in greater loss than gain to society. From this, it follows that the aim of EIA is to seek ways by which the project can proceed without any irreparable losses to environment and minimum losses if any, so that the net effect will be a desirable gain.

An Environmental Impact Analysis (EIA), therefore, is a study of the probable changes in the various socioeconomic and biophysical attributes of the environment, which result from a proposed project action.

Development project has two dimensions:

- The intended objectives/purpose – they are also called stated goals/benefits and
- The unintended consequence, also called externalities or social costs which are unplanned, unwanted, and unanticipated.

Environmental impact assessment thus studies the unintended consequence of a project. Its purpose is to identify, examine, assess, and evaluate the likely and probable impacts of a proposed development project on environment and, thereby, to work out the remedial action plans to minimize the incidence of adverse impact. It is not anti-development nor is it against the projects. Its goal is development without damage or least damage.

A. Stresses on Environment

There are four types of different stresses or pressures that are being continuously inflicted on environment. These are:

- **Eutrophic Stress**

It refers to the release of various kinds of wastes into the river and other water bodies and their consequent drying.

- **Exploitative Stress**

It refers to the exploitation of natural resources endowment for production and consumption purposes through agriculture, industry, extraction, fishing etc. It is important to note that the rate of exploitation has a relevance to the nature's capacity to reproduce.

- **Disruptive Stress**

It refers to the physical alterations in nature resulting from such activities like forest clearance, highways, railways, factory buildings and so on. These physical changes disturb the environmental and ecological balance.

- **Chemical and Industrial Stress**

It results mainly from the developments in "science and technology" and their applied fields like industry, warfare and agriculture. This comprises mainly the pollutants and effluents of all types, radiation etc.

Strategies to meet these threats to natural environment through pollution, destruction and over-use can be: preventive or b regulatory. It is in this context that the environmental appraisal of projects is gaining significance with a hope of achieving sustainable development in harmony with environment.

It is better to consider the environmental consequences during the project planning and design stage itself so as to avoid higher costs of future remedial actions by prudent planning and early preventive measures.

B. Objectives of EIA

- To identify and describe (in as quantified a manner as possible) the environmental resources/values (ER/Vs) or the environmental attributes (EA) which will be affected by the proposed project, under existing or "with or without project" conditions.
- To describe, measure, and assess the environmental effect that the proposed project will have on the ER/Vs (in as quantified a manner as possible), including positive effects which enhance ER/Vs as well as the negative effects which impair them. Direct or indirect and short term or long term effects are to be considered. This would also include the description of the specific ways by which the project plan or design will minimize the adverse effects and maximize positive effects.
- To describe the alternatives to the proposed project that could accomplish the same result but with a different set of environmental effects. Energy generation by thermal, hydro, and nuclear would explain the case in point. Further, alternative locations are also considered.

C. Methodology for Conducting an EIA Study

So far, there is no consensus on any particular procedure. This is because of the difficulties in quantifying the effect which are often intangible, complex, and imperceptible in nature. It is difficult to develop meaningful parameters to represent the effects and their quantification. The major problems in this regard are:

- The diffused nature of impact both over time and space; and the lags in impacts after the cause worked.
- An environmental effect is the joint product of several pollutants.
- Inadequacy of techniques to estimate the impacts and their costs.
- Since the impacts are imperceptible, people are not aware of the impacts.

At present, the generally accepted approach for making the EIS is an item by item review of effects on the individual environmental resources/values (ER/Vs), including both the identification of ER/Vs, and description and quantification of the effect to the extent possible. Thus, the project personnel should:

- Carry out the item-by-item review of the effects of the proposed project on the already identified individual ER/Vs embedded in the project environs.
- Arrange or group the effects in the environment in a systematic manner, preferably in a format.
- Prepare the remedial plans for mitigating the adverse effects on environment. They can be: corrective, compensatory, or enhancing.

4.3.12. GENDER ANALYSIS

Poverty and gender inequality are among the most pervasive and persistent global problems and challenges. Poverty affects women and men, but the impacts are different based on their sex, age, ethnicity, race, economic status, education, literacy, and disability. Gender inequality cuts across other forms of inequality, intersecting with economic, social, and political conditions, to often produce more intensified forms of poverty for women than for men.

Understanding gender terms and concepts is a key to developing effective strategies to reduce inequality, discrimination, and ultimately eliminate poverty. Besides, to understand what gender analysis is, it is useful to first understand the conceptual difference between the terms "sex" and "gender", and "gender equality" and "gender equity".

Sex refers to the physiological, biological and hormonal characteristics that define and differentiate humans as either female or male; they are universal.

Gender refers to the social attributes, opportunities and roles associated with being female and male and the relationships between and amongst women and men. What is expected, allowed and valued in a woman or man in a given context, society or culture at a specific time and place? They are learned, changeable over time, and vary widely within and across cultures.

Gender Equality refers to the equal rights, responsibilities, and opportunities of women and men. It does not mean that women and men become the same, but that their rights, responsibilities, and opportunities will not depend on whether they are born female or male.

Gender Equity refers to the fair treatment of women and men to produce equitable outcomes by taking account of and addressing the differences between and amongst the lives of women and men and the diversity of different groups of women and men.

WHAT IS GENDER ANALYSIS AND WHAT DOES IT TELL US?

Gender is a socio-economic variable for analysing roles, responsibilities, constraints, opportunities, and needs of men and women in a given context.

Gender analysis refers to the variety of approaches, and methods used to assess and understand the **differences in the lives** of women and men and **the relationships** between and amongst them including: their access to resources and opportunities, their activities, and the constraints they face relative to each other. It is a process that identifies the **varied and different roles and responsibilities** that women and men have in the family, the community, and in economic, legal, political, and social structures.

Gender analysis explores the nature of gender differences. In doing gender analysis, we systematically ask questions about differences between men and women in a given population, with respect to their:

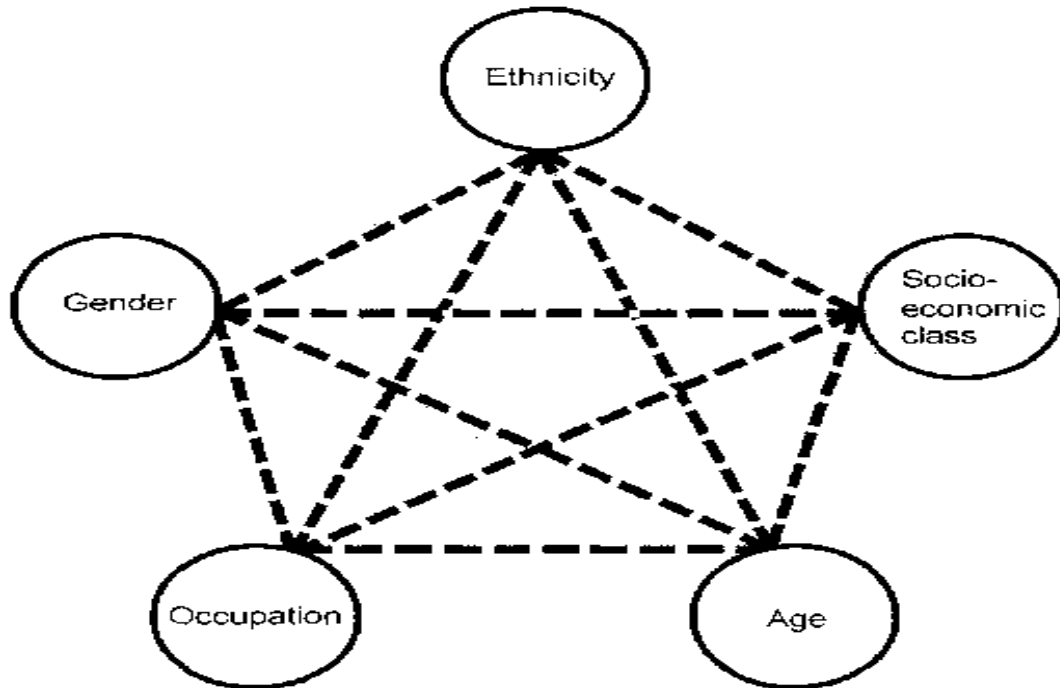
- Roles and activities (who does what: productive activities? who does the work? how long does it take? where is the work carried out? how rigid is the gender division of labour?),
- Resources and constraints (what resources do men and women have to work with? who uses/owns/controls each of these resources? what decisions do men and women make in the household and/or in the community? are constraints to participation in social and economic life different for men and women?), and
- Benefits and incentives (who controls productive activity and/or reproductive activity? who benefits from economic activity, who receives income, and/or who controls income? do men and women have different incentives for participation in these activities?).

In other words, gender analysis entails, first and foremost, collecting gender-disaggregated information about the concerned population.

Gender analysis facilitates a people-focused approach to development projects. It helps project personnel consider the potentially distinct interests and concerns of male and female beneficiaries. It highlights some of the ways participants need to be disaggregated if projects are to be designed and implemented considering the full range of beneficiary concerns.

Gender analysis does not present all the relevant people-related issues that need attention, instead it focuses on gender-based distinctions, one of several social dimensions that distinguish different sub-groups within any community. The full range of interdependent socio-cultural variables that influence different community member needs and priorities is broader, see the diagram below. Hence, even disaggregation by gender will group very heterogeneous sets of people together.

Figure 4.3: Variables in the Socio-Economic Context



Source: Adapted from FAO (1996)

Gender analysis makes visible:

- The different needs, priorities, capacities, experiences, interests, and views of women and men,
- Who has access to and/or control of resources, opportunities and power,
- Who does what, why, and when,
- Who is likely to benefit and/or lose from new initiatives,
- Gender differences in social relations,
- The different patterns and levels of involvement that women and men have in economic, political, social, and legal structures,
- Women's and men's lives are not all the same and often vary depending on factors other than their sex, such as age, ethnicity, race and economic status, and
- Assumptions based on our own realities, sex, and gender roles.

The assumption of the gender analysis is that the needs, interests and concerns of intended project participants are centrally relevant at every stage in the project cycle. It provides a means by which gender considerations can be integrated into projects:

- Who participants are intended to be? Who they are?
- What they do?
- What constraints they face?
- Which resources they have available to them?
- Which resources they have access to? Which they control?
- How their participation can be monitored?
- How the project's impact on beneficiaries can be determined?

The aforementioned questions are among the many issues that need more attention to address the multifaceted concerns in project's gender analysis. These show when participant-related information is going to be relevant and how that information can be gathered. The implementation and operation of these activities will naturally be more people-focused, take into consideration the relevant gender-related issues and lead to more effective and successful projects if:

- Local people are involved in the identification, design, implementation and evaluation of the project,
- "People-related" considerations are consistently the focus of the steps leading to implementation,
- Monitoring and evaluation emphasize the need to look at people, including gender-related aspects of the project, and
- The terms of reference for project personnel emphasize the need to consider and focus on people and gender-related issues.

WHY USE GENDER ANALYSIS?

Understanding the socio economic situation and with it, gender issues and challenges in our partner countries is integral to sound policy analysis, and is essential for effective development. Well targeted programs and projects that take into account the reality of gender roles and relations have a higher likelihood of sustainability and effective poverty reduction impacts.

Gender analysis can be used at various levels to inform different kinds of interlinked processes regarding the differential impacts on women and men.

- National - National policy frameworks of countries, including national development strategies and/or poverty reduction strategies, macro policies, public expenditure programs/budgets, legislation, regulations and procedures.
- Sector - Sector policies, strategies and implementation plans and operational guidelines.
- Sub-national - Provincial or district development plans, policies, strategies, budgets, legislation, regulations and procedures.
- Development programs - Community development plans, programs and projects and activities and donor development program and project identification, design and assessment.

WHEN DO YOU USE GENDER ANALYSIS?

Gender analysis is best applied at the earliest possible stage of a program or project to inform and shape the identification, design and planning of the most appropriate intervention. Gender analysis provides information and data on the differential impact of a specific program or project on females and males and on gender relations. Thus gender analysis is vital throughout the entire development process. The analytical findings and recommendations should be integrated at each stage of program and project planning, implementation, monitoring and evaluation.

Gender analysis examines the assumptions underpinning programs and projects and the interrelationship between social and economic factors. Thus, gender analysis:

- Can ensure that neither women nor men are disadvantaged.
- Can increase the likelihood that both women's and men's needs are addressed and that priority action areas for promoting equality between women and men are identified.
- Can enhance both the sustainability and effectiveness of development programs and projects and can enable nation-wide reporting on the achievement of gender equality outcomes.

4.3.13. WORK (IMPLIMENTATION) SCHEDULE

It reflects the plan of work concerning installation as well as initial operation. Its purpose is:

- To anticipate likely problems to arise during the installation phase and suggest possible means for coping with them.
- To establish the phasing of investments taking into account the availability of finances.
- To develop a plan of operations covering the initial period (the running-in period).

Often, it is found that the required inputs like raw material and power are not available in adequate quantity when the plant is ready for commissioning, or the plant is not ready when the raw material arrives. Thus to avoid losses arising from idle capacity and deterioration of stocks of material, work schedule should be drawn up with care and realism so that the commissioning of plant is reasonably synchronized with the availability of the basic input.

Activity 4.15: Assume that your best friend is badly in need of your advice for her residential house construction. Thus, list the series of activities she has to perform in priority (chronological order) along their required time to complete each activity for constructing the house.

4.3.14: CHAPTER SUMMARY

Feasibility analyses are carried out by the project manager in the process of evaluating a selected project idea. These analyses include market and demand analysis, raw materials and supplies analysis, production program and plant capacity analysis, technology analysis, financial analysis, economic analysis, environment analysis, gender analysis, etc.

There are number of steps in the market and demand analysis such as situational analysis and objectives specification, collection of data, market survey, market description, demand forecasting and market planning. The market and demand analysis helps the project manager to understand how the firm's abilities can be synchronized with market requirements. Market analysis studies market needs and consumer

preferences for a given project idea and demand analysis aims at calculating the aggregated demand for a particular product or service.

Technical analysis of a project idea includes designing the various processes, installing equipment, specifying material and prototype testing. The project manager has to be careful in finalizing the technical aspects of the project as the decision is irreversible and the investments involved may be high. The project manager has to select the technology required in consultation with technical experts and consultants.

The primary objective of any project is to earn reasonable returns for the investment made. The project manager must examine the financial feasibility of projects when selecting a project for implementation. The project manager uses two criteria to evaluate rate of returns of project investments: non-discounted criteria and discounted criteria. The time value of money is ignored in non-discounted criteria, but is considered in discounted criteria.

Also, the project manager studies each project proposal from the point of view of society. Project managers use Social Cost Benefit Analysis to study a project's impact on society. The United Nations Industrial Development Organization (UNIDO) has developed an approach, called UNIDO approach in this regard.

4.3.15: CHAPTER END ACTIVITIES

Assume that W/o Tigray identifies a “Bricks Project” to be constructed in your environment. Assume also that she is looking for your project expertise. Thus, based on your project feasibility study session, make the project’s market; raw materials and supplies; location, site, and environment; technology and engineering; organization and human resources; structure and civil works feasibility study with brief explanation.

CHAPTER FIVE: PROJECT PROPOSAL FORMULATION

INTRODUCTION

The success of a project is directly related to its success in solving the problem it was designed to solve. It is not only a question of doing things right but also doing right things- effectively, efficiently and economically.

Project formulation is a systematic and logical way of developing cost-effective solutions to development problems. Furthermore, it tries to ensure that once the problem is solved, it remains solved.

A proposal is a request for financial assistance to implement a project. It is not just a '**shopping list**' of things you want. A proposal must justify each item in the list of things you want, so that, say, a donor agency can decide if it wants to provide some or all of those things. The project proposal must reflect the background work you have already done and should be logically set out. It is not enough to write a letter stating your request. You have to demonstrate the need and prove that the project is worth of funding. Remember that there will be many other organizations and individuals competing for the funds.

LEARNING OBJECTIVE

After studying this chapter, you should be able to understand how to formulate a project proposal.

5.1. COMPONENTS OF A PROJECT PROPOSAL

Before beginning to write a proposal, keep in mind the following points (Gizaw, 2003):

- Clarify the purpose of your project
- Define the scope of work to focus your funding search
- Determine the broad project goals, and then identify the specific objectives that define how you will focus the work to accomplish those goals.
- Be aware that there are a number of grant making organizations, and which may be most appropriate for (likely to support) your project.
- Identify the requirements of the grant-making agency, and be certain that your project fulfils them.
- Make certain that the resources you seek can be obtained from the grant making organization that you contact
- Understand what is expected of you from the grant-making agency in exchange for the support they may deliver.

Furthermore,

- Request proposal guidelines. Also request a list of project previously funded. Perhaps an annual report is available.
- Inquire about the maximum amount available. Also, find out the average size and funding range of awards
- Determine if funding levels of the grant you select are appropriate for your project. Note whether there is a funding floor or ceiling.

When you have found a variety of grant sources that look promising, you need to contact those sources through a letter or phone call. Most grantors have employees who serve as the grant contact.

Try to develop a relationship with grant contacts. These people know their criteria for funding, and they are willing to tell you whether or not you have a chance of getting your program/project funded.

A project proposal will contain the following main elements. It should be noted that customs, practices, rules, and laws concerning the proposals may vary from nation to nation as well as from donor to donor. But, still the underlying questions and concepts will be the same (Gizaw, 2003; ICMR, 2007; Jergeas and Cooke, 1997; Meredith and Mantel, 2006; Roman, 1986; Rosenau, 1991).

1. PROPOSAL TITLE

In choosing your proposal title, keep interest of your reader in mind. Make it persuasive, positive and one that will capture attention.

2. COVER LETTER

The cover letter is important because it is the first piece of information about your proposal read by a funder. In writing the cover letter, you should:

- Quickly gain the reader attention
- Show why the particular agency should be interested in your proposal
- Convey the importance and urgency of your project
- Keep it short
- Make it look good

3. EXECUTIVE SUMMARY

This section clearly and concisely summarizes the request. It should provide the reader with a framework that will help the funder visualize the project.

4. ORGANIZATION INFORMATION/INTRODUCTION

This part of the proposal describes the organization that seeks funding. It briefly summarizes the organization's history, mission, clients and track record of achievement. It should also include current programs undergoing by the organization. If there are many or complex programs run by the organization, an organization chart or other attachment that explain them could be added.

Some background information about the location, how the organization is managed and does work and other details that build the credibility of the organization should be included in this part of the proposal, i.e. evaluation of your program, letters of support and referring agents.

5. BACKGROUND /PROJECT CONTEXT

This part of the project proposal gives some background information on the place where the project is going to be located. It could include the geographic and climatic information, political and administrative scenario and socio-economic status, etc.

6. PROBLEM/ NEED STATEMENT

The problem/need statement or situation description is a key step in grant proposal writing. It is where you convince the funder that the issue you want to tackle is important and shows that your organization is an expert on the issue.

In developing problem/ need statement:

- State the problem/need using facts and figures
- Use statistics that are clear and support your argument
- If possible use research and comparative statistics
- Don't assume the funder knows much about your subject area.
- Describe why this need/situation is important
- Describe your issue in as local a context as possible or organization focus.

7. PROJECT GOALS AND OBJECTIVES

The goal and objectives are the outcomes of the planned project and they answer the question, "how would the situation look if it were changed?"

A goal is a broad statement of the ultimate result of the change being undertaken. A result that is sometimes unreachable in the short term. Goals are often written for the organization as part of a long-range planning process.

An objective is a measurable, time-specific result that the organization expects to accomplish as part of the grant. It is much more narrowly defined than a goal. Like the goal, the objective is tied to the need statement.

Good objective also answer the following five questions:

- | | |
|------------------|-------------------------------|
| * When | Time |
| * Where..... | Plan of Action |
| * Who..... | Client |
| * What | Expected Outcome |
| * How much | Percentage problem is reduced |

8. PROJECT OUTPUTS

Outputs are the results of project activities (services made available, infrastructure built, financial products, human resources trained, etc) intended to achieve the immediate objectives.

If an objective is to "strengthen capacity of the ABC institute to perform XYZ" then relevant outputs could be "2,000 XYZ operators trained, a manual of XYZ operational guidelines produced, instructor trained to provide on going XYZ training, etc." Outputs are tangible and visible.

9. ACTIVITIES

Activities are the action taken to produce the outputs. For example, to achieve one of the outputs given above: "2,000 XYZ operators trained", relevant activities might be: the design and development of training materials; equipping a training center; identifying and training an instructor; running 100 training courses by the end of 200x and so on.

Activities take place over time and are coordinated to be complete by the date required in the description of the output. They are often expressed in the form of bar charts. A planning calendar (possibly visualized) indicating the beginning of each of the projects activities, their sequencing and duration has to be included in most project documents.

10. INPUTS

Inputs are the financial (budgets: specify if self-financed or externally- financed), material (equipment, logistics) and human resources (project team, partner organization) necessary for carrying out the activities.

These may be at various levels; international, regional, national, institutions, the ultimate beneficiaries. It is necessary to indicate who is providing the inputs. Some donors require separate budgets for each source of input.

If the project is to be "sustainable", capable of carrying on after the completion date of the project, then the identification of key local resources is likely to be crucial to the achievement of sustainability. Similarly, if the ultimate beneficiaries are, or include women and children, then making provision for their involvement is an essential input.

Make input requirements as detailed as possible and justify any specific requirements to avoid, for example, unsatisfactory substitutions of equipment at a later stage. Use your imagination and make reasonable guess estimates rather than leave blanks. At least any one reviewing your document will have some idea of what you had in mind. A project proposal should be self-sufficient; there can be no guarantee that it will be discussed with you before a decision is taken.

11. ORGANIZATION AND ADMINISTRATION

The project's internal organization as well as its relations to partner organizations has to be expressed in hierarchical and operational terms. Are the collaborations with institutions or individuals, permanent or occasional, contractual or informal?

Indicate where the project is located: headquarters and/or decentralized units.

12. MONITORING AND EVALUATION

A proposal must include a plan for determining the degree to which objectives are met and methods are followed. This section is extremely important as funder pay particular attention to monitoring and evaluation methods since they need help to determine whether a proposed project represents an intelligent investment for them. Depending on the size of the project, monitoring and evaluation could include the following information:

- Who should monitor and evaluate?
- What to monitor and to evaluate?
- How to monitor and evaluate? And
- Resource requirements.

13. PHASE OUT STRATEGY AND SUSTAINABILITY

Local institutions or communities who will takeover the project have to be identified and indicated. Furthermore, if you continue this project in the future, how will it be supported? This is a difficult question to answer effectively. Most funders don't want to support the same set of project forever. What the funder really wants to see is that you have a long-term vision and funding plan for the project. This is important not only for the funder but the success of the project of the organization.

14. PROJECT BUDGET

Budgets are cost projections, a window into how projects will be implemented and managed. Well-planned budgets reflect carefully thought out projects. Attach a one or two-page budget showing expected expenses and income for the project.

Expenses:

- Personnel expenses
- Direct Project expenses
- Administrative or overhead expenses

Income:

- Earned income
- Contributing income (cash and in kind)

5.2. FINAL PROPOSAL CHECKLIST (Gizaw, 2003)

- Determine which project ideas have the best chance of being funded.
- Form a planning team that includes those affected by the project, community leaders, key staff and volunteers, and other organizations with similar or complementary projects.
- Conduct thorough research to determine funding sources interested in the project.
- Read all funding source materials to ensure their directions are followed while writing the proposal.
- Prepare the proposal components by stating the need or problem being addressed, the objectives and methods to meet the need, how the project will be evaluated and funded in the future, and the budget.
- Prepare the final proposal components: the introduction, summary, and cover letter.
- Determine those features in the project that may set it apart from others and will appeal to the funder. Make sure those features are highlighted for the funder.
- Ensure the proposal is clear and well write by having at least one person review it and give you feedback.
- Include the appendices requested by the funder.
- Check funder deadlines and the number for proposal copies to be submitted in order to meet their requirements.
- Give copies of the proposal to the planning team and other individuals or groups who should be aware of the project.

5.3. LOGICAL FRAMEWORK ANALYSIS (LFA)

Logical Framework Analysis (LFA) is a useful tool for sound project design. It is a way of testing the logic of a plan of action by analyzing it in terms of its means and ends. This helps to (Gizaw, 2003; ICMR, 2007; Meredith and Mantel, 2006):

- Clarify how the planned activities will help to achieve the objectives
- Be explicit about the implications of carrying out the planned activities in terms of resources, assumptions and risks.

The logical framework is a tool that provides a structure for specifying the components of a project and the logical linkages between a set of its means and ends. For example,

- If the inputs are available, then the activities will take place.
- If the activities take place, then the outputs will be produced.
- If the outputs are produced, then the immediate objective will be achieved.
- If the project objective is achieved, in the long run, combined with other development objectives/goals, will contribute to the attainment of the national development objective.

The logical frame consists of a matrix that has four columns and four rows. The rows represent the levels of the project objectives, including the means required to achieve them (the horizontal logic). Besides, the columns indicate how the achievement of these objectives can be verified (the vertical logic). The processes and components of the logical frame are illustrated in Exhibit 5.1 below.

Activity 5.1: Briefly discuss on the rational for conducting development project’s logical framework analysis.

Exhibit 5.1: Structure for a Logical Framework Matrix (Gizaw, 2003)

NARRATIVE SUMMARY	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
GOAL: Description of the higher-level objective to which the project will contribute.	Qualitative and/or quantitative measures or parameters used to show the extent to which the goal is met or fulfilled.	Sources of information and methods, the means, for verifying (checking) indicators-used to establish what has been achieved.	GOAL SUSTAINABILITY: Main external conditions/events necessary to sustain the objective in the long term (the supper goal).
PURPOSE: Description of the impact or effect the project is expected to achieve as a result of its output.	Qualitative and/or quantitative measures or parameters used to show the extent to which the purpose is met or fulfilled.	Sources of information and methods, the means, for verifying (checking) indicators-used to establish what has been achieved.	PURPOSE TO GOAL: Main external conditions/events over which the project has no control but which must prevail if goal is to be achieved.
OUT PUTS: Descriptions of the results the project should achieve during its lifetime.	Qualitative and/or quantitative measures or parameters used to show the extent to which the out puts are produced.	Sources of information and methods, the means, for verifying (checking) indicators-used to establish what has been achieved.	OUT PUT TO PURPOSE: Main external conditions/events over which the project has no control but which must prevail if purpose is to be achieved.
ACTIVITIES: Description of the activities that the project will undertake to produce its stated outputs.	INPUTS: Goods, facilities and/or services needed to carry out the stated activities.	MONITORING: Means to be used to check (monitor) the progress of the project’s activities.	ACTIVITY TO OUT PUT: Main external conditions/events over which the project has to control but which must prevail if out puts are to be achieved.

5.4. CHAPTER END ACTIVITIES

By referring your W/o Tigray’s “Bricks Project” feasibility study and your project proposal formulation session, formulate its structured project proposal.

CHAPTER SIX: PROJECT FINANCIAL ANALYSIS (APPRAISAL)

INTRODUCTION

Project appraisal is the comprehensive and systematic assessment/audit of all aspects of a proposed project. The project will be appraised by donor/sponsor agencies for funding. Funding decision will be made based on careful consideration of the project and its perspective to ensure that the project represents a high-priority use of the donors' resources.

It consists of a comprehensive and systematic review of all aspects of a project proposal. Appraisals should cover technical, financial, economic, institutional, etc aspects of a project, each of which must have been given special consideration during the project preparation/formulation stage. However, this course will cover in detail the financial, economic, environmental, and gender appraisals.

Before a project is implemented or rejected, it should be presented in a form that describes accurately its structure and objectives; analyses its various aspects carefully; evaluates its costs and benefits properly. When these things are ready, a decision will be made as to whether the project should be accepted or rejected. For this purpose, discounting and non-discounting financial project appraisal methods or criteria have been developed.

LEARNING OBJECTIVES

After studying this chapter, you should be able to:

- Understand the multi but interrelated aspects of a project appraisal/audit.
- Understand the alternative discounting and non-discounting financial decision/appraisal methods.
- Understand the projection of project's financial costs and benefits over its life.
- Understand how to make financial appraisal.

6.1. WHAT DONORS APPRAISE?

Who appraise a project? Project personnel formulate a project and project proposal for approval, often, by resource providers/donors. During the appraisal process, the donor will check whether or not the project belongs to sector focus area of the donor, meets the urgent needs of the community, is of optimum size (is just the right time or is it premature?), and is well designed, with reasonable cost and benefit estimate. Besides, the appraiser will ask the following questions (Chandra, 1995, 2006; Gizaw, 2003; ICMR, 2007; Joy, 1994; Meredith and Mantel, 2006; UNIDO, 1991):

- Have the objectives of the project been clearly stated?
- How does the project fit into the development priorities of the donor?
- Is the size of the project realistic with regard to the capacity of the organization?
- Are the proposed method and process appropriate?
- Is the project site appropriate?
- Is the source of financing clearly identified (community contribution, NGO's contribution, etc)?
- Is the amount of money required to implement and operate the project adequate?
- Is proper cost estimate done for the project?
- Is the project in a sector that merits priority?
- What are the likely contributions of the project?
- What are the likely risks, and where are the weak points in the project?
- Does the organization have the capacity required to manage the project?
- Is the organization structure of the project clearly defined?
- Are the project activities socially and culturally acceptable?
- Is the project gender sensitive?
- Which economic and social groups will benefit from the project (women, youth, elder, disabled, etc.)?
- Are there significant social barriers or customs to respect?
- Does the project involve the sustainable use of natural resources (if applicable)?
- What effect does the project have on natural ecosystems (such as soil, water, forests, etc.), if applicable?

Activity 6.1: Briefly discuss why resource providers appraise development project proposals.

6.2. PROJECT FINANCIAL APPRAISAL'S DECISION CRITERIA METHODS

Usually the decision criteria are divided into two groups: non-discounting and discounting measures. The first group does not take into account time preference while the second group is more appropriate decision criteria because they include time preference, discounted value, into the computations (Chandra, 1993, 1995, 2006; Gitman, 2000; Gizaw, 2003; Van Horne, 1998).

6.2.1. NON-DISCOUNTING MEASURES

The non-discounting criteria to appraise projects do not consider the time value of money. The **dominance and normalizing, pay back period, average rate of returns** (average return and average yearly net return) and **urgency** are the appraisal methods included in non-discounting criteria.

a. Dominance and Normalizing

Dominance can be strong dominance or weaker dominance. If a project is expected to cost less and to have higher **producer's surplus** for each year of its life and to last longer than the alternative, we call it strong dominant project. On the other hand, when, for example, projects are identical except for a single expected value, the project with a smaller initial cost or a single larger producer's surplus will be the preferred one, other things being equal. It is the single difference that determines the decision. This type of project is called weaker dominant project.

Table 6.1: Strong Dominance

Producer's Surplus					
Project	Initial cost	Year 1	Year 2	Year 3	Year 4
1	\$20,000	\$10,000	\$10,000	\$10,000	\$5,000
2	\$30,000	\$ 8,000	\$ 9,000	\$ 9,000	0

Since project 1 is preferable to project 2 in all respects, we say that project 1 dominates project 2.

Table 6.2: Weaker Dominance

Producer's Surplus					
Project	Initial cost	Year 1	Year 2	Year 3	Year 4
1	\$20,000	\$10,000	\$10,000	\$10,000	\$5,000
2	\$20,000	\$10,000	\$10,000	\$10,000	\$4,000

Project 1 dominates project 2 for the producer's surplus during year 4.

It is unlikely that actual projects will be as directly comparable as the above examples suggest. Real proposals almost vary in both their initial costs and producer's surplus. The relative merits of dissimilar proposals become evident only once they have been made comparable by normalizing the benefits and costs that is converting the projects to the base of an assumed common initial expenditure.

Table 6.3: Normalizing Projects

Producer's Surplus					
Project	Initial cost	Year 1	Year 2	Year 3	Year 4
1	\$20,000	\$10,000	\$10,000	\$10,000	\$ 5,000
2	\$80,000	\$30,000	\$30,000	\$30,000	\$15,000
Normalize 2	\$20,000	\$ 7,500	\$ 7,500	\$ 7,500	\$ 3,750

Normalizing project 2 with respect to project 1, dividing its initial cost and surpluses by 4, the two projects prevail a common initial expenditure of \$20,000 and that the producer's surplus are comparable. When we compare the first row and the third row of the table, we see that project 1 clearly dominates project 2. For each dollar spent, project 1 has the higher streams of expected net surplus.

b. Payback and Cut-off Periods

This technique concern with the number of years it takes to earn revenues sufficient to cover the costs. It involves asking this question. How long does it take to get back (or recuperate) my money?

The standard approach involving the use of the concept of a payback period (or the recoup method) ranks the proposals by the amount of time it would take to recover the initial investment. Then, the project with the shortest payback period is selected first, followed by the one with the next shortest, and so on until the available investment funds are exhausted or some other limit is reached.

Cut-off period, on the other hand, is the maximum period of time determined by the analyst to recover project's initial investment. A single proposal will be pursued if its capital cost (initial investment) can be recovered with in the cut off period; if not, the project will be rejected.

These two techniques may be suited for the analysis of projects where the goal of a quick investment recovery is itself reasonable. However, these techniques ignore the pattern in which payments are expected to occur including those beyond the payback and cut off point and do not consider time preference and discounting.

Table 6.4: Project Choices

Producer's Surplus								
Project	Initial Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
1	\$50,000	\$10,000	\$40,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
2	\$50,000	\$40,000	\$ 7,000	\$ 2,000	\$ 1,000	\$10,000	\$10,000	\$10,000
3	\$50,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$ 5,000	\$ 5,000
4	\$50,000	\$30,000	\$10,000	\$10,000	\$10,000	\$ 5,000	\$ 4,000	\$ 1,000

Table 6.5: Payback and Cut-off Periods

Project	Payback period (Years)	Ranking	Three year cut-off
1	2	1 st	Accept
2	4	3 rd	Reject
3	5	4 th	Reject
4	3	2 nd	Accept

b. Average Rate of Return (Average Return and Average Yearly Net Return Methods)

The criterion of the average return involves dividing the sum of expected producer's surplus by the initial cost figure. Proposals under review are ranked from the highest average return ratio to the lowest.

$$\text{Average Return} = \frac{\sum \text{Producer's Surplus}}{\text{Initial Cost}}$$

Table 6.6: Average Return

Project	Sum of producer's Surplus	Initial Cost	Average Return	Ranking
1	\$100,000	\$50,000	200%	1 st
2	80,000	\$50,000	160%	2 nd
3	60,000	\$50,000	120%	4 th
4	70,000	\$50,000	140%	3 rd

The average return criterion recognizes all of the returns over the life of the investment. However, it does not produce reliable rankings. If the projects are not of similar duration and it doesn't consider time preference and discounting.

Average Yearly Net Return (AYNR), which is a variation of the average return, allows the comparison of projects of different life times through computation of the average percentage return on the initial investment per year. Under this technique, for a single project to be accepted, the average yearly net return must be at least the rate of interest available in the company and at least the current interest rate.

$$\text{Average Yearly Net Return} = \frac{\sum \text{Producer's Surplus} - \text{Initial Cost}}{(\text{Initial Cost}) (\text{Number of Years})}$$

Table 6.7: Average Yearly Net Return

Project	Sum of producer's Surplus minus Initial Cost	Number of Years	Initial Cost	Average yearly Net Return	Ranking
1	\$30,000	6	\$50,000	10%	1st
2	\$30,000	10	\$50,000	6%	2nd
3	\$10,000	5	\$50,000	4%	4th
4	\$20,000	8	\$50,000	5%	3rd

The average yearly net returns technique attempts to recognize the importance of forgone opportunities by incorporating interest; its chief requirement is that the project earn the interest foregone, on the average. However, it doesn't incorporate time preference and discounting.

Note that although the preliminary project appraisal criteria discussed can certainly be useful in some cases, none of them take into account risk and uncertainty, time preference, and discounting.

d. Urgency

According to the urgency method, projects that are more urgent get priority over those that are less urgent. It is subjective criterion that can be defined in certain situations like failure of an important machine that affects the entire operation. Therefore, when there are two or more projects that require funds, only those that are more urgent will be funded.

Activity 6.2: Appraise and give your expert opinion on the following two projects using (1) dominance, (2) average return, and (c) pay back period (assuming the cut-off pay back period is 3 years).			
		<u>Project A</u>	<u>Project B</u>
Initial Investment (t_0)		\$50,000	\$75,000
Cash Inflows	Year 1	15,000	40,000
	2	5,000	12,000
	3	40,000	8,000
	4	10,000	10,000
	5	10,000	10,000

6.2.2. DISCOUNTING MEASURES

The discounting criteria to appraise projects consider the time value of money. The three discounting value project criteria in frequent use to decide whether a single project proposal is acceptable or not are: Benefit-Cost Ratio (BCR), Net Present Value (NPV), and Internal Rate of Return (IRR). These three-decision criterions yield the same decision for a single project where resource statements are drawn up using the same information and assumption.

a. Benefit-Cost Ratio (BCR)

For a project to be acceptable, the discounted value of its benefits should exceed the discounted value of its costs. Discounted benefits can be expressed in a ratio to discounted costs.

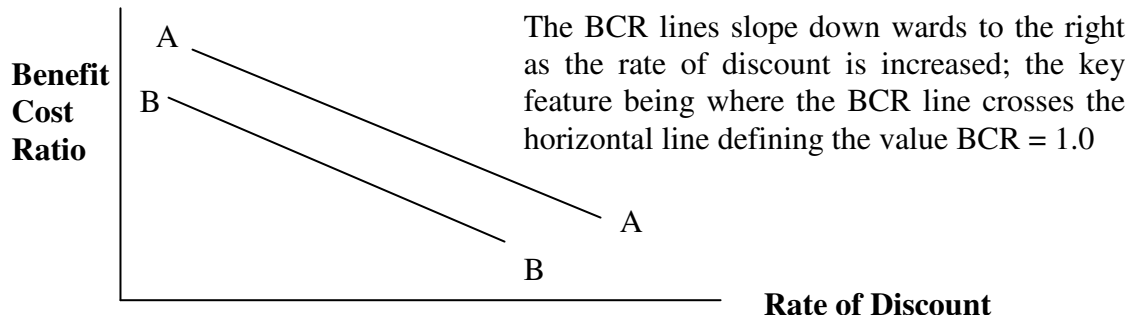
$$\text{BCR} = \frac{\sum \text{Discounted Benefits}}{\sum \text{Discounted Costs}}$$

Then, the BCR can be used for decision making as follows:

- If $\text{BCR} > 1.0$, accept the project proposal,
- If $\text{BCR} < 1.0$, reject the project proposal, and
- If $\text{BCR} = 1.0$ there will be no net effect whether the project proposal is accepted or not.

The BCR for a project will depend not just upon the estimated future project effects but also up on the rate at which they are discounted. The decision whether to accept the proposal or not, therefore, depends on the value of the discount rate (the opportunity cost of resources) at which decisions are made.

Figure 6.1: Benefit-Cost Ratio (BCR)



b. Net Present Value (NPV)

NPV is the result for which discounted costs are subtracted from discounted benefits.

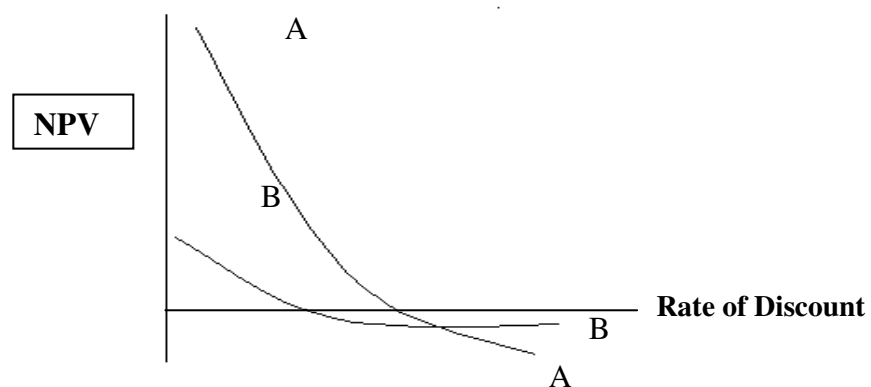
$$\text{NPV} = \Sigma \text{ Discounted Benefits} - \Sigma \text{ Discounted Costs}$$

The decision criterion using the NPV can be expressed formally as follows:

- If $\text{NPV} > 0$, accept the project proposal,
- If $\text{NPV} < 0$, reject the project proposal, and
- If $\text{NPV} = 0$, the project will have no net effect whether it is accepted or not.

Like the BCR, the NPV will vary with the rate of discount. The NPV for a project resource statement also slopes down to the right as the discount rate is increased.

Figure 6.2: Net Present Value (NPV)



The key features of the NPV curves are the value they take at the discount rate. Another key feature of the NPV curves is the points at which they cross the horizontal axis. The NPV curves cross the horizontal axis at the rate at which the discounted value of benefits is equal to the discounted value of costs.

c. Internal Rate of Return (IRR)

The rate of discount at which the NPV curve crosses the horizontal axis for a particular project resources statement [**Discounted Benefit = Discounted Cost**], where NPV = 0, is the IRR. Besides IRR may exist where the BCR line crosses the horizontal line at BCR = 1.0. IRR represents a rate of return on all the resources committed in a project.

For a project to be accepted, it should generate an IRR at least as great as the opportunity cost of resources. The decision-making criterion using the IRR is:

- If $IRR > d$, accept the project proposal,
- If $IRR < d$, reject the project proposal, and
- If $IRR = d$, the project will have no net effect whether it is accepted or not.

Where, d = opportunity cost of resources.

ILLUSTRATION ON DISCOUNTING-MODELS OF THE FINANCIAL APPRAISAL TECHNIQUES

A firm can make either of the two investments, Project A or Project B, at time 0. assuming a RRR (k^*) of 14% and a cut-off point for PBP of 4 years, 1) determine for each project (a) PBP, (b) NPV, (c) BCR, and (d) IRR; and 2) forward your professional opinion on accepting or rejecting the projects.

Initial Investment (t_0)		Project A (P_A)	Project B (P_B)
Cash In Flows		\$28,000	\$28,000
Year 1		8,000	5,000
	2	8,000	5,000
	3	8,000	6,000
	4	8,000	6,000
	5	8,000	7,000
	6	8,000	7,000
	7	8,000	7,000

Solutions:

1a) Pay Back Period (PBP)

- Project A = 3 Years + $(\$4,000/\$8,000 * 12 \text{ Months}) \Rightarrow$ 3 Years and 6 Months.
- Project B = 3 Years + $(\$4,000/\$6,000 * 12 \text{ Months}) \Rightarrow$ 3 Years and 8 Months.

Opinion:

Both projects account PBP less than the cut-off PBP, i.e., 4 Years. However, the firm is interesting to invest on only either of the two projects. The two projects are mutually exclusive. Therefore, accept Project A because its PBP is shorter than that of Project B.

Year	Project A (I_0) = \$28,000		Project B (I_0) = \$20,000	
	Cash In Flows (CIFs)	Cumulative CIFs	Cash In Flows (CIFs)	Cumulative CIFs
1	8,000	8,000	5,000	5,000
2	8,000	16,000	5,000	10,000
3	8,000	24,000	6,000	16,000
4	8,000	32,000	6,000	22,000
5	8,000	40,000	7,000	29,000
6	8,000	48,000	7,000	36,000
7	8,000	56,000	7,000	43,000

1b) Net Present Value (NPV)

For Project A, use the annuity present value table for discounting its future cash inflows, because it has annuity (regular) future cash inflows.

$PV \text{ of CIFs} = \text{Annuity CIF} * PVIFA (14\%, 7 \text{ Years}) \Rightarrow \$8,000 * 4.2883 \Rightarrow \mathbf{\$34,306.40}.$

NPV of $P_A = \$34,306.40 - \$28,000 \Rightarrow \mathbf{\$6,306.40}$. This NPV is when $I_o = \$28,000$. What is the NPV when the $I_o = \$20,000$ (i.e., Normalize Project A to Project B)?

$\mathbf{\$20,000/\$28,000 * \$6,306.40 = \$ 4,504.57.}$

For Project B, use the \$1 present value table for discounting its future cash inflows, because it has irregular future cash inflows.

Year	CIFs (\$) (1)	Present Value Interest Factor (PVIF, 14%,7Years) (2)	Present Value (PV) (3) = (1) * (2)
1	5,000	0.8772	\$4,386.00
2	5,000	0.7695	3,847.50
3	6,000	0.6750	4,050.00
4	6,000	0.5921	3,552.60
5	7,000	0.5194	3,635.80
6	7,000	0.4556	3,189.20
7	7,000	0.3996	2,797.20
		Total Present Value (PV)	\$25,458.30
		Less: Initial Investment (I_o)	\$20,000.00
		Net Present Value (NPV)	\$ 5,458.30

Opinion:

Accept Project B because its relative NPV is positive and greater than that of the normalized NPV of Project A (i.e., \$4, 504.57). Note that NPV requires normalizing when the Projects I_o is different because NPV results in cumulative effects over the project’s life; usually the higher investment yields the higher benefit. But, the BCR and IRR do not require normalization because BCR and IRR measure the return on \$1 investment.

1c) Benefit - Cost Ratio (BCR)

$BCR (P_A) = PV \text{ of CIFs}/I_o \Rightarrow \$34,306.40/\$28,000.00 \Rightarrow \approx 1.23$
 $BCR (P_B) = PV \text{ of CIFs}/I_o \Rightarrow \$25,458.30/\$20,000.00 \Rightarrow \approx 1.27$

Opinion:

Accept Project B because its return for \$1 investment (i.e., \$1.27) is greater than that of the Project A (i.e., \$1.23).

1d) Internal Rate of Return (IRR)

The determination of project’s IRR is a trial and iterative process. It is time consuming, thus the following short-cut method is recommended.

Step 1: Compute Average Annual Cash in Flow (AACIF)

$AACIF = \sum \text{CIFs}/N$, where N is project life.

Step 2: Compute Present Value Interest Factor of Annuity (PVIFA)

$PVIFA = I_o/AACIF$

Step 3: Identify the range of 'r' in which the PVIFA (k,n), i.e., Step 2, falls given the project life with the help of the annuity present value table.

$$L_r \text{ ----- PVIFA}(k,n) \text{ ----- } H_r \text{, where k is cost of capital.}$$

Step 4: Compute, independently, the PV of CIFs for each candidate project at the lower rate (L_r) and the higher rate (H_r) by using:

- a) PVIFA table if the project's CIFs is annuity
- b) PVIF of \$1table if the project's CIFs is irregular.

Step 5: Compute IRR, independently, by using either of the following formulas

$$\text{IRR at } L_r = L_r + d_r [(PV \text{ at } L_r - I_0) / (NPV \text{ at } L_r - NPV \text{ at } H_r)]$$

Or

$$\text{IRR at } H_r = H_r - d_r [(PV \text{ at } H_r - I_0) / (NPV \text{ at } L_r - NPV \text{ at } H_r)]$$

Where, d_r is change in H_r and L_r .

Check that the resulted IRR is in between the L_r and H_r . If it is outside this range; there might be mistake in your arithmetic calculations. IRR is where NPV is 0. NPV at L_r is positive and NPV at H_r is negative. Therefore, the NPV = 0 must be between L_r and H_r .

Project A

Step 1: Average annual CIF = \$8,000, because it is annuity.

Step 2: PVIFA = \$28,000/\$8,000 => 3.5000

Step 3: L_r ----- PVIFA ----- H_r
 At 20% (3.6046) ----- 3.5000 ----- At 24% (3.2423)

Step 4: i) PV at L_r (20%, 7Years) by using the annuity present value table:
 $\$8,000 * 3.6046 = \$28,836.80$

ii) PV at H_r (24%, 7Years) by using the annuity present value table:
 $\$8,000 * 3.2423 = \$25,938.40$

Step 5: i) $\text{IRR at } L_r = L_r + d_r [(PV \text{ at } L_r - I_0) / (NPV \text{ at } L_r - NPV \text{ at } H_r)]$
 $\text{IRR} = 20\% + (24\% - 20\%) [(\$28,836.80 - \$28,000) / (\$836.8 - (\$2,061.60))]$
 $20\% + 4\% [\$836.80 / \$2,898.40]$
 $20\% + 1.15\%$
 $\approx 21.15\%$

ii) $\text{IRR at } H_r = H_r - d_r [(PV \text{ at } H_r - I_0) / (NPV \text{ at } L_r - NPV \text{ at } H_r)]$
 $\text{IRR} = 24\% - (24\% - 20\%) [(\$25,938.40 - \$28,000) / (\$836.80 - (\$2,061.60))]$
 $24\% - 4\% [\$2,061.60 / \$2,898.40]$
 $24\% - 2.85\%$
 $\approx 21.15\%$

The IRR for Project A where it's NPV = 0 is $\approx 21.15\%$ in both the H_r as well as L_r . The 21.15% is with in the range of the higher and lower rate, i.e., 20% to 24%. Thus, the arithmetic computation is correct.

Project B

Step 1: Average annual CIF = \$43,000/7Years => \$6,142.86.

Step 2: PVIFA = \$20,000/\$6,142.86 => 3.2558

Step 3: L_r ----- PVIFA ----- H_r
 At 20% (3.6046) ----- 3.2558 ----- At 24% (3.2423)

Step 4: i) PV at L_r (20%, 7Years) by using the \$1 present value table:

ii) PV at H_r (24%, 7Years) by using the \$1 present value table:

PV at L_r (20%,7Years)				PV at H_r (24%,7Years)			
Year	CIFs	PVIF	PV	Year	CIFs	PVIF	PV
1	\$5,000	0.8333	\$4,166.50	1	\$5,000	0.8065	\$4,032.50
2	\$5,000	0.6944	\$3,472.00	2	\$5,000	0.6504	\$3,252.00
3	\$6,000	0.5787	\$3,472.20	3	\$6,000	0.5245	\$3,147.00
4	\$6,000	0.4823	\$2,893.80	4	\$6,000	0.4230	\$2,538.00
5	\$7,000	0.4019	\$2,813.30	5	\$7,000	0.3411	\$2,387.70
6	\$7,000	0.3349	\$2,344.30	6	\$7,000	0.2751	\$1,925.70
7	\$7,000	0.2791	\$1,953.70	7	\$7,000	0.2218	\$1,552.60
ΣPV			\$21,115.80	ΣPV			\$18,835.50
I_0			\$20,000.00	I_0			\$20,000.00
NPV			\$1,115.80	NPV			(\$1,164.50)

Step 5: i) IRR at $L_r = L_r + d_r [(PV \text{ at } L_r - I_0) / (NPV \text{ at } L_r - NPV \text{ at } H_r)]$
 $IRR = 20\% + (24\% - 20\%) [(\$21,115.80 - \$20,000) / (\$1,115.80 - (\$1,164.50))]$
 $20\% + 4\% [\$1,115.80 / \$2,280.30]$
 $20\% + 1.9573\%$
 $\approx 21.96\%$

ii) IRR at $H_r = H_r - d_r [(PV \text{ at } H_r - I_0) / (NPV \text{ at } L_r - NPV \text{ at } H_r)]$
 $IRR = 24\% - (24\% - 20\%) [(\$18,835.50 - \$20,000) / (\$1,115.80 - (\$1,164.50))]$
 $24\% - 4\% [\$1,164.50 / \$2,280.30]$
 $24\% - 2.0427\%$
 $\approx 21.96\%$

The IRR for Project B where its NPV = 0 is $\approx 21.96\%$ in both the H_r as well as L_r . The 21.96% is with in the range of the higher and lower rate, i.e., 20% to 24%. Thus, the arithmetic computation is correct.

Opinion:

Accept Project B because its IRR is greater than that of the Project A, i.e., 21.96% > 21.15%.

Note that the three discount models (i.e., NPV, BCR, and IRR) are alternatives. There is no need to apply three of them while appraising the financial feasibility of a project. One of them is sufficient. If the project is acceptable on NPV model; it is also acceptable on the BCR as well as the IRR. Thus, it is advisable to employ the PBP from the non-discount models and any one of the three discount models to appraise feasibility of any commercial project.

Activity 6.3: Appraise and give your expert opinion on the following two projects using (1) BCR, (2) NPV (c) IRR. [Assume that the cost of capital (k^*) is 10%]

		<u>Project A</u>	<u>Project B</u>
Initial Investment (t_0)		\$50,000	\$50,000
Cash Inflows	Year 1	15,000	40,000
	2	5,000	2,000
	3	40,000	8,000
	4	10,000	10,000
	5	10,000	10,000

Financial project appraisal requires projection of cash flow over the life of the project. The cash flow statement with which we are concerned here shows all receipts and expenditures at the time at which they are incurred. We can now look at each aspects of the cash flow statement: **project life, costs and benefits** (Chandra 1993, 1995, 2006; Choudhury, 1988; ICMR, 2007; Joy, 1994; Meredith and Mantel, 2006).

6.3.1: PROJECT LIFE

To determine the life span of the project, the analyst should thoroughly study and bear in mind the four major factors in determining the life of a project. These are: 1) technical life of the major replaceable assets generally machinery. It may be assumed that the project ends when the machinery is worn out, 2) market life of the output or the period for which the benefits will satisfy a need, 3) economic life of the major replaceable assets, and 4) discounted value of net gain.

If the life of the project is determined by the economic life of the main assets, then there must be ways of dealing with other assets whose lives are shorter than those of the main assets, and which must be replaced during the project's life. These are dealt with by showing the cost of the replacement in the cash flow statement as a capital expenditure in the year in which the replacement is made.

If the project's life is determined by discounted value of net gain, it is not customary to extend project beyond 25 years because the further away the year is not only is the greater the degree of uncertainty but also the more insignificant are the value of the amounts involved.

Consideration must be given to what happens to assets that retain value at the end of the project's life. The value of the assets at the end of project life (Salvage value) is included in the cash flow as a benefit in the last year. Theoretically, too, all working capital should be recoverable at the end of project life and also be included in the benefits of the project.

Activity 6.4: State the factors that should be considered in determining the life of a “Cement Factory” with brief explanation.

6.3.2: PROJECT COSTS

A cash flow statement (CFS) embraces both capital and operational costs. Capital costs are the costs of those items needed to set up or establish the project so that it can be operated. Operating costs are those incurred in operating and maintaining the project. The components of these costs will vary from project to project. In general, capital costs usually cover such items as land, buildings (including site preparation and other civil work costs), plant and equipment (comprising acquisition costs, cost of transport, installation and testing, etc), vehicles and working capital. In some cases, a contingency allowance is provided. This is added to the cost of the particular item to which it relates.

Contingency allowances are of two kinds- physical and price contingencies. Physical contingencies refer to two different types of situations: (1) more raw material and/or labour than expected may need to be used due to unforeseen circumstances and (2) where it is foreseen that costs not provided for elsewhere would be incurred but the efforts required to identify the individual cost items is not justified, so a lump sum figure is used instead. Price contingencies (Escalation) are designed to cope with price increases occurring after the project has been appraised, but before it has been established.

Operating costs usually comprise the cost of raw materials, labour, water and fuel, transport, repairs and maintenance. In arriving at the operational costs to be included in the cash flow statement it is customary to calculate in detail raw material, labour, other direct costs and overheads for the maximum level of capacity utilization the plant will attain (usually 100%). Operational costs for the projects life are then based on a fraction or percentage of the rate that the analyst thinks production will achieve.

In preparing cash flow statements, there are several items of cost which some times pose problems. These include **depreciation, depletion, amortization; interest and loan repayments; pre-operating costs; sunk costs; and working capital.**

DEPRECIATION, DEPLETION AND AMORTIZATION

All assets are charged entirely in the year in which they are acquired as initial investment cost. In cash flow statement (CFS), depreciation of fixed assets, depletion of natural resources, and amortization of preoperating costs are not shown because depreciation, depletion and amortization of long term assets are not cash costs.

INTEREST AND LOAN REPAYMENT

Interest and principal for the repayment of loans are not shown in the CFS from the project point of view, but for a different reason than the depreciation, depletion, and amortization. To include interest before arriving at the net cash flow would be double counting because the major purpose of driving the cash flow is to determine the rate of interest the project can bear, interest expense decreases taxable income and the main purpose of employing discounting methods of financial appraisal is to exclude the time value of money (i.e., interest). Thus, the amount of interest ($EBT * T_r$) less tax shield ($I * T_r$) shall be added back to the operating result (i.e., net income/loss) in the CFS, i.e., $I(1-T_r)$. (**Where EBT = Earnings Before Tax; I = Interest; T_r = Tax Rate.**)

In a similar way, to include the repayments of loans would also double counting since it would mean that capital assets were paid for twice, once in the capital costs and then again the figures for loan repayment.

PREOPERATING COSTS

During the establishment phase of a project, before the commencement of operations, it may be necessary to incur expenditure that is not represented by a physical asset such as land or plant and equipment. The most common examples are payment for pre-feasibility and feasibility studies, architects' or surveyors' fees, training cost before production begins, run-test costs, etc. Such costs are known as pre-operating costs and are included as a separate item of capital costs.

SUNK COSTS

The value of the assets already in existence because of the previous project is not the price paid for them when they were originally bought. These costs are irreversibly "sunk", instead their opportunity costs should be used, i.e., the prices which the assets would generate if they are not used in the project and they had to be used for the next best alternative. If they would have been scrapped, then it is the scrap value. If they had no alternative use, their value is zero.

WORKING CAPITAL

Capital costs for such items, as land, buildings, plant and machinery are known as **fixed capital**. Capital costs for stocks, spare parts, and cash requirements, etc, are known as **working capital** or circulating capital. Fixed capital will circulate and remain in the enterprise for a considerable number of years; however working capital will constantly change due to fluctuation in firm's volume of operations and market price for factor inputs.

There can be no set formula for calculating working capital requirements for all projects. Each project has to be looked at by itself, taking account of the relationships between the industries on the one hand and its suppliers and customers on the other.

Activity 6.5: Usually we ignore sunk cost in making future decisions. However, we consider sunk costs in determining a new project's cost. Why? Explain in brief.

6.3.3: PROJECT BENEFITS

The CFS sets out the benefits to be derived from a project. These benefits can take several forms. The easiest to identify are those where all of the output, main products, by-products and residues are sold through normal commercial channels. Benefit valuation is then simply a matter of estimating the sales values of these products.

In some cases, too, projects may lead to improvement in the quality of existing output and reducing costs. When these can be quantified, the better price due to improved quality and the cost savings ought to be included in the cash flow as benefits.

Where the project is not completely new but merely an addition to an existing activity, the entire output of the enterprise cannot be treated as the benefit of the project. Only those increased benefits that accrue because of the implementation of the project should be counted. The same applies, of course, to costs. Where the enterprise exists before the project, then only the extra costs of the project are to be included in the CFS, not the total costs. Thus, the situation necessitates the use of the "**with and with out test**" not the "**before and after test**". Two separate cash flows (one with the new project and one without it) and then the difference will be treated as the benefits and costs of the project.

Activity 6.6: Identify the source of revenue (benefit) for a "Local Tela Project" with a brief justification.

6.4. FINANCIAL ANALYSIS

According to Chandra (1995 & 2006), financial analysis is concerned about the return to the equity capital contributed. We may consider this the financial return to an equity participation in a project. Some times the financial return is termed as "private" return. Thus, financial analysis is applied to determine the financial viability (profitability and wealth maximization) of the project as well as the return to the capital contributed.

The essence of financial analysis is the forecasting of all costs and benefits over the lifetime (project's life) of the project. The analysis is done at prevailing market prices and it is really concerned with the flow of resources involved in the project, cash being merely a convenient way of measuring the flow (Beherens and Hawranck, 1991; Chandra 1995, 2006; Choudhury, 1988; Joy, 1994; Little and Mirrlees, 1974).

6.4.1: SCOPE AND OBJECTIVES OF FINANCIAL ANALYSIS

The purpose of financial analysis is to provide financial information to potential investors, promoters, and financiers to make decision on whether a fund should be invested in the project and how to finance the project. Broadly, the financial analysis should indicate the following: (i) the most viable alternative, (ii) indicate critical alternative, (iii) indicate how funds will be obtained for investment, start up or operation of the project, and (iv) provide information to interested parties involved in the project, the parties could be financiers, community or government, investors, etc.

Therefore, the scope and objectives of financial analysis is to determine, analyse, interpret and communicate all the financial consequences of an investment to users.

6.4.2: CRITERIA FOR INVESTMENT DECISION

How to make an investment decision? We may make investment decision based on the following factors: net return on capital invested, compatibility of project objectives with the overall development objectives, suitability of the strategies (applicability or reliability), availability of resources (inputs), availability of capital, risk involved in the project, etc.

6.4.3: ESTIMATES OF PROJECT COSTS

Following are the three major project costs analysis: **a) capital or investment costs** [these are the cost of establishing a project – i) initial investment (i.e., costs before operation starts), ii) pre-production costs (i.e., other costs not included in (i)), and iii) investment required during production.], **b) production costs**, and **c) operating costs** (administrative and marketing costs).

a. Capital or Investment Costs

i. Initial Investment cost- it includes,

- **Cost of land, site preparations and improvements**
- **Cost of building**
- **Cost of plant, machinery and equipments**

It comprises acquisition costs, freight costs, insurance while in transit, tax to be paid (if any), duties, clearing, storage, installation and testing costs, etc. Acquisition cost determination involves selection of technology, collection of pro forma prices, and lastly making final selection.

- **Cost of vehicles**

Estimation of cost of vehicles can be made in the same way as that of machinery and equipment, except for installation. Furthermore, replacement during operation should be included in the cost estimate.

▪ **Cost of Office Equipment and Furniture**

The analyst involves in the identification of office equipments and furniture based on the organizational structure and cost estimates based on bid approach or rough estimates by experts. Furniture based on bid approach or rough estimates by experts. Furniture includes Tables, chairs, file cabinets, shelves, etc and office equipment includes typewriters, computers, Fax, Telephone, Telegram, etc.

▪ **Working Capital:**

It is the capital costs incurred for raw materials and spare parts, keeping inventories, maintaining receivables, etc.

Activity 6.7: Identify the list of items in initial investment for running a “Mini Restaurant Project” with a brief explanation.

ii. Pre-production Investment

It includes costs before commercial production commences other than those previously discussed in initial investment costs above. These are (a) **preliminary capital issue costs** (company formation costs, public announcement costs, share issue costs, etc.), (b) **project study costs** (pre-feasibility study costs, feasibility study costs, design study costs, etc.), (c) **run-test costs** (supervision costs for start-up operation, remuneration of personnel employed, cost of material consumption, utilities, etc.), and (d) **other costs** (sunk costs, recruitment and training costs, etc.).

iii. Investment during Operation

It includes additional working capital requirement and replacement of assets.

Table 6.8: Investment Cost Schedule (' 000)

	Years (Project Life)										
	0	1	2	3	4	5	6	7	8	9	10
Land related	300	-	-								
Building	3,000	-	-								
Plant Machinery & Equipment	1,000	200	-								
Vehicles	400	-	-			500					
Trucks	800	-	-					200			
Office Equipment and Furniture	300	20	30				40				
Working Capital	500	250	250								
Pre production costs	500	-	-								
Total Investment costs	6,800	470	280	-		500	40		200		

Activity 6.8:

a) Identify the list of items in pre-production investment for running a “Mini Restaurant Project” with a brief explanation.

b) Identify the list of items in investment during operation for running a “Mini Restaurant Project” that is having 15 years project life, with a brief explanation.

Production cost estimate depends on the production program of each period during a lifetime of a project (operation). Production costs are those costs that are incurred to produce a product and make ready for sale. These costs include direct materials, direct labour, and factory overhead. Factory overhead includes factory costs other than the direct materials and direct labour. It is not easy to determine the actual amount of overhead costs. Often, factory overhead is applied to factory cost on the basis of direct labour hours, direct labour costs, or direct labour machine hours. Therefore, the standard unit factory cost shall be computed as follows:

$$\text{Standard Unit Manufacturing Cost} = \text{Standard Unit Direct Material Cost} + \text{Standard Unit Direct Labour Cost} + \text{Applied Unit Overhead Cost}$$

Factory overhead is composed of the **indirect production costs other than direct materials and direct labour**, such as factory depreciation and depletion; factory utilities, maintenance, supplies, and rent; and factory indirect labour costs, such as the salary of a guard, janitor and messenger, etc, and **the operating costs** (administrative and marketing costs) **applicable to the production**. For example, the firm top management salary; organization might have a common utility; guards, janitors, messengers, insurance, rent, transportation service costs; costs related to the administrative and marketing departments' support services given to the production department, etc.

Total Production Cost Schedule

Total cost of production is a summation of direct material cost, direct labor cost, and the applied FOH costs. Total cost of production should take into account the production program in each year, thus it should be calculated for each year (for each production program).

Table 6.9: Total Production Cost Schedule ('000)

	Years (Project life)									
	1	2	3	4	5	6	7	8	9	10
Production Capacity	50%	75%	100%	100%	100%	100%	100%	100%	100%	100%
Production Volume ('000)	100	150	200	200	200	200	200	200	200	200
Factory Costs (\$1.70/Unit):										
Direct Material (\$1.0/Unit)	100	150	200	200	200	200	200	200	200	200
Direct Labour (\$0.5/Unit)	50	75	100	100	100	100	100	100	100	100
Applied FOH (\$0.2/Unit)	20	30	40	40	40	40	40	40	40	40
Total Production Costs (\$)	170	255	335	340	340	340	340	340	340	340

Depreciation and Amortization Costs

An independent depreciation, depletion and amortization costs shall be computed; and an independent and consolidated schedule shall be prepared for the production, administration and marketing departments. Such individual computation and schedule facilitates the preparation of project income and cash flow statement.

Table 6.10: Depreciation and Amortization Schedule- Production Department

	Years (Project life) ('000)									
	1	2	3	4	5	6	7	8	9	10
Plant Building	100	100	100	100	100	100	100	100	100	100
Plant Machinery & Equipment	50	50	50	50	50	50	50	50	50	50
Vehicles	10	10	10	10	10	10	10	10	10	10
Office Equipment & Furniture	5	5	5	5	5	5	5	5	5	5
Pre production cost	2	2	2	2	2	2	2	2	2	2
Total Depreciation & Amortization	167	167	167	167	167	167	167	167	167	167

* Depletion of natural resources can be computed based on a unit-of-production method and included in the above schedule, if any.

Table 6.11: Depreciation and Amortization Schedule- Administration Department

	Years (Project life) ('000)									
	1	2	3	4	5	6	7	8	9	10
Office Building	85	85	85	85	85	85	85	85	85	85
Office Equipment & Furniture	35	35	35	35	35	35	35	35	35	35
Vehicles	7	7	7	7	7	7	7	7	7	7
Total Depreciation	127	127	127	127	127	127	127	127	127	127

Table 6.12: Depreciation and Amortization Schedule- Marketing Department

	Years (Project life) ('000)									
	1	2	3	4	5	6	7	8	9	10
Office Building	60	60	60	60	60	60	60	60	60	60
Warehouse	35	35	35	35	35	35	35	35	35	35
Office Equipment & Furniture	25	25	25	25	25	25	25	25	25	25
Vehicles	5	5	5	5	5	5	5	5	5	5
Trucks	5	5	5	5	5	5	5	5	5	5
Total Depreciation	130	130	130	130	130	130	130	130	130	130

Table 6.13: Consolidated Depreciation and Amortization Schedule

	Years (Project life) ('000)									
	1	2	3	4	5	6	7	8	9	10
Production Depreciation & Amortization	167	167	167	167	167	167	167	167	167	167
Administration Depreciation & Amortization	127	127	127	127	127	127	127	127	127	127
Marketing Depreciation & Amortization	130	130	130	130	130	130	130	130	130	130
Total Depreciation & Amortization	424	424	424	424	424	424	424	424	424	424

c. Administration Costs

Administrative costs are costs incurred for general administration of a company. These costs include:

- Wages and salaries of non-production and non-marketing personnel.
- Office supplies and utilities
- Depreciations and amortizations
- Financial costs
- Rents, property insurance, property taxes, etc.

Financial costs are interest payments on loans or credits. Most feasibility studies show a declining amount of financial costs because the loans would be repaid and the interest on the unpaid balance declines.

$$\text{Annual Instalment Payment} = \frac{\text{Total Loan Amount}}{\text{Present value of Annuity}} \quad (\text{Interest plus principal})$$

Given:

Loan = \$8,000, n = 5 years, I = 10%; therefore, present value of annuity at n = 5 and I = 10% is 3.7908. Then, annual installment will be:

$$\frac{\$8,000}{3.7908} = \$2,110.3724$$

Table 6.14: Loan Amortization Schedule

Year	Beginning Balance	Payment = \$2,110.3724		Ending Balance
		Principal	Interest	
1	8,000.0000	1,310.3724	800.0000	6,689.2760
2	6,689.2760	1,441.4448	668.9276	5,247.8312
3	5,247.8312	1,585.5893	524.78312	3,662.2419
4	3,662.2419	1,744.1483	366.22419	1,918.0936
5	1,918.0936	1,918.5631	191.80936	-----

Table 6.15: Administration Cost Schedule

	Years (Project life) ('000)									
	1	2	3	4	5	6	7	8	9	10
Wages and salaries	500	500	500	500	500	500	500	500	500	500
Office Supplies	300	300	300	300	300	300	300	300	300	300
Office Utilities	200	200	200	200	200	200	200	200	200	200
Office Rents	100	100	100	100	100	100	100	100	100	100
Property Insurance	50	50	50	50	50	50	50	50	50	50
Property Taxes	10	10	10	10	10	10	10	10	10	10
Financial Costs (Interest)	0.8	0.669	0.525	0.366	0.192	-	-	-	-	-
Depreciation & Amortization	127	127	127	127	127	127	127	127	127	127
Total Administration Costs	1,287.8	1,287.7	1,287.5	1,287.4	1,287.2	1,287	1,287	1,287	1,287	1,287

d. Marketing Costs

Marketing costs refer to the cost of marketing activities. These include:

- Packaging, storage, sales salary, commission, cash discount, sales return and allowance, promotion and advertisement, transport insurance, distribution cost, marketing supplies, market research, etc.
- Depreciation of fixed assets such as storage house and delivery truck.

Table 6.16: Marketing Cost Schedule

	Years (Project life) ('000)									
	1	2	3	4	5	6	7	8	9	10
Wages and salaries	800	800	800	800	800	800	800	800	800	800
Marketing Supplies	300	300	300	300	300	300	300	300	300	300
Marketing Utilities	200	200	200	200	200	200	200	200	200	200
Packaging	100	100	100	100	100	100	100	100	100	100
Distribution Costs	200	200	200	200	200	200	200	200	200	200
Marketing Research	100	100	100	100	100	100	100	100	100	100
Promotion and Advertisement	10	10	10	10	10	10	10	10	10	10
Cash discounts	2	2	2	2	2	2	2	2	2	2
Sales Commission	3	3	3	3	3	3	3	3	3	3
Depreciation & Amortization	130	130	130	130	130	130	130	130	130	130
Total Marketing Costs	1,845	1,845	1,845	1,845	1,845	1,845	1,845	1,845	1,845	1,845

e. Recovery of Fixed Assets and Working Capital

Recovery of fixed assets refers to the recovery of the salvage value of fixed assets at the time of replacement and at the end of project life. Besides, recovery of working capital refers to the amount of working capital to be recovered during operation due to operational down sizing and/or at the end of project life.

Table 6.17: Recovery of Fixed Assets and Working Capital Schedule

	Years (Project life) ('000)									
	1	2	3	4	5	6	7	8	9	10
Recovery of Fixed Assets										
Recovery of Working Capital										
Total Recovery of Fixed Assets and Working Capital										

6.4.4: ESTIMATES OF PROJECT BENEFITS

Project benefits are those benefits that can be generated from the project's normal operation (sales of main products) as well as auxiliary operations such as revenue from sales of by-products, revenue from disposables, fees income from consultancy services, interest from short term investment, rent income from leasing idle fiscal capacity, commissions from cooperative promotions, etc.

Project benefits are estimated by determining the unit selling price and forecasting of the volume of sales from main as well as the by-products and by estimating the auxiliary sources of incomes.

A separate revenue schedule for the project benefits from sales of main products, by-products and auxiliary sources of income along with a consolidated schedule shall be prepared as follows:

Table 6.18: Consolidated Project Benefit Schedule

	Years (Project life) ('000)									
	1	2	3	4	5	6	7	8	9	10
Revenue from Sales of Main Products (Schedule a)										
Volume of Sales	1,000	1,500	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Unit Selling Price	10	10	10	10	10	10	10	10	10	10
Total Sales	10,000	15,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Revenue from Sales of By-Products (Schedule b)										
Volume of Sales	100	150	200	200	200	200	200	200	200	200
Unit Selling Price	2	2	2	2	2	2	2	2	2	2
Total Sales	200	300	400	400	400	400	400	400	400	400
Income from Auxiliary Operations (Schedule c)										
Commission Income	500	500	500	500	500	500	500	500	500	500
Rent Income	400	400	400	400	400	400	400	400	400	400
Fees Earning	300	300	300	300	300	300	300	300	300	300
Interest Earning	100	100	100	100	100	100	100	100	100	100
Others	50	50	50	50	50	50	50	50	50	50
Total Auxiliary Income	1,350	1,350	1,350	1,350	1,350	1,350	1,350	1,350	1,350	1,350
Total Project Benefits (a+b+c)	11,550	16,650	31,750	31,750	31,750	31,750	31,750	31,750	31,750	31,750

6.4.5: ANALYSIS OF PROJECT CASH FLOWS

The cash flow refers to the project's future cash inflows, outflows and the net cash flow. Thus, the following procedures shall be followed to prepare cash flow statement:

- i. **Prepare a single-step income statement** from the consolidated schedules for project benefits, production costs, administration costs and marketing costs, and apply the profit tax rate on the **Earnings Before Tax** (i.e., project benefits less production, administration and marketing costs)

Table 6.19: Project Income Statement Schedule ('000)

	Years (Project life)									
	1	2	3	4	5	6	7	8	9	10
Total Project Benefits (Table 6.18)										
Less Project Costs:										
Production Costs (Table 6.9)										
Administration Costs (Table 6.15)										
Marketing Costs (Table 6.16)										
Total Project Costs										
Earning Before Tax										
Profit Tax (%)										
Net Income/Loss										

- ii. **Prepare cash flow statement:**

- a) **Compute cash flow from operation.** It is described as net income or net loss plus non-cash expenses (i.e., depreciation, depletion and amortization) and interest expense [i.e., $I(1-T_r)$], due to the tax shield (i.e., $I * T_r$). Where I = Amount of Interest, T_r = Tax Rate.
- b) **Compute recovery of working capital and fixed assets.** It is described as the working capital plus salvage/book value of fixed assets.

Working capital is a circulating capital until the project cease operation. However, there might be withdrawal of working capital from operation during the project life due to reduction in project operations, such as closing a branch, abandoning a product line, etc. So it must be recovered and listed as benefit during and at the end of the project's life. Besides, **salvage value** of old fixed assets on replacement during the project life and **book value** of fixed assets at the end of the project life are considered as the sales value of fixed assets. Thus, the salvage/book value must be recovered and listed as benefits during and at the end of the project's life.

- c) **Compute total cash inflows during the project's life.**
- d) **Compute net cash flow (i.e., total cash inflow less total cash outflow) during the project's life.**

Table 6.20: Project Cash flow Statement Schedule ('000)

	Years (Project Life)										
	0	1	2	3	4	5	6	7	8	9	10
Cash Flow from Operation:											
Net Income/Loss (Table 6.18)											
Add: Depreciation and Amortization (Table 6.13)											
Add: Interest [$I(1-T_r)$] [Table 6.14]											
Cash Flow from Operation											
Add: Recovery of Working Capital [Table 6.17]											
Add: Recovery of Fixed Assets [Table 6.17]											
Total Cash In flows	-	1,000	1,000	1,000	900	1,300	1,200	1,200	1,200	1,300	2,000
Less: Total Cash Out Flows [Table 6.8]	(6,800)	(470)	(280)	-	-	(500)	(40)	-	200	-	-
Net Cash In Flows (NCI)	(6,800)	530	720	1,000	900	800	1,160	1,200	1,000	1,300	2,000

$\Sigma NCI = \$3,810.$

- e) **Analyze financial feasibility by applying the Pay Back Period and any of the discounting techniques (NPV, BCR, or IRR) and state decision opinions on accepting or rejecting the project.**

The net cash inflow for the project is \$3,810. Therefore, by selecting and applying proper project decision criteria, the project has to be appraised. For example, when its pay back period is lower than the cut-off pay back period, when it has positive net present value, and when its internal rate of return (IRR) is greater than the required rate of return (cost of capital), the decision maker may decide to accept the project.

Activity 6.9: Determine the cost elements that should be accounted in determining the unit manufacturing cost of a “Local Tela” with brief explanation.

6.5: CHAPTER SUMMARY

The primary objective of any project is to earn reasonable returns for the investment made. The project manager must examine the financial feasibility of projects when selecting a project for implementation. In this process, the project manager determines the project life, estimates the total cost of the project, forecast the future benefits and then identifies the various means for financing the project. Share capital, term loans, debenture capital, deferred credit are some of the means for financing a project. Then the project manager identifies the working capital needs of the project and the means for financing the needs.

The project manager uses two criteria to evaluate rate of returns of project investments: non-discounting and discounting criteria. The time value of money is ignored in non-discounting criteria, but is considered in discounting criteria. The important methods in the non-discounting criteria are the Dominance, Average Rate of Return, Payback Period and urgency method.

The time value of money is considered in the discounting criteria and the Net Present Value, Internal Rate of Return and Profitability Index (or the Benefit-Cost Ratio) are the important methods.

The right project should be selected before resources are allocated. After careful financial analysis, the project manager selects a project from the various alternatives in hand. The project manager considers a selection criterion that better meets the objectives and interests of the organization. The project selection model should be realistic, capable, cost effective, flexible, easy to use and easily computerized

6.6: CHAPTER END EXERCISES AND SOLUTIONS

You are advised to attempt the following three exercises before looking at the provided solutions.

EXERCISE NO. 1: New Product Development- A Case Study on Financial Analysis

Graph-O- Tron Inc. has acquired the patent rights for a new, very fast vector cathode-ray tube computer terminal. The terminal is very attractive to organizations, such as utilities, highway departments, and land-use planning organizations that use geography and geographic locations in their management information systems.

Graph-O- Tron is operating near capacity and would require new production facilities to produce the new terminal. The cost of the plant and other facilities would be \$6.2 million. The expected useful life is eight years, with an estimated salvage value of \$1.4 million.

Expected unit variable costs are estimated as follows:

Direct material	\$280
Direct labour	270
Variable overhead	30
Variable selling & administrative costs	<u>120</u>
Variable cost per unit	700

The product is expected to have an eight-year life cycle after which it will be technologically obsolete. At a selling price of \$1400 per unit, expected sales for the eight-year period are:

Year	Expected Sales (In units)	Year	Expected Sales (In units)
1	2000	5	4000
2	4000	6	3000
3	5000	7	2000
4	5000	8	2000

Heavy advertising and promotional costs are required to penetrate the market quickly before competition reacts to the new product. During the first two years of the product's life, such costs would be \$ 300,000 a year and they would decrease to \$100,000 per year for the last six years. The net working capital requirement of the project is estimated at \$350,000.

Other fixed costs, including depreciation, would amount to \$800,000 a year. The firm's average income tax rate is 40 percent.

Graph-O-Tron requires a 25% return on investment for a product that is as risky as the new terminal.

Required:

- Using the Net Present Value (NPV) method, evaluate the investment project.
- If the firm uses its normal required rate of return of 16% instead of the 25% rate of risky projects, would the project be acceptable under NPV?
- Compute the Internal Rate of Return (IRR) of the investment project. (Hint: Total Investment Costs at year 0):

Fixed Investment	\$6,200,000
Working Capital	<u>350,000</u>
Total	<u>\$6,550,000</u>

SOLUTION FOR EXERCISE NO. 1: Using the net present value method, evaluate the investment project.

Income Statement & Cash Flow Statement

Income Statement									
Year	0	1	2	3	4	5	6	7	8
Sales		2,800,000	5,600,000	7,000,000	7,000,000	5,600,000	4,200,000	2,800,000	2,800,000
Production costs:									
Variable cost		1,400,000	2,800,000	3,500,000	3,500,000	2,800,000	2,100,000	1,400,000	1,400,000
Fixed costs (including Depreciation)		800,000	800,000	800,000	800,000	800,000	800,000	800,000	800,000
Marketing costs (Adver. & promot. Costs)		300,000	300,000	100,000	100,000	100,000	1,000,000	100,000	100,000
Total operating costs		2,500,000	3,900,000	4,400,000	4,400,000	3,700,000	3,000,000	2,300,000	2,300,000
Operating Income (loss)		300,000	1,700,000	2,600,000	2,600,000	1,900,000	1,200,000	500,000	500,000
Income Tax (40%)		120,000	680,000	1,040,000	1,040,000	760,000	480,000	200,000	200,000
Net Income		180,000	1,020,000	1,560,000	1,560,000	1,140,000	720,000	300,000	300,000

Cash Flow Statement									
	0	1	2	3	4	5	6	7	8
Income from operation (net income)		180,000	1,020,000	1,560,000	1,560,000	1,140,000	720,000	300,000	300,000
Add: Depreciation (\$4,800,000 / 8)		600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000
Total cash inflow from operation		780,000	1,620,000	2,160,000	2,160,000	1,740,000	1,320,000	900,000	900,000
Add: Recovery of salvage value									1,400,000
Recovery of Working capital									350,000
Total cash inflows		780,000	1,620,000	2,160,000	2,160,000	1,740,000	1,320,000	900,000	2,650,000
Less: Cash outflows	-6,550,000								
Net cash inflows	-6,550,000	780,000	1,620,000	2,160,000	2,160,000	1,740,000	1,320,000	900,000	2,650,000

Net Present Value (NPV) of Net Cash Inflows (NCI)									
	0	1	2	3	4	5	6	7	8
Net Cash Inflows	-6,550,000	780,000	1,620,000	2,160,000	2,160,000	1,740,000	1,320,000	900,000	2,650,000
PV of \$1, r = 25%, n = 8	1	0.8	0.64	0.512	0.4096	0.3277	0.2621	0.2097	0.1678
Present value of Net cash inflow at 25%, n = 8	-6,550,000	624,000	1,036,800	1,105,920	884,736	570,198	345,972	188,730	444,670
PV of \$1, r = 16%, n = 8	1	0.862	0.743	0.641	0.552	0.476	0.41	0.354	0.305
Present value of Net cash inflow at 16%, n = 8	-6,550,000	672,360	1,203,660	1,384,560	1,192,320	828,240	541,200	318,600	808,250

a) Net Present Value at 25%, n = 8 => \$5,201,026 - \$6,550,000 = (\$1,348,974) = Reject the project.

b) Net Present value at 16%, n = 8 => \$6,949,190 - \$6,550,000 = \$399,190 = Accept the project.

c) Internal Rate of Return => 18.05%.

Decision: Accept the project because the IRR is greater than the 16% RRR.

EXERCISE NO. 2

Aster, a well-known entrepreneur in Addis Ababa, wants to establish a Pasta Factory. The required **investment costs** are as follows:

- a) **Land**
She expects to pay a lease fee of 500,000 Birr. It is amortized over 10 years (Assume the lease period is 10 years).
- b) **Building**
The total cost of site preparation is 200,000 Birr. She is going to have a factory building on 1,000M². She will have another building for offices on 200M². Each M² of building costs 1,000 Birr. It will have a salvage value of 500,000 Birr at the end of 10th year.
- c) **Machinery and Equipment**
She will import the machinery from Germany. The CIF price of the machine at Djibouti is 2 million. She expects to pay inland transport of 2,000 Birr and customs duty of 50,000 Birr. The salvage value of the machine at the end of 10th year is 100,000 Birr.
- d) **Vehicles**
The total cost of the vehicle is 300,000 Birr and it is to be replaced for the same cost at the end of 5th year. The salvage value in each case is 50,000 Birr.
- e) **Office Furniture and Equipment**
The total cost is estimated to be 100,000 Birr with no salvage value at the end of 10th year.
- f) **Working Capital**
The working capital requirement at full capacity is 1,000,000 Birr. The factory operates 50% and 75% in the first year and second year respectively. It operates at full capacity from the third year onwards.
- g) **Pre-Operating Costs**
The factory incurs pre operating costs of 500,000 Birr before it starts operation (run test, studies, training, etc). The cost is amortized over 10 years on straight-line basis.

Operating Activities

The factory's out put sales is 10,000,000 Birr per year at full capacity. Operating cash cost, excluding depreciation, is 6,000,000 Birr (variable cost) at full capacity. Depreciation is calculated based on straight-line method. The existing tax rate of 35% is expected to continue.

Interest Cost

Aster plans to borrow 3,000,000 Birr at annual interest rate of 10%, payable in annual equal instalment over 10 years.

Required

- a) Prepare,
 - 1) Total investment cost schedule
 - 2) Depreciation and amortization schedule
 - 3) Loan amortization schedule
 - 4) Total production cost schedule
 - 5) Income Statement schedule
 - 6) Cash Flow Statement schedule
- b) Evaluate the project by using NPV method at 15% discount rate and IRR.

SOLUTION FOR EXERCISE NO. 2

(a) (1) TOTAL INVESTMENT COST SCHEDULE					
Year	1	2	3	4	5
Cost Items					
Land	500,000				
Building (including site preparation)	1,400,000				
Machinery and Equipment	2,052,000				
Vehicles	300,000				300,000
Office Furniture and Equipment	100,000				
Working Capital	500,000	250,000	250,000		
Preproduction costs	500,000				
Total investment costs	5,352,000	250,000	250,000		300,000

Note: Initial investment at the beginning of year 1 (i.e., year 0) is= \$5,352,000;
No additional investment in year six then after.

(2) (i) Depreciation and Amortization Schedule					
Year	1	2	3	4	5
Items					
Land (500,000/10 = 50,000/year)	50,000	50,000	50,000	50,000	50,000
Building [(1,400,000 - 500,000)/10 = 90,000/year]	90,000	90,000	90,000	90,000	90,000
Mach. & Equipment. [(2,052,000-100,000)/10=195,200/Yr]	195,200	195,200	195,200	195,200	195,200
Vehicles [(300,000 - 50,000)/5= 50,000/Yr]	50,000	50,000	50,000	50,000	50,000
Office Furniture & Equipment (100,000/10 = 10,000/Yr)	10,000	10,000	10,000	10,000	10,000
Preproduction costs (500,000/10 = 50,000/Yr)	50,000	50,000	50,000	50,000	50,000
Total Depreciation & Amortization	445,200	445,200	445,200	445,200	445,200

Continued ...

Year	6	7	8	9	10
Items					
Land (500,000/10 = 50,000/year)	50,000	50,000	50,000	50,000	50,000
Building [(1,400,000 - 500,000)/10 = 90,000/year]	90,000	90,000	90,000	90,000	90,000
Mach. & Equipment. [(2,052,000-100,000)/10=195,200/Yr]	195,200	195,200	195,200	195,200	195,200
Vehicles [(300,000 - 50,000)/5= 50,000/Yr]	50,000	50,000	50,000	50,000	50,000
Office Furniture & Equipment (100,000/10 = 10,000/Yr)	10,000	10,000	10,000	10,000	10,000
Preproduction costs (500,000/10 = 50,000/Yr)	50,000	50,000	50,000	50,000	50,000
Total Depreciation & Amortization	445,200	445,200	445,200	445,200	445,200

(ii) Recovery of Salvage Value and Working Capital Schedule					
Year	1-4Yrs	5	6-9 Yrs	10	
Items					
Building				500,000	
Machinery and Equipment				100,000	
Vehicles		50,000		50,000	
Recovery of Working capital				1,000,000	
Total Salvage value and working capital recovered		50,000		1,650,000	

(3) Loan Amortization Schedule				
Year	Beginning Balance	Annual Instalment Payment = \$488,201.79		Ending Balance
		Principal	Interest	
1	3,000,000	188,201.79	300,000	2,811,798.20
2	2,811,798.20	207,021.97	281,179.82	2,604,776.20
3	2,604,776.20	227,724.17	260,477.62	2,377,052
4	2,377,052.00	250,496.59	237,705.20	2,126,555.40
5	2,126,555.40	275,546.25	212,655.54	1,851,009.20
6	1,851,009.20	303,100.87	185,100.92	1,547,908.30
7	1,547,908.30	333,410.96	154,790.83	1,214,497.30
8	1,214,497.30	366,752.06	121,449.73	847,745.24
9	847,745.24	403,427.27	84,774.524	444,317.97
10	444,317.97	443,769.99	44,431.797	547.9774*

The \$547.9774 difference is due to round offs.

Loan = \$3,000,000

Loan period = 10 years, annual instalment payment

Interest = 10%

Annual Instalment Payment = $\frac{\text{Loan}}{\text{PVIFA (10\%, 10yrs)}}$

$= \frac{\$3,000,000}{6.145}$

$= \underline{\$488,201.79}$

Note:

Annual Interest Payment = Unpaid Principal * 10%

Principal Payment = Instalment Payment (i.e., \$488, 201.79) - Annual Interest Payment

(4) Total Production Cost Schedule						
Year	1	2	3	4	5	6
Operating cash costs (V)	3,000,000	4,500,000	6,000,000	6,000,000	6,000,000	6,000,000
Depreciation and Amortization (F)	445,200	445,200	445,200	445,200	445,200	445,200
Financial cost (F) (i.e., interest)	300,000	281,179.8 2	260,477.6 2	237,705.2 0	212,655.5 4	185,100.9 2
Total Production costs:	3,745,200	5,226,380	6,705,678	6,682,905	6,657,856	6,630,301
The total is rounded off to the nearest whole number.						

Continued ...

Year	7	8	9	10
Operating cash costs (V)	6,000,000	6,000,000	6,000,000	6,000,000
Depreciation and Amortization (F)	445,200	445,200	445,200	445,200
Financial cost (F) (i.e., interest)	154,790.8 3	121,449.7 3	84,774.52	44,431.80
Total Production costs:	6,599,991	6,566,650	6,529,975	6,489,632
The total is rounded off to the nearest whole number.				

(5) Income Statement and (6) Cash Flow Statement						
Year	0	1	2	3	4	5
Capacity:	0	50%	75%	100%	100%	100%
Revenues	0	5,000,000	7,500,000	10,000,000	10,000,000	10,000,000
Production cost	0	3,745,200	5,226,380	6,705,678	6,682,905	6,657,856
Operating Income (loss)	0	1,254,800	2,273,620	3,294,322	3,317,095	3,342,144
Income Tax (35%)	0	439,180	795,767	1,153,013	1,160,983	1,169,750
(5) Net Income (loss)	0	815,620	1,477,853	2,141,309	2,156,112	2,172,394
(6) Add: Depreciation & Amortization	0	445,200	445,200	445,200	445,200	445,200
Financial Cost: $[I(1-TR)^n]$, i.e., $I(1-0.35)$	0	195,000	182,767	169,311	154,508	138,226
Cash flow from operation	0	1,455,820	2,105,820	2,755,820	2,755,820	2,755,820
Add: Recovery of working capital	0					
Recovery of Salvage value	0					50,000
Total cash inflow from project	0	1,455,820	2,105,820	2,755,820	2,755,820	2,805,820
Less: Total cash outflow (Investment Cost)	[5,352,000]	250,000	250,000			300,000
(6) Net Cash Inflow	[5,352,000]	1,205,820	1,855,820	2,755,820	2,755,820	2,505,820
Present value of \$1, at 15%, n=10	1	0.87	0.756	0.658	0.572	0.497
Present value of net cash flow at 15%	[5,352,000]	1,049,063	1,403,000	1,813,330	1,576,329	1,245,393
Present value of \$1, at 40%, n=10	1	0.714	0.51	0.364	0.26	0.186
Present value of net cash flow at 40%	[5,352,000]	749,031	715,530	660,052	409,846	231,643

* Where, I = Annual Interest Payment; TR = Tax Rate (i.e., 35%)

Continued ...

Year	6	7	8	9	10
Capacity:	100%	100%	100%	100%	100%
Revenues	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
Production cost	6,630,301	6,599,991	6,566,650	6,529,975	6,489,632
Operating Income (loss)	3,369,699	3,400,009	3,433,350	3,470,025	3,510,368
Income Tax (35%)	1,179,395	1,190,003	1,201,673	1,214,509	1,228,629
(5) Net Income (loss)	2,190,304	2,210,006	2,231,677	2,255,516	2,281,739
(6) Add: Depreciation & Amortization	445,200	445,200	445,200	445,200	445,200
Financial Cost: $[I(1-TR)^n]$, i.e., $I(1-0.35)$	120,316	100,614	78,943	55,104	28,881
Cash flow from operation	2,755,820	2,755,820	2,755,820	2,755,820	2,755,820
Add: Recovery of working capital					1,000,000
Recovery of Salvage value					650,000
Total cash inflow from project	2,755,820	2,755,820	2,755,820	2,755,820	4,405,820
Less: Total cash outflow (Investment Cost)					
(6) Net Cash Inflow	2,755,820	2,755,820	2,755,820	2,755,820	4,405,820
Present value of \$1, at 15%, n=10	0.432	0.376	0.327	0.284	0.247
Present value of net cash flow at 15%	1,190,514	1,036,188	901,153	782,653	1,088,238
Present value of \$1, at 40%, n=10	0.133	0.095	0.068	0.048	0.035
Present value of net cash flow at 40%	158,338	98,438	61,278	37,567	38,088

Net Present Value (NPV)

Total present value of cash inflow at 15% = 12,085,861 Br

Less: Total present value of cash outflow at year 0 = \$ 5,352,000 Br = \$6,733,861 Br (NPV)

NPV at 40% is \$3,159,811 - \$5,352,000 = (\$2,192,188)

Decision: Accept the project because the NPV is positive.

IRR = 33.86%

Decision: Accept the project because the IRR (33.86%) is greater than the RRR (15%).

EXERCISE NO. 3

Wakjara, the well-known entrepreneur in Borena, has recently conceived a project idea, i.e., to establish “Meat Processing Factory” in Borena. It is to be named “**Warsha Fony Wakjara**”.

Since Wakjara is already a resident in Borena, he had acquired a piece of land that serves the purpose. The land on which the factory is to be established is sloppy; it requires a lot of effort to prepare it suitably. The site preparation cost is estimated to be 10,000 Birr. Building construction and civil works are to be given to a contractor. A civil engineer in charge of the feasibility study estimated the cost of Building and Civil works to be 2,000,000 Br. The design study, however, costs 5,000 Br. [**Building & Civil work = 10,000 + 2,000,000 + 5,000 = 2,015,000**].

The technology that is used for meat processing has been selected from three main alternatives. The machinery and equipment alternative sources were Italy, Germany, and the Netherlands. The one from Germany was selected as suitable technology. The cost, including installation, is 5,000,000 Br. Initial spare parts that were to be purchased together with the new machinery cost 100,000 Br. the machinery can serve economically for 15 years. [**Machinery and Equipment = 5,000,000 + 100,000 = 5,100,000 Birr**]

The output is mainly exported to Saudi Arabia. For this purpose, two trucks have to be bought for 700,000 Br. In addition, small vehicles that serve for different transportation activities are to be purchased for 300,000 Br. The life spans for the two trucks are 8 years and the vehicles are only 5 years each.

Office furniture and equipment cost determination was difficult to estimate accurately. Accordingly, an expert was approached. He suggested that 120,000 Br. should be invested initially and 80,000 Br. to be added at the end of the 3rd year of operation.

The working capital that is required to operate at full capacity was estimated as follows:

Cash	80,000 Br	} Total Working Capital = 3,200,000 Br.
A/Receivable	700,000 Br	
Inventories:		
Live stock	1,000,000 Br	
Work in Process	100,000 Br	
Finished Goods	800,000 Br	
Others	520,000 Br	

The factory is expected to operate at 50% in the first year, 75% in the 2nd year, and at full capacity 3rd year on wards.

The waste and residuals will flow to areas by river unless ways and means are founded to solve the problems. Engineers suggest water well has to be done and sewerages have to be refined before it flows to the river. The well and device to treat the waste costs 100,000 Br.

Some employees have to be recruited and trained before operation starts. The cost of recruiting, salary and training is 95,000 Br. In order to test the machinery, additional cost of material and labour is equal to 20,000 Br. Other study costs in relation to the project are 80,000 Br.

a) **Pre Production Cost:**

Water Well & Sewerage = 100,000 Br.

Recruitment, Training & Salary = 95,000 “

Run-Test cost = 20,000 “

Study cost = 80,000 ”

Total **295,000 Br.**

b) **Production costs** at full capacity annually:

Material (V) = 6,000,000 Br.

Labor (V) = 1,200,000 Br.

FOH (Fixed) = 2,000,000 Br.

c) **Administrative costs** (all fixed):

Wages and Salaries = 1,000,000 Br

Office supplies = 100,000 Br.

Utilities = 500,000 Br.

Insurance = 200,000 Br.

Others = 200,000 Br.

Total **2,000,000 Br.**

d) **Depreciation** is calculated based on straight-line method. The following salvage values are proposed:

Building = 500,000 Br. end of the 15th year

Machinery = 500,000 Br. " " " "

Vehicles = Truck = 140,000 Br end of its own life span (8 years)

Other = 60,000 Br. end of 5th years

Office furniture = 5,000 Birr. The one bought for 80,000 Br. has 12 years life and has no salvage value. The one bought for 120,000 Br. has life span of 15 years.

All other fixed investment costs are utilized over the 15 years based on straight-line basis.

e) **Financial Cost (Interest):**

The factory will borrow from a bank 3,500,000 Br. at 10% to be paid on equal installment basis over 10 years.

The project is expected to generate total revenue of 20,000,000 Br. per a year at full capacity. It is also expected to pay marketing costs of 2,000,000 Br. per a year of which 1,200,000 is variable cost at full capacity.

Required:

a) Prepare,

- 1) Total investment cost schedule
- 2) Depreciation and amortization schedule
- 3) Loan amortization schedule
- 4) Total production cost schedule
- 5) Income Statement
- 6) Cash Flow Table

b) Evaluate the project using NPV method at 15% discount rate and IRR.

SOLUTION FOR EXE.3: a) (1) Investment Cost Schedule									
Year	0	1	2	3	4	5	6	7	8
Building & Civil Works	2,015,000								
Machinery & Equipment	5,100,000								
Trucks	700,000								700,000
Vehicles	300,000					300,000			
Office Furniture & Equip.	120,000			80,000					
Working Capital	1,600,000	800,000	800,000						
Pre Production Costs	295,000								
Total Investment Cost	10,130,000	800,000	800,000	80,000		300,000			700,000

Continued ...

Year	9	10	11	12	13	14	15		
Building & Civil Works									
Machinery & Equipment									
Trucks									
Vehicles		300,000							
Office Furniture & Equip.									
Working Capital									
Pre Production Costs									
Total Investment Cost		300,000							

2) (i) Depreciation and Amortization Schedule								
Year	1	2	3	4	5	6	7	8
Building & civil works [2,015,000 - 500,000]/15	101,000	101,000	101,000	101,000	101,000	101,000	101,000	101,000
Mach. & Equipment [5,100,000 - 500,000]/15	306,667	306,667	306,667	306,667	306,667	306,667	306,667	306,667
Trucks [700,000 - 140,000]/8	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000
Vehicles [300,000 - 60,000]/5	48,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000
Office Furniture & Equip [120,000 - 5,000]/15	7,667	7,667	7,667	14,334	14,334	14,334	14,334	14,334
Pre Production Costs	19,667	19,667	19,667	19,667	19,667	19,667	19,667	19,667
Total	553,001	553,001	553,001	559,668	559,668	559,668	559,668	559,668

NB: The Office Furniture & Equipment acquired at the end of year 3 is assumed to be depreciated over the 12 years with no salvage value.

Continued ...

Year	9	10	11	12	13	14	15
Building & civil works [2,015,000 - 500,000]/15	101,000	101,000	101,000	101,000	101,000	101,000	101,000
Mach. & Equipment [5,100,000 - 500,000]/15	306,667	306,667	306,667	306,667	306,667	306,667	306,667
Trucks [700,000 - 140,000]/8	70,000	70,000	70,000	70,000	70,000	70,000	70,000
Vehicles [300,000 - 60,000]/5	48,000	48,000	48,000	48,000	48,000	48,000	48,000
Office Furniture & Equip [120,000 - 5,000]/15	14,334	14,334	14,334	14,334	14,334	14,334	14,334
Pre Production Costs	19,667	19,667	19,667	19,667	19,667	19,667	19,667
Total	559,668	559,668	559,668	559,668	559,668	559,668	559,668

NB: The Office Furniture & Equipment acquired at the end of year 3 is assumed to be depreciated over the 12 years with no salvage value.

ii) Recovery of Fixed Assets and Working Capital Schedule									
Year	1	2	3	4	5	6	7	8	9
Building & Civil Works									
Machinery & Equipment									
Trucks								140,000	
Vehicles					60,000				
Office Furniture & Equip.									
Working Capital									
Total Recovery					60,000			140,000	

Continued ...

Year	10	11	12	13	14	15
Building & Civil Works						500,000
Machinery & Equipment						500,000
Trucks						210,000
Vehicles	60,000					60,000
Office Furniture & Equip.						5,000
Working Capital						3,200,000
Total Recovery	60,000					4,475,000

3) Loan Amortization Schedule				
Year	Beginning Loan Balance	Annual Instalment Payment: \$569,569		Ending Loan Balance
		Principal	Interest	
1	3,500,000	219,569	350,000	3,280,431
2	3,280,431	241,526	328,043	3,038,905
3	3,038,905	265,678	303,891	2,773,227
4	2,773,227	292,246	277,323	2,480,981
5	2,480,981	321,471	248,098	2,159,510
6	2,159,510	353,618	215,951	1,805,892
7	1,805,892	388,980	180,589	1,416,912
8	1,416,912	427,878	141,691	989,034
9	989,034	470,666	98,903	518,368
10	518,368	517,732	51,837	636*

*Due to rounding difference.

Annual Instalment payment = Total Loan Balance/PVIFA (10%, 10yrs) => \$3,500,000/6.145 = \$569,569.

4) Production Cost Schedule								
Year	1	2	3	4	5	6	7	8
Project Capacity	50%	75%	100%	100%	100%	100%	100%	100%
Factory Cost:								
Direct Material (V)	3,000,000	4,500,000	6,000,000	6,000,000	6,000,000	6,000,000	6,000,000	6,000,000
Direct Labor (V)	600,000	900,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
FOH (Fixed)	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Dep. & Amortiz.(Fixed)	553,001	553,001	553,001	559,668	559,668	559,668	559,668	559,668
Adm. Costs (Fixed)	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Financial Costs (Fixed)	350,000	328,043	303,891	277,323	248,098	215,951	180,589	141,691
Total Production Cost	8,503,001	10,281,044	12,056,892	12,036,991	12,007,766	11,975,619	11,940,257	11,901,359

Continued ...

Year	9	10	11	12	13	14	15
Project Capacity	100%	100%	100%	100%	100%	100%	100%
Factory Cost:							
Direct Material (V)	6,000,000	6,000,000	6,000,000	6,000,000	6,000,000	6,000,000	6,000,000
Direct Labor (V)	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
FOH (Fixed)	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Dep. & Amortiz.(Fixed)	559,668	559,668	559,668	559,668	559,668	559,668	559,668
Adm. Costs (Fixed)	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Financial Costs (Fixed)	98,903	51,837					
Total Production Cost	11,858,571	11,811,505	11,759,668	11,759,668	11,759,668	11,759,668	11,759,668

5) Income Statement								
Year	1	2	3	4	5	6	7	8
Project Capacity	50%	75%	100%	100%	100%	100%	100%	100%
Revenue	10,000,000	15,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Production Costs	8,503,001	10,281,044	12,056,892	12,036,991	12,007,766	11,975,619	11,940,257	11,901,359
Marketing Costs:								
Variable cost	600,000	900,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Fixed cost	800,000	800,000	800,000	800,000	800,000	800,000	800,000	800,000
Total Cost	9,903,001	11,981,044	14,056,892	14,036,991	14,007,766	13,975,619	13,940,257	13,901,359
Operating Income	96,999	3,018,956	5,943,108	5,963,009	5,992,234	6,024,381	6,059,743	6,098,641
Income Tax (35%)	33,950	1,056,635	2,080,088	2,087,053	2,097,282	2,108,533	2,120,910	2,134,524
Net Income	63,049	1,962,321	3,863,020	3,875,956	3,894,952	3,915,848	3,938,833	3,964,117

Continued ...

Year	9	10	11	12	13	14	15
Project Capacity	100%	100%	100%	100%	100%	100%	100%
Revenue	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Production Costs	11,858,571	11,811,505	11,759,668	11,759,668	11,759,668	11,759,668	11,759,668
Marketing Costs:							
Variable cost	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Fixed cost	800,000	800,000	800,000	800,000	800,000	800,000	800,000
Total Cost	13,858,571	13,811,505	13,759,668	13,759,668	13,759,668	13,759,668	13,759,668
Operating Income	6,141,429	6,188,495	6,240,332	6,240,332	6,240,332	6,240,332	6,240,332
Income Tax (35%)	2,149,500	2,165,973	2,184,116	2,184,116	2,184,116	2,184,116	2,184,116
Net Income	3,991,929	4,022,522	4,056,216	4,056,216	4,056,216	4,056,216	4,056,216

6) Cash Flow Statement								
Year	0	1	2	3	4	5	6	7
Cash Inflow:								
Cash flow from operation:								
Net Income		63,049	1,962,321	3,863,020	3,875,956	3,894,952	3,915,848	3,938,833
Add: Depreciation		553,001	553,001	553,001	559,668	559,668	559,668	559,668
Interest: [I (1-TR)], i.e., I(1-0.35)		227,500	213,228	197,529	180,260	161,264	140,368	117,383
Cash inflow from operation		843,550	2,728,550	4,613,550	4,615,884	4,615,884	4,615,884	4,615,884
Add: Recovery of Fixed Asset						60,000		
Recovery of Working Capital								
Total Cash Inflows	0	843,550	2,728,550	4,613,550	4,615,884	4,675,884	4,615,884	4,615,884
Less: Total Cash Outflow	-10,130,000	800,000	800,000	80,000		300,000		
Net Cash Inflow	-10,130,000	43,550	1,928,550	4,533,550	4,615,884	4,375,884	4,615,884	4,615,884
PV of Birr 1 at 15%	1	0.87	0.756	0.658	0.572	0.497	0.432	0.376
PV of Net Cash Inflow at 15%	-10,130,000	37,889	1,457,984	2,983,076	2,640,286	2,174,814	1,994,062	1,735,572
PV of Birr 1 at 40%	1	0.714	0.51	0.364	0.26	0.186	0.133	0.095
PV of Net Cash Inflow at 40%	-10,130,000	27,053	743,572	1,085,840	686,474	404,515	265,210	164,879

Continued ...

Year	8	9	10	11	12	13	14	15
Cash Inflow:								
Cash flow from operation:								
Net Income	3,964,117	3,991,929	4,022,522	4,056,216	4,056,216	4,056,216	4,056,216	4,056,216
Add: Depreciation	559,668	559,668	559,668	559,668	559,668	559,668	559,668	559,668
Interest: [I (1-TR)], i.e., I(1-0.35)	92,099	64,287	33,694					
Cash inflow from operation	4,615,884	4,615,884	4,615,884	4,615,884	4,615,884	4,615,884	4,615,884	4,615,884
Add: Recovery of Fixed Asset	140,000		60,000					1,275,000
Recovery of Working Capital								3,200,000
Total Cash Inflows	4,755,884	4,615,884	4,675,884	4,615,884	4,615,884	4,615,884	4,615,884	9,090,884
Less: Total Cash Outflow	700,000		300,000					
Net Cash Inflow	4,055,884	4,615,884	4,375,884	4,615,884	4,615,884	4,615,884	4,615,884	9,090,884
PV of Birr 1 at 15%	0.327	0.284	0.247	0.215	0.187	0.163	0.141	0.123
PV of Net Cash Inflow at 15%	1,326,274	1,310,911	1,080,843	992,415	863,170	752,389	650,840	1,118,179
PV of Birr 1 at 40%	0.068	0.048	0.035	0.025	0.018	0.013	0.009	0.006
PV of Net Cash Inflow at 40%	90,187	62,924	37,830	24,810	15,537	9,781	5,858	6,709

b) Net Present Value (NPV)

$$\text{NPV at 15\%} = \$21,118,704 - \$10,130,000 = \$10,988,704$$

$$\text{NPV at 40\%} = \$3,631,179 - \$10,130,000 = (\$6,498,821)$$

$$\text{IRR} = 30.71\%$$

Decision: Accept the project because the NPV is positive and its IRR, 30.71%, is greater than its minimum required rate of return, 15%.

CHAPTER SEVEN: ECONOMIC APPRAISAL (ANALYSIS)

INTRODUCTION

Economic analysis analyses a project from the national point of view (or the economy as a whole). If projects are to be analyzed from the national point of view, adjustments may need to be made both to the items included as inputs and out puts of a project and to the prices at which these are valued.

Economic analysis, when applied to projects, is an analytical tool for planning and research and is a form of the more general tools of cost benefit analysis. The use of the word 'economic' implies the analysis is undertaken from the point of view of the nation or the economy as a whole. Economic analysis can therefore be seen as a cost-benefit analysis from the national perspective.

The differences between financial and economic viability are reflected in the differences of financial and economic analysis. While some of the actual tools of analysis are the same, financial analysis is concerned with private profitability and is based on financial flows which relate to:

- Market prices for products and inputs,
- The term of credit and borrowing in general,
- Tax and subsidy policy, and
- Financial depreciation and other financial conventions.

On the other hand, economic viability is concerned with public 'profitability' which is based on economic resource flows which relates to:

- Social opportunity costs (shadow prices),
- Divergence between real rate of interest and nominal (financial) rate of interest, and
- Difference between private and social/public rate of discount.

Economic analysis should be conducted where there is a good chance that the cost of doing the analysis will not exceed the likely benefit obtained from the information generated.

LEARNING OBJECTIVES

After studying this chapter, you should be able to:

- Differentiate between financial and economic analysis.
- Understand the rationale for economic analysis.
- Understand the shadow price, shadow wage rate, and social rate of discount.
- Understand the traded and non-traded goods.
- Differentiate between the world price (Little-Mirrlees Method) and the domestic price (UNIDO Method) system of economic analysis.

7.1. THE RATIONAL FOR ECONOMIC ANALYSIS

Social Cost and Benefit Analysis (SCBA), also called economic analysis, is a methodology developed for evaluating investment projects from the point of view of the society as a whole. This is basically used to evaluate public investments. However, it is also used in case of private investment, as these need approval by various governmental and quasi-governmental agencies.

In SCBA, the focus is on social costs and social benefits of the project. These differ from monetary costs and benefits of the project. The principal sources of discrepancy are (Beherens and Hawranck, 1991; Chandra, 1995, 2006; Cusworth and Tom, 1993; Cuury and Weiss, 1993; DEPSA, 1990; Gittenger, 1998; Squire and Vander Tek, 1992; UNIDO, 1978):

7.1.1. MARKET IMPERFECTION (MARKET PRICES ARE DISTORTED)

In many developing countries market prices are distorted by the presence of taxes and subsidies on goods, by the presence of monopoly production and consumption, and by the existence of economic of scale. Public goods such as education, health, and defense are not necessarily being sellable in the market at all and hence their value can not be ascertained by identifying market prices. These factors therefore distort the efficient allocation of scarce resources. **For example, the price paid by a consumer under rationing is often significantly less than the price that would prevail in a competitive market. Besides, the minimum wages prescribed is much more than the wages that would be paid in a competitive market situation.**

7.1.2. EXTERNALITIES (EXISTENCE OF EXTERNAL EFFECT)

External effect also prevents the achievement of economic efficiency through the market. These are real costs and benefits to the economy that do not affect the firms' financial calculations.

Externalities may be considered a special class of non-traded goods that may be either positive or negative. These "goods" or "bads" do not have a market price. For instance, Goods (positive externalities) arise from workers training, but the beneficiaries pay no charge; equally bads (negative externalities) arise from air pollution, but those adversely affected are not compensated. Hence, it may be necessary to take such externalities in to account and place a value on them for economic analysis when possible. **For instance, a project may create infrastructure facilities like roads that benefit the neighboring areas. However, it may cause environmental pollution.**

7.1.3. EXISTENCE OF STRUCTURAL RIGIDITIES (OR ADMINISTRATION OF FOREIGN EXCHANGE) IN THE ECONOMY

Another source of price distortion is the existence of the administration of foreign exchange in the national economy. This situation prevents markets from working properly. Thus, the relative prices of imports and exports are controlled through the foreign exchange rate.

7.1.4. MERIT WANTS (EXISTENCE OF SUB-OPTIMAL RATE OF INVESTMENT/COST OF CAPITAL IN THE ECONOMY)

The rate of investment can be lower than that desirable from the national interest point of view. This tends to reduce the rate of economic growth to below what is considered to be nationally desirable. **For example, an organization may run a policy of adult literacy program that is relevant from SCBA point of view. However, it does not have return on investment.**

7.1.5. TAXES AND SUBSIDIES

Taxes are monetary costs and subsidies are monetary gains. According to SCBA, taxes and subsidies are generally regarded as transfer payments and considered irrelevant. Tax is cost to payer while benefit to government; and subsidy is benefit or gain to receiver while it is cost to government who gives the subsidy.

7.1.6. CONCERNS FOR SAVING

According to SCBA, the division of benefits between consumption and saving is relevant in capital scarce developing countries and a **Birr** of benefit saved is more valuable than a **Birr** of benefit consumed because saving is used for future investment. Therefore, a higher valuation is placed on saving and a lower on consumption.

7.1.7. REDISTRIBUTION

A private firm is not concerned how its benefits are distributed across various groups in a society. But, the society is concerned. A **Birr** spent on poor is more valuable than spent on affluent (rich).

To summarize, therefore, economic analysis is designed to take in to account some or all of the above four factors. Shadow prices are required for economic analyses when ever market prices do not accurately expressed (distorted) the value or cost to the society of some items. As discussed above, discrepancies arise between market and economic values as a result of market imperfections, externalities, the impact of taxation and subsidies, and other government actions. Specifically, economic analysis is designed to cope with situation in developing countries when one or more of the following features are present:

- a) Domestic prices of imported goods differ substantially from world prices (shadow prices) of the same items. For example, price of fertilizers and petroleum,
- b) Labor is unemployed or under employed, especially in a rural areas,
- c) Labor costs are a significant proportion of total costs for many goods produced domestically,
- d) Foreign exchange is scarce and imported items are judged to be particularly valuable, and
- e) Investment is scarce and interest rates do not reflect rates of return on investment.

Activity 7.1: By taking two different projects that are currently undergoing in your environment, list their externalities and give your justification that they are externalities.

7.2. VALUATION AND SHADOW PRICES (THE USE OF TRADE OPPORTUNITY COST VALUES)

According to Little and Mirrlees, (1974) and UNIDO (1978, 1991), the economic analysis of a project requires that inputs and outputs be valued at their contribution to the national economy, through shadow prices (Accounting or world price), and it is the notion of opportunity cost that underlies the application of shadow prices in project analysis. From the national point of view, it is the alternative production forgone or the cost of alternative supplies that should be used to value project inputs and outputs.

7.3. BASIC PRINCIPLE OF SHADOW PRICE

The alternative source of supply for many inputs and outputs is through international trade. The price at which to value a project input is its import price if it has to be imported or its export price if greater domestic use led to a reduction in exports. Similarly, the price at which to value a project output is its export price if it adds to exports or its import price if local production led to a saving in imports. For such traded goods, since international trade forms the alternative source of supply, the use of world prices to value project inputs and outputs amounts to applying the principle of trade opportunity cost. However, this principle could not immediately be applied to all project inputs and outputs since not all actually enter in to foreign trade.

Shadow prices can be applied to a large number of different items, out of which the following are the most important ones (Gittinger, 1972, 1998; Little and Mirrlees, 1974; UNIDO, 1978, 1991).

7.3.1. SHADOW WAGE RATE (SWR)

The main principle of the valuation of labor from the national economy point of view is its opportunity cost to the economy; the opportunity cost of labor reflects its real resource cost. Therefore, we have to require output foregone by employing workers in the project we are considering and this is usually done by making the simpler neoclassical assumption that the “marginal product of a worker is equal to his/her wage.” His/her wage is therefore used as proxy for the value of a worker's output. If project workers were formerly employed elsewhere in the modern sector of the economy this might seem a simple matter of pricing of them at the wages they were receiving in their former employer. However, the case is not simple because it is most likely that their former employers will be able to replace them with the new recruits so that the ultimate source of our project's work force may be quite different from its proximate source. The approach taken by most economists to this question is to treat the rural economy as the employer of last resort and assume, therefore, that the ultimate source of new modern sector for unskilled employment is traditional agriculture. In this case, the marginal product of labor in traditional agriculture represents the opportunity cost and it is usually possible to obtain some indicators of the value of this.

Broadly speaking, the analyst must consider the project's impacts on the rest of the economy when it hires labor, for instance,

- (a) **The project may take labor away from other users** - the shadow price will be the willingness of other users to pay for this labor. If the market is relatively free, it will correspond to the marginal product of such workers.
- (b) **The project may stimulate the “production” of new workers:**
 - Employment of previously unemployed workers (i.e., transformation of non worker into a worker): - the basic cost of transforming an unemployed worker into an employed one is zero if the worker is truly unemployed, i.e., if his/her product is zero, because society gives up nothing to gain the additional worker.
 - Improved productivity of underemployed workers (i.e., transformation of a partial worker into a full time worker): - the cost of transforming an under employed person to a fully employed worker is the cost to society of giving up what little he/she may have produced in his/her former employment (his/her marginal product).
 - Urban employment of rural workers (i.e., transformation of a rural worker into an urban worker): - the cost of transforming a rural worker into an urban worker is the social cost of migration, which may be greater than the cost of providing housing, electricity, water, hospitals, schools, and other social services required by the migrant

who takes the job; the social cost should consider the marginal economic cost of producing an additional man-year of labor in the urban area.

- Skilled employment of previously unskilled workers (i.e., transformation of unskilled worker in to a skilled worker): - the cost of transforming an unskilled work in to a skilled worker, or in more general terms, of employing a worker with lower skills in a job requiring higher skills, is the cost of training.

- (c) **The project may cause the importation of workers** (i.e., importation of foreign workers when they are not available domestically) - the cost or the shadow wage for such labor is the wage they command.

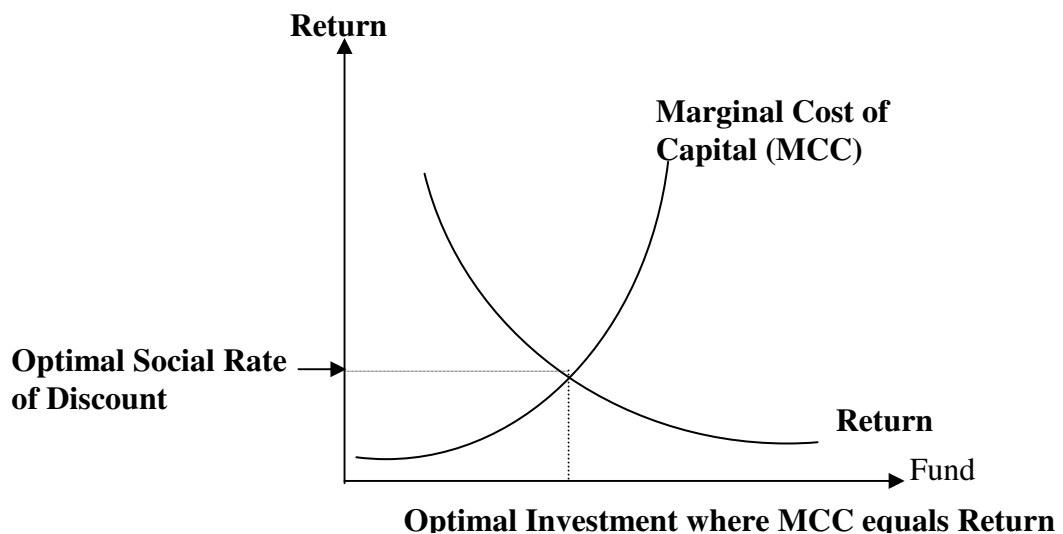
Activity 7.2: We know that our government is setting the salary scale for civil government employees. And one of your friends may say that this salary scale is the shadow wage rate (SWR). Do you agree? Why? Argue in brief.

7.3.2. SOCIAL RATE OF DISCOUNT (SRD)

The capital cost of a project can usefully be viewed from two perspectives for shadow pricing. These are the asset and the rent components. When \$ 100,000 is invested in project x, for example, two things happen. First, \$ 100,000 of financial resources is converted in to real physical assets. Second, the investor removes this \$ 100,000 worth of financial resources from the national pool of savings that might be used for investment in alternative projects. Once invested in project x, therefore, these assets should yield a benefit, or rent, at least equal to what they would have other wise earned somewhere else.

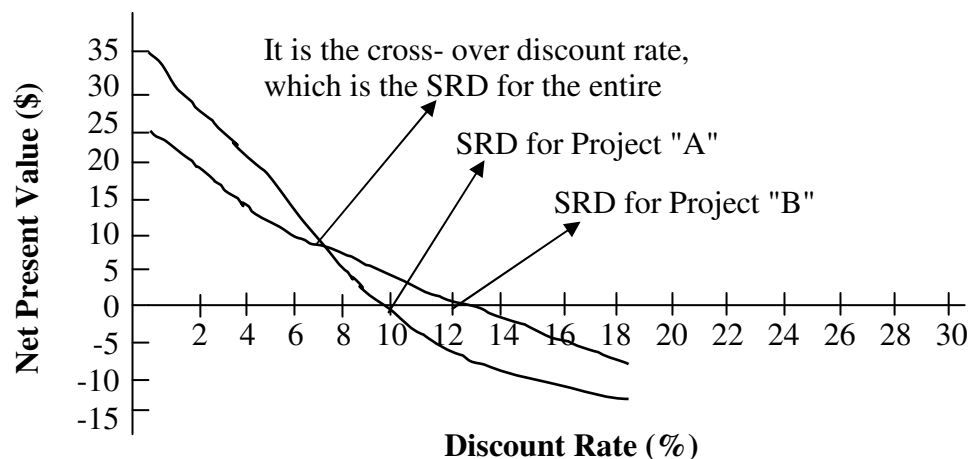
There are two alternative basis which we might estimate the Social Rate of Discount (SRD). The first of this suggests that we can use the SRD to balance the computing claims of the present generation and future generation; present consumption as against future consumptions. Viewed in this way, the SRD is an expression of society's time reference the rate of which our valuation of the worth of some given amount of consumption diminishes over time. This approach treats SRD as a budgetary device rather than as an economic reality that can be verified empirically. An alternative approach is to revoke the opportunity cost principle (or accounting rate of interest) that makes SRD an expression of the social marginal productivity of capital. If the margin in the application of public investment is expected to yield say 12%, then we should only under take projects that yield at least this rate of return.

Figure 7.1: Return vs. Marginal Cost of Capital



Because of the problem of determining empirically an appropriate SRD, it is recommended treating it as an unknown to be determined later as a “switching value”, that is, the value at which a project becomes acceptable. Switching value for one project is the value of the SRD that leaves a zero net present value for the project; it is the discount rate at which the net present value switches from positive to negative. Therefore, the switching value can also be regarded as the Internal Rate of Return (IRR) of the project. When more than one project is being considered, the switching value of the SRD is the discount rate at which one alternative comes to have a higher net present value than the other, a point also widely known as the cross-over discount rate.

Figure 7.2: Net Present Value vs. Social Rate of Discount



Economists differ in the solution they propose but probably the most widely adopted approach is to make the assumptions that fiscal policies would bring social time references into line with the social marginal productivity of capital and hence to estimate the SRD on the bases of marginal productivity. Here to then we are forced to the conclusion that the actual estimation of the SRD is at most an approximate exercise, a mater of taking market interest rate and adjusting them with such information as can be obtained on the social marginal cost of capital.

7.3.3. TRADED AND NON-TRADED GOODS

A central issue in shadow pricing is whether a good is “tradable” that is, can it be imported or exported? If a good is tradable, the international market place offers an option to domestic production and consumption and thus a measure of its economic opportunity cost or its “real” value to the country interims of pure efficiency. If for example, a country decides to produce refrigerators, it must consider the cost of production as against the “trading opportunity cost” of importing them. Conversely, when evaluating the cost of production, if domestically produced steel costing 40% more than the comparable import is to be used, the analyst must consider the trading opportunity cost of importing the steel instead.

Traded Goods are goods that would be imported or exported in the absence of trade barriers such as tariffs and quantitative restrictions, whose use for production by a project has a direct effect on the balance of payment. Their opportunity cost for the economy is their value on the world market. A number of different types of traded goods can be identified:

- a) **Exports** are goods that are exported as a result of a project would be traded directly. Their value to the economy would be their FOB export price.
- b) **Imports** are goods imported by a project. For example, machinery, raw materials, etc are traded directly. Their cost to the economy would be their C.I.F. import price.
- c) **Import substitutions** are goods whose production by a project saves imports; that is they will save foreign exchange to the economy equal to the C.I.F. price of equivalent imports.
- d) **Export Substitutions** are goods used as inputs by a project which could otherwise have been exported will have a cost to the economy equivalent to FOB export value they could have earned.

In all the above cases, the world price of these goods are used (C.I.F. for import items and F.O.B. for export items) not the price at which they sell domestically to measure the cost or benefit of the economy to the country, i.e., **their shadow price would be their world price**. In addition, each of these concepts applies to services as well as goods.

Non – Traded Goods are goods whose real domestic cost of production together with its international transport cost is too high to permit export and too low to make import attractive; in other words, a price higher than F.O.B. but lower than C.I.F. Their use for production by a project affects the domestic economy directly and the trade balance only indirectly. A number of types of non-traded goods may be distinguished (or identified).

- a) Some goods are non-traded because of their physical nature (i.e., physical immobility and high transport cost). They cannot enter international trade. For example, domestic transport, education and health, public utilities (such as power and water) and construction.
- b) Other goods may be non-traded if government policy prevent their import and export. For example, if import control prohibits importation of particular commodities, their local production will add to domestic supplies of these commodities rather than save foreign exchange through import substitution.
- c) Finally, other goods may be non-traded if it is not possible for a particular economy to trade internationally in the items concerned. This can arise if local production is of poor quality, type of design that cannot be exported.

In the case of non-traded goods, there would be either no comparable world prices or alternatively the world price will not represent the gain or loss to the economy from the use or production of the item. However, two alternative bases exist for the shadow prices of non-traded items whose use will depend upon what is assumed about the effect of the project under examination on the supplies of the relevant non-traded commodity.

- a) If use of non traded items by a project leads to an **expansion of its domestic production** to meet the needs of the project, the shadow price of the non traded items will be the value of the resources used in its production, them selves, measured in shadow prices. This is often the assumption adopted in the industrial project appraisal. As a short cut off to estimate average cost of production of a non-traded goods, the domestic market price often used as a rough estimate of its shadow price.
- b) The alternative to assuming that use of non-traded items in a project will lead to an **expansion of its supply** is to assume that supply remains constant and that the project under examination will divert the non-traded item away from other users. In this case, the shadow price will be the values the non-traded items would have produced in its alternative use. In practice, if this assumption is added, this is common to use the domestic market price of the non-traded goods as proxy for its value in other uses.

Activity 7.3: Identify which component of a building are tradable and non-tradable items with a brief explanation, and discuss their means of shadow pricing.

7.3.4. TREATMENT OF DIRECT TRANSFER PAYMENTS

Direct transfer payments are payments that represent not the use of real resources but only the transfer of claims to real resources from one person in the society to another. The most common form of direct transfers is the payment of taxes and the receipt of subsidies. These should be omitted from economic analysis. Financing items also need to be removed from project statements for economic analysis. The receipt of loan, the payment of interest, or repayment of a loan, transfers purchasing power but does not represent directly the use of resources.

Activity 7.4: Justify why taxes and subsidies are not considered in economic analysis with illustration.

7.4. USE OF CONVERSION FACTOR

Conversion factor (CF) can be used to revalue resources from their market to their shadow values. For each out put and input, a conversion factor can be calculated where the conversion factor is the ratio between shadow and market prices for the project item, so that (Chandra, 2006; DEPSA, 1990; Little and Mirrlees, 1974; Squire and Vander Tek, 1992; Ward and Deren, 1991; UNIDO, 1991):

$$\text{Conversion Factor (CF)} = \frac{\text{Shadow Price}}{\text{Market price}}$$

Then, **shadow price value = CF * Market price value.**

For example, if Radio components are to be imported at a C.I.F. price of \$ 1,000 per unit, but, after a tariff, will be bought by a factory for \$ 1,250 per unit; then, ignoring handling and other costs, the conversion factor for Radio components will be:

$$\text{CF} = \frac{\$1,000}{\$1,250} = \underline{\underline{0.80}}$$

Therefore, the \$81,250,000 (market price) value of the annual radio components at shadow price will be:

$$\begin{aligned} \text{Value at shadow price} &= 0.8 * \$ 81,250,000 \\ &= \underline{\underline{\$65,000,000}} \end{aligned}$$

Similar conversion factors can be calculated for all project outputs and inputs.

Conversion factors are based on the comparison of the national opportunity cost of a project item with its market price. For many project items, the opportunity cost will be given directly by its border price with minor modifications. The implicit objective of project analysis when project items are valued at opportunity cost is to maximize the net resources available to the economy.

However, shadow prices can be expressed in two ways. Either they can all be expressed directly in foreign exchange units, valuing all project effects at world prices [termed using a world price numeraire (Little-Mirrlees Method)] or they can be expressed in domestic price units [termed using a domestic price numeraire (UNIDO method)]. (Numeraire is a unit of account, the measure that makes it possible to add and subtract unlike items).

7.5. SOURCES OF SHADOW PRICES

Little and Mirrlees (1974) and UNIDO (1991) explained that in a perfect market, the shadow price for any resource would be its market price. In this ideal world, the price consumers were willing to pay for one more units (its marginal value) would be exactly equal to the producer's cost of supplying it (the marginal cost). If the resources were

traded internationally, the market price would also equal the relevant border price (C.I.F. for importable; F.O.B. for exportable). The price could not move higher, for consumers would import instead of paying more than the C.I.F. price to domestic producers; and it would not move lower, for producers would export rather than sell for less than the f.o.b. price on the domestic market.

Squire and Vander Tek (1992) and Ward and Deren(1991) also discussed that in the real world, because market imperfections such as tariffs, quotas and monopolies create distortions in demand and supply, there is little chance that the market price will reflect the true economic value and cost of inputs and outputs. For tradable resources, the domestic market price is likely to be higher than the border price. Because of market distortions, marginal social cost as seen from the supply side and marginal social value, as seen from the demand side for non- traded goods also will probably not be equal. It is therefore necessary to decide whether the project's impact will be on demand or supply to determine its shadow price.

The three recommended sources of shadow prices depend on the project's impact on the national economy. A project through its use and production of resources may for any given input or output affect the:

- Supply available to the rest of the economy
- Level of its production in the rest of the economy
- Level of its imports or exports

In terms of production of an output, the project may:

- Increase total consumption in the rest of the economy
- Decrease production in other parts of the economy
- Decrease imports or increase exports

The corollary impact of a project's consumption of inputs may be to:

- Decrease consumption in the rest of the economy
- Increase production within the economy
- Increase imports or decrease exports

For example,

<u>Impact</u>	<u>Basis for shadow pricing</u>
- Consumption within the economy	- Consumer willingness to pay
- Production within the economy	- Cost of production
- International trade	- Foreign exchange value

Table 7.1: A Guide to Shadow Pricing

Types of impact	Types of goods or services		Valuation (Shadow pricing)
	Input	Out put	
Domestic (non-traded)			
Production (supply)	More from local producers	Less by other local producers	Cost of production
Consumption (Demand)	Less to other local users	More to other local users	Value to consumer
Foreign (traded)			
Exports (supply)	Less export	More export	Value of export (f.o.b.)
Imports (demand)	More import	Less import	Cost of import (c.i.f.)

7.6. SHADOW PRICING AND THE NUMERAIRE

When domestic market prices differ from border prices for similar goods, the average difference defines the relation between the world price and domestic price numeraires. The use of a different numeraire to express opportunity costs will not affect the relative value of project outputs and inputs (Little and Mirrlees, 1974; UNIDO 1978, 1991).

Suppose there are two forms of output, both having the same foreign exchange effect; an export product worth £100 at the f.o.b. border price and an import substitute product worth £100 at the c.i.f. border price. At shadow prices given by their price at the border, these two products will be worth the same to the economy. If the official exchange rate between pounds and domestic currency (\$) is $\$15 = \pounds 1$, the foreign exchange effect of the export or the import substitute product in local (or domestic) currency is \$1,500.

Suppose there is no tax or subsidy on the export product (i.e., sellable in the domestic market at \$ 1,500) but there is an import duty on competing imports of 40% (i.e., the import substitute product is sellable in the domestic market at \$ 2,100=1.4x\$ 1,500). In domestic market prices, the import substitute has a higher price, although the value to the national economy at world prices is equal to that of the export product.

How can the domestic market prices for these two products be adjusted to reflect the fact that they are worth the same from the national point of view? The adjustment can take place in two ways; using:

(a) World Price Numeraire

The domestic market price of the import substitute needs to be adjusted down wards to its world price.

$$\begin{aligned} \text{World Price} &= \frac{\text{World Price}}{\text{Domestic Market Price}} \\ \text{Numeraire} &= \frac{\$1,500}{\$2,100} = 0.714. \end{aligned}$$

Then, the world price of the import substitute product is: $0.714 * \$2,100 = \$1,500$.

Therefore, it can then again be directly compared with the export product.

(b) Domestic Price Numeraire

The border price (world price) of the export product needs to be adjusted upwards to its equivalent domestic market price.

$$\begin{aligned} \text{Domestic Price} &= \frac{\text{Domestic Market Price}}{\text{World Price}} \\ \text{Numeraire} &= \frac{\$2,100}{\$1,500} \Rightarrow 1.40. \end{aligned}$$

Then, the domestic price of the export product is: $1.4 * \$1,500 = \$2,100$.

In general, the adjusted values for the export and import substitute goods will be equivalent.

Table 7.2: Price Numeraire

World Price Numeraire		Domestic Price Numeraire	
Export product	Import substitute product	Export product	Import substitute product
\$1,500	\$2,100 * 0.714 = \$1,500	\$1,500 * 1.4 = \$2,100	\$2,100

7.7. WORLD PRICE SYSTEM OF ECONOMIC ANALYSIS [LITTLE- MIRRLEES METHOD]

The Little-Mirrlees Method (LMM) uses world price numeraire in order to value project's costs and benefits from national point of view (Little and Mirrlees, 1974).

7.7.1. VALUATION TECHNIQUE

a) Valuation of Traded Goods

Traded goods are those whose production or use by a project has an effect on the country's balance of payments, because either the goods themselves are exported or imported, or because they are close substitutes for goods which are exported or imported. The extent to which the production or use of these goods affects the foreign exchange position of the economy is determined by their price on the world market (or border price).

The shadow prices based on the world market, with no reference to value in domestic use or supply, are used to value traded goods. World price are used because they represent the terms on which a country can participate in world trade and are there fore the opportunity cost of using or producing traded goods.

In a world price (border price) system, it is conventional to convert world prices in to local currency at the official exchange rate so that the shadow price of a traded good can be expressed as:

$$\text{Shadow Price} = \text{World Price} * \text{Official Exchange}$$

And its conversion factor is:

$$\text{Conversion Factor} = \frac{\text{Shadow Price (i.e., the world price numeraire)}}{\text{Domestic Price}}$$

The approach can be illustrated with a simple numerical illustration. An import substitute project produces an output with a CIF price of £100 per unit. The domestic price of the output in local currency is \$250. It is also stated that the official exchange rate between pounds and domestic currency is \$2 = £1. Therefore, the shadow price of the product in local currency is:

$$\begin{aligned} \text{Shadow Price} &= \text{World Price (Border Price)} * \text{Official Exchange Rate} \\ &= \text{£100} \times \$ 2 = \underline{\underline{\$200.}} \end{aligned}$$

And its conversion factor (or world price numeraire) is:

$$\begin{aligned} \text{Conversion Factor} &= \frac{\text{Shadow Price}}{\text{Domestic Price}} \\ &= \frac{\underline{\underline{\$200}}}{\$250} = \underline{\underline{0.80.}} \end{aligned}$$

Activity 7.5: Ethiopia has more than one cement factories that are supplying to the domestic construction works. Assume also that your best friend is intending to construct a private university in your environment. But he is doubtful on how to value the cement in his economic analysis. Thus, provide him your sincere advice with brief explanation.

b) Valuation of Non-traded Goods

Non-traded goods do not enter in to international trade, so that their production and use can only affect the supply available to the economy. Their valuation requires an estimate of their foreign exchange equivalent value, which takes account of their indirect foreign exchange effect. This can be done by decomposing their marginal cost of production in to the various resource categories embodied in them, that is essentially as traded goods and labor (skilled and unskilled). Once the cost breakdown being calculated, each of the resource categories is valued at its world price using the world price numeraire.

7.7.2. STANDARD OR AVERAGE CONVERSION FACTOR (SCF OR ACF)

Normally, in any economy there will be some divergence between world and domestic market prices for similar goods. A **weighted average ratio of world to domestic prices** for the main sectors of the economy is termed the average or standard conversion factor. It is often useful to have such an aggregate conversion factor to revalue relatively minor items for which detailed information is not available. For example, in the case of a non-traded input and output, if its share in total project costs is small, there may be little loss of accuracy in converting to world price by SCF (or ACF) rather than calculating a specific conversion factor.

$$\text{ACF (SCF)} = \frac{M + X}{(M + T_m - S_m) + (X - T_x + S_x)}$$

Where,

- M and X are the total value of imports and exports respectively in a given year, converted in to local currency at the official exchange rate,
- T_m and T_x are total trade taxes on imports and exports respectively, and
- S_m and S_x are total trade subsidies on imports and exports respectively.

ACTIVITY 7.6: Assume that your sister wants to commence an “Injera Bakery Project” and will construct the building using the local soil. But, she is doubtful on how to value the soil in her economic analysis. Therefore, give your unreserved advice with brief explanation.

Labor in a World Price System

In a world price system labor (along with all other inputs) must be valued at world prices. The direct and indirect foreign exchange consequences of additional employment by a project are estimated.

The shadow wage rate (SWR) can be expressed algebraically as:

$$\text{SWR} = \sum a_i m_i * CF_i$$

Where,

- a_i is the proportion of new workers coming from activity i,
- m_i is the output foregone at domestic market prices for workers drawn from activity i, and
- CF_i is the conversion factor for activity i to convert output foregone to world prices.

Land in a World Price System

The shadow price of land is given by its opportunity cost that is the net income at world prices that could be obtained from the land in its most likely alternative use. When land was previously unused its direct opportunity cost will be zero. Where the analysis is at world prices, land like all other inputs must be valued at world prices.

7.7.3. DISCOUNT RATE

It is specified as opportunity cost of investment funds reflecting either return available on alternative investment (where returns measured at world prices) or cost of additional borrowing from domestic or foreign sources.

7.7.4. SHADOW PRICE ADJUSTMENT

In order to revalue cost and benefits in terms of the world price numeraire, each item is broken down in to the following components:

Table 7.3: Social Conversion Factor

Classification	Adjustment factor (ACF or SCF)
Traded Goods	Valued at world price, hence SCF =1.00
Non-traded Goods	Standard Conversion Factor = 1.00
Labor:	
Skilled	Standard Conversion Factor =1.00
Unskilled	Standard Conversion Factor = 0.50

Note:

- a) The shadow price for traded goods is f.o.b. and c.i.f. price for export and import goods. It is already at world prices so it has a SCF or 1.0.
- b) There is considerable rural underemployment in developing countries. Thus, the lion's shares of unskilled workers are drawn from rural areas, and the SCF for unskilled labor at world price is 0.5. However, the SCF for a skilled labor at world price is 1.0, because, often, skilled labor has competitive market price.
- c) The SCF for non-traded goods is 1.0 because their shadow price is an equivalent world price.

7.8. DOMESTIC PRICE SYSTEM OF ECONOMIC ANALYSIS [UNIDO METHOD]

Under UNIDO method project costs and benefits are valued in terms of their opportunity costs in domestic prices and foreign exchange is revalued using a shadow exchange rate, SER, (UNIDO, 1978, 1991).

7.8.1. CHOICE OF PRICE UNITS

The choice of price units in which to express the value of project benefits and costs does not in itself determine the opportunity cost of an item. When domestic prices are the numeraire, the world price of these traded goods must be expressed as equivalent to a value in units of domestic prices. In addition, domestic market prices are used for non-traded goods because they are taken to be a reasonable proxy for the economic value of the good in units of domestic prices.

7.8.2. SHADOW EXCHANGE RATE (SER)

$$\text{SER} = \text{OER} (1+ P)$$

Where, P is the premium to adjust OER in to its market exchange rate.

The net effect of SER is to raise domestic prices for traded goods above border price (world price) if the OER does not reflect the full value of additional foreign exchange to the economy.

$$\text{SER} = \frac{\text{Domestic Price (DP)}}{\text{World Price (WP)}}$$

$$\begin{aligned} \text{Conversion Factor for Foreign Exchange} &= \frac{\text{SER}}{\text{OER}} \\ &= \frac{1}{\text{ACF}} \\ &= \frac{(M + T_m - S_m) + (X + S_x - T_x)}{(M + X)} \end{aligned}$$

For example, an import good is priced at £10, and at the official exchange rate of \$10 per £1, its price converts to \$100. However, domestic price are 40% above the world price. Hence, the domestic price of the import is raised to \$140. Therefore, the SER and CF for foreign exchange are:

$$\text{SER} = \frac{\text{DP}}{\text{WP}} = \frac{\$140}{\$100} = 1.40.$$

$$\text{CF for Foreign Exchange} = \frac{\text{SER}}{\text{OER}} = \frac{\$14}{\$10} = 1.40.$$

Traded and Non – Traded Goods in a Domestic Price System

The shadow price of a traded good in a domestic price system is the world price converted at the shadow exchange rate (SER). However, in the most approximate approach, domestic market prices of non-traded activities are used as a proxy for their shadow prices [i.e., the conversion factor in a domestic price system (domestic price numeraire) is 1.0]. Moreover, local materials are treated as non-traded inputs whose shadow and domestic market prices are equal. Also for skilled labor, market wages are taken as a proxy for output foregone at domestic prices. In contrast, the conversion factor or the domestic price numeraire is assumed to be 0.50 for unskilled labor.

7.8.3. SHADOW PRICE ADJUSTMENT

Breaking down each of the project costs and benefits as follows best carries out an economic analysis using a domestic price numeraire:

Table 7.4: Shadow Exchange Rate Adjustment Factor

Classification	Adjustment Factor
Foreign Exchange (traded-good)	Shadow Exchange Rate (SER)
Skilled Labor-----	----- 1.0
Unskilled labor-----	----- 0.5
Domestic (or Local) materials-----	----- 1.0
Externalities-----	----- 1.0

7.9. CHAPTER SUMMARY

Social Cost-Benefit Analysis (SCBA) is a methodology for appraising projects from the social point of view. It aids in evaluating individual projects within the national planning framework. It focuses on social costs and benefits of a project. The financial cost and benefit of a project differs from its social cost and benefit due to market imperfection, externalities, taxes, concern for saving, concern for income redistribution and merit wants.

SCBA is typically used by governments to evaluate the desirability of a given intervention. The costs and benefits of the impacts of an intervention are evaluated in terms of the public's willingness to pay for them (benefits) or willingness to pay to avoid them (costs). Inputs are typically measured in terms of opportunity costs - the value in their best alternative use. The guiding principle is to list all of the parties affected by an intervention, and place a monetary value of the effect it has on their welfare as it would be valued by them.

Unlike the financial cost and benefit of a project, its social cost and benefit are valued at shadow/boarder prices. A key issue in shadow pricing is whether a good is tradable or not. For tradable goods, the shadow price is FOB price for export and export substitutes and CIF price for import and import substitutes. For non-tradable goods, the domestic price shall be converted in to equivalent shadow price by using the social conversion factor (SCF).

The process involves, whether explicitly or implicitly, weighing the total expected social costs against the total expected social benefits of a project in order to choose the best or most profitable option. A hallmark of SCBA is that all benefits and all costs are expressed in money terms, and are adjusted for the time value of money, so that all flows of benefits and flows of project costs over time (which tend to occur at different points in time) are expressed on a common basis in terms of their present value.

The process involves monetary value of initial and ongoing costs vs. expected return. Constructing plausible measures of the social costs and benefits of specific project is often very difficult. In practice, analysts try to estimate costs and benefits either by using survey methods or by drawing inferences from market behavior. SCBA attempts to put all relevant explicit as well as implicit costs and benefits on a common temporal footing. A discount rate is chosen, which is then used to compute all relevant future costs and benefits in present-value terms.

When possible, project's social benefits and costs should be estimated and included even if they are not easily quantifiable. If some costs and benefits cannot be accurately estimated, they should at least be listed, along with the likelihood of their occurrence and their expected impact.

Project's social benefits might include cost savings; improved customer service, productivity, decision making, or data processing; better management control; increased job satisfaction and employee morale, number of jobs created (both directly and indirectly), amount of state tax revenue generated; etc.

Project's social costs might include equipment costs (initial outlay plus ongoing operating costs); software costs (costs of acquiring, maintaining, supporting, and operating); human resource costs (salaries, as well as costs of hiring, training, and relocating staff); site preparation costs; installation and conversion costs; supplies; overhead; financial charges; environmental pollution; etc.

The practice of SCBA differs between countries and between sectors (e.g. transport, health) within countries. Some of the main differences include the types of impacts that are included as costs and benefits within appraisals, the extent to which impacts are expressed in monetary terms and differences in discount rate between countries. Agencies across the world rely on a basic set of key cost-benefit indicators, including present value of benefits (PVB); present value of costs (PVC); net present value (NPV), benefit cost ratio (BCR), internal rate of return (IRR); etc.

The accuracy of the outcome of a cost-benefit analysis is dependent on how accurately costs and benefits have been estimated. The outcomes of cost-benefit analyses should be treated with caution, because they may be highly inaccurate. In fact, inaccurate cost-benefit analyses may be argued to be a substantial risk in planning, because inaccuracies of the size documented are likely to lead to inefficient decisions.

7.10. CHAPTER END QUESTIONS AND SOLUTIONS

(You are advised to attempt the following questions before looking at the solutions provided.)

The method followed by development banks to calculate the economic rate of return may be described as a “partial Little-Mirrlees” because while international prices are used for valuation of tradable inputs and outputs, L-M method is not followed in its entirety. The significant elements are described below (Chandra, 1995, 2006; UNIDO, 1978, 1991):

- 1) International prices are regarded as the relevant economic prices and it is necessary to substitute market price with international prices for all non-labour inputs and outputs.
- 2) For tradable items, where international prices are directly available, CIF prices are used for inputs and FOB prices are used for outputs.
- 3) For tradable items where international prices are not directly available and for non-tradable items (like electricity, transportation, etc) social conversion factors are used to convert actual domestic price in to social cost.

Assume that the social conversion factor (SCF) or proportion of three components, Tradable (T), Labour (L), and Residual (R) is given as follows:

Item	SCF or Proportion
Land	SCF = 1/1.5
Building and construction	Proportions: T= 0.5, L= 0.25, R= 0.25
Indigenous Equipment	SCF = 0.7
Transportation	Proportions: T= 0.65, L= 0.25, R= 0.10
Engineering and know how fees	SCF = 1.5
Bank Charges	SCF = 0.02
Preoperative Expenses	SCF = 1.00
Labour	SCF = 0.5
Salaries	SCF = 0.8
Repairs and maintenance	SCF = 1/1.5
Water, Fuel, etc.	Proportions: T= 0.5, L= 0.25, R= 0.25
Electricity	Proportions: T= 0.71, L= 0.13, R= 0.16
Domestic stores (Raw Material and Stores)	SCF = 0.8
Other overheads	SCF = 1/1.5

In some cases SCF is directly applied to the domestic price of the item like the Land that is 1/1.5. While in others the actual domestic price is broken down in to the proportion of T, L, and R, and then the grand total of each T, L, and R is converted using the SCF as follows:

Tradable	= SCF is 1/1.5
Labour	= SCF is 0.5
Residual	= SCF is 0.5

Illustration:

A new project for manufacturing a product that is currently being imported in the country is being appraised. The capital outlay (initial investment) of the project would be as follows (Birr):

1. Land	200,000
2. Building	10,000,000
3. Imported Equipment (CIF value is 6,000,000)	7,000,000
4. Indigenous Equipment (CIF value is 40,000,000)	50,000,000
5. Transport	1,000,000
6. Engineering and know how fees	5,000,000
7. Pre operating expense	4,800,000
8. Bank Charges	2,000,000
9. Working capital requirement consisting of only imported raw materials is (CIF value is 12,000,000)	16,000,000

The estimated annual profitability of the project is as follows:

Sales revenue (10,000 tons at Br. 10,000 per ton; CIF Price is Br. 7,000 per ton).

The estimated annual operating expenses of the project are as follows:

1. Imported raw materials (CIF value is 8,000,000)	10,000,000
2. Indigenous raw materials and stores	40,000,000
3. Labor	5,000,000
4. Salaries	3,000,000
5. Repairs and maintenance	1,000,000
6. Water, Fuel, etc	5,000,000
7. Electricity:	
Rate	3,000,000
Duty	2,000,000
8. Depreciation	4,000,000
9. Other overheads	7,000,000

The project life is estimated to be 15 years.

Required:

- 1) Compute the social cost of the Initial Investment.
- 2) Compute the social cost of the Annual investment (expenditures).
- 3) Compute the annual sales revenue at CIF price.
- 4) Compute the net annual annuity cash inflow taking in to account the recovery of working capital at the end of the project's life. Besides, all fixed assets are fully depreciated at the end of the 15 years.
- 5) Compute the economic rate of return that equates the present value of all social costs and present value of all social benefits.
- 6) Forward your opinion for accepting or rejecting the project.

SOLUTIONS

1. Social Cost of Initial Investment (i.e., one shoot) (In '000,000):

	Social Cost (Trad. Value)	Tradable Cost	Labor Cost	Residual Cost
Land (0.2 * 1/1.5)	0.133			
Buildings (0.5 : 0.25 : 0.25)	--	5.00	2.5	2.5
Imported Equipment (at its CIF Price)	6.00			
Indigenous Equipment (at its CIF Price, if any)	40.00			
Transport (0.65 : 0.25: 0.10)	--	0.65	0.25	0.10
Engineering and know how fees (5 * 1.5)	7.50			
Pre operating Expenses (4.8 * 1)	4.80			
Bank Charges (2 * 0.02)	0.04			
RM Imported, i.e., WC Requirement (at its CIF Price)	12.00			
Sub Total	70.473	5.65	2.75	2.60
Tradable Cost (5.65 * 1/1.5)	3.767			
Labor Cost (2.75 * 0.5)	1.375			
Residual Cost (2.60 * 0.5)	1.30			
Total Social Cost of Initial Investment	76.915			

2. Social Cost of Annual Investment (Expenditures) (In '000,000):

	Social Cost (Trad. Value)	Tradable Cost	Labor Cost	Residual Cost
Imported Raw Materials (at its CIF Price)	8.00			
Indigenous Raw Materials and Stores (40 * 0.8)	32.00			
Labor (5 * 0.5)	2.50			
Salaries (3 * 0.8)	2.40			
Repairs and Maintenance (1 * 1/1.5)	0.667			
Water, Fuel, etc (0.5 : 0.25: 0.25)	--	2.50	1.25	1.25
Electricity (0.71 : 0.13: 0.16)	--	2.13	0.39	0.48
Other Over Heads (7 * 1/1.5)	4.667			
Sub Total	50.234	4.63	1.64	1.73
Tradable Cost (4.63 * 1/1.5)	3.087			
Labor Cost (1.64 * 0.5)	0.82			
Residual Cost (1.73 * 0.5)	0.865			
Total Social Cost of Annual Investment	55.006			

3. Annual Sales Revenue (Benefit) at CIF Price:

10,000 Tons * Birr 7,000 = Birr 70,000,000.

4. Cash Flow Statement (in '000,000)

Year	Project Life							
	0	1	2	3	4	5	6	7
Sales Revenue		70	70	70	70	70	70	70
Add: Recovery of WC								
Total Cash Inflows		70	70	70	70	70	70	70
Less: Social Costs	(76.915)	55.006	55.006	55.006	55.006	55.006	55.006	55.006
Net Cash Inflow	(76.915)	14.994	14.994	14.994	14.994	14.994	14.994	14.994

Continued ...

Year	8	9	10	11	12	13	14	15
Sales Revenue	70	70	70	70	70	70	70	70
Add: Recovery of WC								12
Total Cash Inflows	70	70	70	70	70	70	70	82
Less: Social Costs	55.006	55.006	55.006	55.006	55.006	55.006	55.006	55.006
Net Cash Inflow	14.994	14.994	14.994	14.994	14.994	14.994	14.994	26.994

5. Economic Rate of Return (i.e., SRD or IRR)

The economic rate of return (SRD or IRR) is the rate of return at which the present value of social benefit equal to the present value of the social cost, i.e., Br. 76,915,000 = PVIFA k,14 (Br.14,994,000) + PVIF k,15(Br.26,994,000).

6. Decision

When there is a cut-off point as to the Economic Rate of Return (ERR), the project will be accepted if its IRR or SRD is greater than the given ERR. However, if there is no cut-off point, the project will be accepted when it has positive net present value computed using the Required Rate of Return; otherwise the project will be rejected.

CHAPTER EIGHT: PROJECT ENVIRONMENTAL IMPACT ANALYSIS

INTRODUCTION

Local officials, planners and developers increasingly recognize that economic development and environmental quality are equally important components of community growth. Unfortunately, this awareness comes after decades of environmental neglect: sprawling development beyond urban boundaries, rapid and irreversible conversion of prime agricultural land, loss of unique plant and animal communities, and increased pollution of water and air resources. It goes without saying that development often has substantial impacts on the quality and quantity of a community's air, land, water, and biological resources; yet, economic development often takes precedence over environmental protection.

The benefits of economic development are often more immediate, important, and obvious to community members and local officials: the creation of good-paying jobs; provision of affordable housing; and diverse shopping opportunities satisfy many of the priority needs and desires of local consumers. The benefits of environmental protection are often less evident and immediate, but are nonetheless important as natural resources continue to become scarce and threats to environmental and human health are ever-present. Yet, tradeoffs between economic development and environmental protection need not continue as Wisconsin communities continue to grow.

The purpose of this chapter is to help community members and local officials take a leadership role in ensuring that future development reflects environmental protection as well as fiscal, social, and economic community goals. This chapter defines environmental impact assessment; explains reasons for conducting an impact assessment; discusses who should be involved in the process and the limitations of the process; and provides guidance on how to conduct an environmental impact assessment.

Remember that Environmental Analysis is often required by law, but the process is intended to be a very useful planning tool to help make good decisions and improve projects.

LEARNING OBJECTIVES

After studying this chapter readers should be able to understand:

- The need for incorporating environmental considerations into planning, designing, implementing and regulating projects,
- The Environmental Analysis Framework, and
- The process of Environmental Analysis.

8.1. WHAT IS AN ENVIRONMENTAL ANALYSIS?

Environmental Analysis (EA) or Environmental Impact Assessment (EIA) is a systematic, interdisciplinary process used to identify the purpose of a proposed action, develop practical alternatives to the proposed action, and predict potential environmental effects of the action. A few examples of proposed actions are road construction, logging, tree clearing for disease control, reforestation, building a hydroelectric dam, or developing a quarry (Tiffen, 1989; Wathern, 1988).

An Environmental Analysis (EA) identifies problems, conflicts, or resource constraints that may affect the natural environment or the viability of a project. It also examines how a proposed action might affect people, their communities, and their livelihoods. The analysis should be conducted by an Interdisciplinary Team consisting of personnel with a range of skills and disciplines relevant to the project.

Community environmental impact assessment provides a systematic process for identifying, describing and evaluating community natural and human resources in order to improve decisions about their management. Choosing to assess the community environment does not imply that all identified resources must be preserved or protected. It does imply that the community must be knowledgeable about its resources, so that development decisions reflect the range of community values, not just economic values. An environmental impact assessment facilitates community planning by assisting local government officials, community leaders, and citizens (Birley, 1989; Petermann, 1993):

- Identify valuable environmental resources in the community and surrounding area that may be affected by a proposed development;
- Evaluate the community's capacity for additional development given environmental protection priorities;
- Identify the deficiencies or tradeoffs between possible development alternatives or courses of action and the environmental impacts associated with each alternative; and
- Determine which groups in the community may be directly or indirectly affected by the project or action.

8.2. WHO SHOULD BE INVOLVED IN THE PROCESS?

The environmental impact assessment process requires input from a variety of individuals including: professionals and civil servants with expertise in environmental science and engineering; local officials who are knowledgeable of local, state, and federal environmental management procedures and regulations; and members of the community who possess both expertise and interest in the local environment and natural resources.

Naturally, the developer, planner, local officials and perhaps a hired consultant should be involved in the process. Because the environmental impact assessment process often requires technical expertise and consideration of numerous environmental compliance issues, it is appropriate to involve other individuals such as an engineer, land or ecological conservation expert, state agency staff (e.g., Department of Natural Resources). Local conservation organizations such as land trusts and conservancies as well as the local offices of national organizations such as The Nature Conservancy are often an excellent source of information about local environmental concerns, community biological resources, and conservation tools.

Selecting the appropriate individuals to be involved in the assessment will ensure that more adequate (and accurate) consideration is given to potential impacts associated with the development. The up-front investment made in identifying and engaging relevant participants in the process will pay off in the long run as potentially costly mistakes in planning and estimating impacts are avoided.

8.3. WHY CONDUCT AN ENVIRONMENTAL IMPACT ASSESSMENT?

Economic, social and environmental change is inherent to development. Whilst development aims to bring about positive change, it can lead to conflicts. In the past, the promotion of economic growth as the motor for increased wellbeing was the main development thrust with little sensitivity to adverse social or environmental impacts. The need to avoid adverse impacts and to ensure long term benefits led to the concept of sustainability. This has become accepted as an essential feature of development if the aim of increased well-being and greater equity in fulfilling basic needs is to be met for this and future generations.

EIA helps to predict environmental impacts of any development activity and to provide an opportunity to mitigate against negative impacts and enhance positive impacts. An EIA may be defined as a formal process to predict the environmental consequences of human development activities and to plan appropriate measures to eliminate or reduce adverse effects and to augment positive effects (Birley, 1989; Petermann, 1993; Tiffen, 1989; Wathern, 1988).

EIA thus has three main functions:

- To predict problems,
- To find ways to avoid or reduce them, and
- To enhance positive effects.

The third function is of particular importance. The EIA provides a unique opportunity to demonstrate ways in which the environment may be improved as part of the development process. The EIA also predicts the conflicts and constraints between the proposed project, program or sectoral plan and its environment. It provides an opportunity for mitigation measures to be incorporated to minimize problems. It enables monitoring programs to be established to assess future impacts and provide data on which managers can take informed decisions to avoid environmental damage.

EIA is a management tool for planners and decision makers and complements other project studies on engineering and economics. Environmental assessment is now accepted as an essential part of development planning and management. It should become as familiar and important as economic analysis in project evaluation.

The aim of any EIA should be to facilitate sustainable development. Beneficial environmental effects are maximized while adverse effects are ameliorated or avoided to the greatest extent possible. EIA will help select and design projects, programs or plans with long term viability and therefore improve cost effectiveness.

It is important that an EIA is not just considered as part of the approval process. Volumes of reports produced for such a purpose, which are neither read nor acted upon, will devalue the process. A key output of the EIA should be an action plan to be followed during implementation and after implementation during the monitoring phase. To enable the action plan to be effective the EIA may also recommend changes to laws and institutional structures.

Initially EIA was seen by some project promoters as a constraint to development but this view is gradually disappearing. It can, however, be a useful constraint to unsustainable development. It is now well understood that environment and development are complementary and interdependent and EIA is a technique for ensuring that the two are mutually reinforcing. A study carried out by the Environmental Protection Agency (USA) in 1980 showed that there were significant changes to projects during the EIA process, marked improvements in environmental protection measures and net financial benefits. The costs of EIA preparation and any delays were more than covered by savings accruing from modifications, (Wathern, 1988).

For instance, irrigated agriculture is crucial to the economy, health and welfare of a very large part of the developing world. It is too important to be marginalized as it is vital for world food security. However, irrigated agriculture often radically changes land use and is a major consumer of freshwater. Irrigation development thus has a major impact on the environment. All new irrigation and drainage development results in some form of degradation. It is necessary to determine the acceptable level and to compensate for the degradation. This degradation may extend both upstream and downstream of the irrigated area. The impacts may be both to the natural, physical environment and to the human environment. All major donors consider large irrigation and drainage developments to be environmentally sensitive.

An EIA is concerned both with impacts of irrigation and drainage on the environment and with the sustainability of irrigation and drainage itself. Clearly an EIA will not resolve all problems. There will be trade-offs between economic development and environmental protection as in all development activities. However, without an objective EIA, informed decision making would be impossible.

Including an environmental analysis component in the overall development impact assessment process can (Petermann, 1993; Wathern, 1988):

- Promote communication among local officials, developers, community leaders and citizens about the nature of the proposal and potential impacts on the local environment;
- Ensure compliance with all relevant and appropriate environmental laws and regulations (e.g., storm-water management, compliance with wetland and floodplain regulations) during construction and operation of the new development;
- Ensure consistent and fair review of development proposals by applying a systematic review process that includes environmental assessment; and
- Provide a forum for exploring alternatives to the proposed development or strategies to mitigate impacts, if necessary.

For example, an environmental impact assessment can inform development decisions about the most suitable site for a housing development. While economics often drive such decisions, an environmental impact assessment can provide the stepping stone for exploring alternative sites that would minimize farmland conversion or other environmental impacts.

An environmental impact assessment can also aid in developing mitigation strategies for proposed development that are approved (e.g., site design elements that reduce storm water runoff volume or contamination). This is particularly useful since it is typically much easier to prevent problems from occurring in the design of the development than correcting problems after the development is built.

EIA was initially used for specific, particularly large scale, projects such as dams, which have obvious long-term consequences. Now, however, greater attention is given to the wider relationship between development and the environment. The relatively insignificant actions of many individual people may cumulatively have a much greater impact on the environment than a single construction project.

For example a program to support smallholder development, through agricultural credit schemes to water user groups, may not warrant an EIA if each scheme is considered in isolation. However, the impact within a river basin or in the water sector in a region can be significant. A sectoral or basin-wide EIA would enable an assessment of the collective impact of the program. Assume that a decision is made to provide free electricity to farmers to pump water for irrigation. Whilst this increased agricultural production will also lead to groundwater mining: the reduction in the groundwater level in some areas will have result in severe environmental and economic problems.

Thus, EIA must be incorporated into the planning process of a country, particularly a project, in order to enable the EIA process is of maximum benefit.

8.4. WHAT AN ENVIRONMENTAL IMPACT ASSESSMENT DOESN'T DO?

An environmental impact assessment provides general information about the potential for adverse environmental impacts associated with a proposed development, not detailed quantitative information for design or regulatory purposes (e.g., could indicate areas where private on site waste disposal may become a groundwater problem, not what density of housing will exceed contaminant attenuation capacity). Design standards and regulations typically require models with much greater data requirements.

Box 8.1. Recommended Good Practices of EIA

- Use the Environmental Analysis Process early during project planning and development.
- Open project information to public scrutiny.
- Involve all parties affected by the project, as well as the key Interdisciplinary Team Members.
- Communicate, Communicate, and Communicate!!! Communications between all interested parties is the key to understanding the issues and problems and to finding solutions.

Box 8.2. Bad Practices to Avoid in EIA

- Waiting until a project is fully planned or problems develop before doing Environmental Analysis.
- Getting lost in the “process” of EA studies.

8.5. THE CONTEXT OF ENVIRONMENTAL ANALYSIS

According to the Food and Agriculture Organization (FAO, 1992), an EIA can be explained from the following perspectives:

- Policy framework
- Social context
- Institutional framework and EIA
- Legal framework for EIA
- Building institutional capacity

8.5.1. POLICY FRAMEWORK

Policy issues have far-reaching consequences for the environment. Increasingly, at the national level, new environmental policies are being introduced, perhaps including a National Environmental Action Plan or National Plan for Sustainable Development. Such policies are often supported by legislation. Government policies in areas such as water, land distribution and food production, especially if supported by legislation, are likely to be highly significant for irrigation and drainage projects. An EIA should outline the policy environment relevant to the study in question. Results are also likely to be most easily understood if they are interpreted in the light of prevailing policies.

Policies and regulations are sometimes conflicting and can contribute to degradation. It is within the scope of an EIA to highlight such conflicts and detail their consequences in relation to the irrigation and drainage proposal under study. An example of conflicting policies would be an agricultural policy to subsidize agro-chemicals to increase production

and an environmental policy to limit the availability of persistent chemicals. A totally laissez-faire policy will result in unsustainable development, for example through uncontrolled pollution and distortions in wealth. This creates problems which future generations have to resolve. On the other hand, excessive government control of market forces may also have negative environmental impacts. For example, free irrigation water leads to the inefficient use of this scarce and expensive resource, inequities between head and tail users and water logging and salinity problems.

8.5.2. SOCIAL CONTEXT

A project or program and its environmental impacts exist within a social framework. The context in which an EIA is carried out will be unique and stereotype solutions to environmental assessments are therefore not possible. Cultural practices, institutional structures and legal arrangements, which form the basis of social structure, vary from country to country and sometimes, within a country, from one region to another. It is a fundamental requirement to understand the social structure of the area under study as it will have a direct impact on the project and the EIA.

Local, regional and national regulations, laws and organizations are interlinked. The way in which they are interlinked needs to be explicitly understood as part of the EIA. An understanding of the institutional and legal framework concerning the environment and irrigation and drainage development is critical to the success of any project or program. Indeed, it is likely that recommendations arising from the EIA will include restructuring or strengthening institutions, particularly at a local level, for example, ensuring adequate maintenance or effective monitoring of drain water quality. Recommendations for new legal controls or limits may also form part of the EIA output; for example, stipulating a particular flow regime in order to maintain a wetland.

At a local or regional level there may be particular regulations and customary practices which will influence environmental aspects of any project and these must be understood. The participation of local groups and the direct beneficiaries, mainly farmers, is essential to successful EIA. This may best be achieved by involving district councils. At the district level there is more interaction between sectors. Consultation with local interest groups, including non-governmental organizations (NGOs), will enable local views to be taken into account and their concerns addressed. An awareness of social and cultural problems may enable solutions to be found and conflicts to be averted before project implementation commences. Ignorance of a problem will prevent a satisfactory solution being found.

If land acquisition, economic rehabilitation (providing an alternative source of income) or resettlements of displaced people are factors in any proposed development, special care will be needed in carrying out the EIA. In most countries such issues are socially and politically sensitive and legally complex and must be identified early, during screening. They should be highlighted so that they are adequately studied by experts early in project preparation.

Poor people often find themselves in a vicious circle. They are forced by their poverty to exploit natural resources in an unsustainable manner and suffer from increasing poverty because of environmental degradation. They often inhabit fragile, marginal eco-zones in rural and, increasingly, semi-urban areas. High population growth is linked to poverty and further contributes to the dynamics of the vicious circle as ever increasing demands are made on finite natural resources. Therefore, the needs of the poor, their influence on the project and the project's impact on vulnerable groups all require particular attention in an Environmental Impact Analysis.

8.5.3. INSTITUTIONAL FRAMEWORK

Environmental, water and land issues involve many disciplines and many government bodies. Data will therefore have to be collected and collated from a wide range of technical ministries, other government authorities and parastatals. The interests of some bodies may not initially appear to be relevant to irrigation and drainage. However, they may hold important information about the project and surrounding area on such topics as land tenure, health, ecology and demography.

The link between different ministries and departments within ministries are often complex and the hierarchy for decision making unclear. There is a tendency for each ministry to guard "its project" and not consult or seek information from other government bodies unless forced to. This is directly contrary to the needs of an EIA. Even if formal structures exist there may be a lack of coordination between different organizations. Informal links may have been established in practice in order to overcome awkward bureaucratic structures. These issues must be understood and not oversimplified.

There may be conflict between government organizations, particularly between the institution promoting the development and that given the mandate for environmental protection. In countries where some planning processes are undertaken at the regional or district level, the regional or district councils make it easier for affected communities to put forward their views, which may differ from those of the central authorities. They will have different agendas and approaches. The EIA process must be interactive and be sympathetic to the differing views; not biased towards a particular organization.

For illustration, one of the main conflicts arising from irrigation and drainage projects is between those responsible for agriculture and those for water. In some countries, there are several key ministries with differing responsibility, such as agriculture, public works and irrigation, plus several parastatal organizations and special authorities or commissions, some perhaps directly under the Office of the President. The institutional aspects are complex; for example in Thailand, over 15 institutions have responsibility for various aspects of soil conservation work.

Increasingly, at the national level, new institutions are being created, or existing institutions reorganized, to address environmental issues. Often a Ministry of the Environment will be created with a mandate to prepare legislation, set standards and provide a "policing" role. In addition, an Environmental Protection Agency may also be created to coordinate environmental assessment activities and to monitor follow up actions. As well as specific environmental agencies, new units or departments concerned with environmental issues are being created in technical ministries. Such units may have narrow duties related to the responsibilities of the institution. For example, several units could be concerned with various aspects of monitoring water pollution levels and setting acceptable quality standards. The responsibilities of all the relevant institutions need to be clearly understood.

Institutional weakness is one of the major reasons for environmentally unsound development. The multiplicity of institutions may also mitigate against effective enforcement of environmental control measures. The EIA must cover such issues in depth and highlight contradictions, weak or impractical legislation and institutional conflicts. To overcome such problems, an EIA should propose appropriate solutions. This should include institutional strengthening.

8.5.4. LEGAL FRAMEWORK FOR EIA

Environmental policy without appropriate legislation will be ineffective as, in turn, will be legislation without enforcement. Economic and financial pressures will tend to dominate other concerns. In many developing countries legislation on environmental issues has been in existence for many years. For example, laws exist in most countries for the prevention of water pollution, the protection of cultural heritage and for minimum compensation flows. Much of the existing legislation or regulations have not been considered "environmental". Recently, much specific new environmental legislation has been enacted. This may be as a response to major disasters, or may result from government policy, public pressure or the general increased international awareness of the environmental dangers that now exist in the world. Relevant water and land law as well as environmental protection legislation needs stating, understanding and analyzing as part of an EIA.

New legislation may include a statutory requirement for an EIA to be done in a prescribed manner for specific development activities. When carrying out an EIA it is thus essential to be fully aware of the statutory requirements and the legal responsibilities of the concerned institutions. These are best given as an annex to the terms of reference. The legal requirements of the country must be satisfied. New laws can impose an enormous burden on the responsible agencies. The statutory requirement to carry out an EIA for specific projects will, for example, require expert staff to carry out the study, as well as officials to review the EIA and approve the project.

Laws designating what projects require EIA should, ideally, limit the statutory requirements to prevent EIA merely becoming a hurdle in the approval process. This will prevent large volumes of work being carried out for little purpose. Most legislation lists projects for which EIA is a discretionary requirement. The discretionary authority is usually the same body that approves an EIA. This arrangement allows limited resources to be allocated most effectively. However, it is essential that the discretionary authority is publicly accountable. When external financial support is required it will also be necessary to satisfy the obligations of the donor organization. Most major donors now require an EIA for projects relating to irrigation and drainage.

The function of environmental legislation can vary. It is not easy to give a precise definition of when an EIA is needed. Therefore the statutory requirement for an EIA is not particularly well suited to law. On the other hand many of the most important environmental hazards are easily addressed by law. For example, it is straightforward to set legal limits for pollution, flow levels, compensation etc: here the problem is one of enforcement. It is normal for an EIA to assess the acceptability or severity of impacts in relation to legal limits and standards. However, it is important to highlight cases where existing standards are insufficiently stringent to prevent adverse impacts and to recommend acceptable standards. Enforcement problems can be partially addressed by changing institutional structures.

Laws relating to irrigated lands are complex and according to a FAO study of five African countries, they are not generally applied (FAO, 1992). There are conflicts between modern and customary laws: the former tend to be given prominence although the latter are usually strong locally. Traditional and customary rights have often developed in very different historical and political contexts and can vary greatly over a short distance. They may also be mainly oral and imprecise. Local participation in the preparation of the EIA will help to understand important customary rights and highlight possible weaknesses in any proposed development.

8.5.5. BUILDING INSTITUTIONAL CAPACITY

Institutional capacity must be built in order:

- To carry out an EIA
- To implement the recommendations of an EIA

a) To carry out an EIA

It may be desirable to have a Ministry of the Environment (which will have responsibility for setting norms and new legislation) and an Environmental Protection Agency, EPA, (as a coordinating authority to orchestrate the cross-sectoral EIA activity). Whatever the institutional structure, the ministry promoting the development will usually be required to carry out an EIA or to commission others to carry it out on their behalf. The EIA will then be approved or otherwise by the central regulating authorities. To enable this process to function satisfactorily, trained staff will be required in:

- The environmental authority for commissioning and effective review and approval of EIAs,
- The technical authority for carrying out EIAs or preparing terms of reference or guidelines for others to do the work, and
- Universities and the private sector, should the work be put out to contract.

There is thus a clear need for skilled professional staff in a variety of organizations, who are familiar and competent with EIAs.

To achieve the required skills, training should cover all educational levels. Environmental studies should be introduced in schools and universities so that future expertise is nurtured. In-service training for both professional staff and technicians is important. Senior planners and decision makers also need to attend short environmental awareness programs so that they appreciate the issues raised in EIA reports and can make enlightened decisions.

If environmental assessment is a statutory requirement, local expertise will be needed to carry out the work that this will impose. For large projects, with external financial support, foreign expertise may be used but this would not be viable for most projects. Foreign consultants, because they are outsiders, are at a disadvantage in making recommendations that are realistic and implementable. Local expertise, for both the public and private sectors, must be developed through adequately funded training and technology transfer programs. Training should focus on the skills needed for an intersectoral decision making process at the crucial points in the project cycle. It should not aim to make pseudo EIA specialists out of other technical specialists.

In those countries where there is no central environmental authority and no statutory regulations for EIA the need for skilled staff will be equally important but less obvious. The pressure to carry out an EIA may come from external donors, the general public or specific pressure groups. In this case those who carry out the work may come from a small pool of academics or from external consultants. Part of their remit should be to train counterparts in government service. This situation is unsatisfactory in the long-term and will tend to restrict EIA to only the largest and most controversial projects. Governments must address this problem by appropriate policies for environmental protection and adequate resources to train skilled staff to carry out the work.

EIA is not a subject in itself but a procedure which relies on expertise from many disciplines. Training should not therefore be solely targeted to environmental scientists or ecologists. It is important that training is provided for specialists in all disciplines involved in an EIA, from scientists to sociologists and engineers to economists, so that they can contribute to meaningful EIAs.

Data are essential to an EIA and the organizations responsible for data collection and analysis, for meteorology, hydrology, water quality etc. should be strengthened (or established if not already existing). The organizations must be well funded so that the

data collected are reliable and complete and the staff well trained and motivated. Inadequate and unreliable data will result in poor studies based purely on qualitative analysis which can be subjective and easily refuted.

b) To implement the recommendations of an EIA

As part of an EIA, it may be necessary to consider how existing organizations will need to be changed or new laws promulgated in order to ensure environmentally sustainable development. The implementation of mitigating measures or monitoring will often have an impact on the work of one or several institutions. It will therefore be necessary to recommend precisely the structure and role of new units within an organization or the restructuring of existing units, so that the proposed measures can be implemented effectively.

The EIA should also give recommendations on local capacity building. Definition of such local needs may involve several national and local government authorities, NGOs or other participatory groups such as Water Users Associations and academic institutions. It is crucial that local and not just central government institutional capacity is strengthened. This will help to overcome the feeling that environmental issues are imposed from a remote central authority and are a diversion from more important development activities. It will also build into project planning the importance of environmental management.

Once a project has been approved, responsibility for ensuring that EIA recommendations are implemented may fall to a weak unit within the executing agency. This institutional weakness can considerably devalue an EIA and render it a mere hurdle on the path to implementation to be discarded once a project starts. When preparing an EIA it is essential that the environmental authorities are identified and strengthened to ensure they are not toothless. The authority responsible for project implementation should be accountable to "watchdog" environmental agencies. One way of ensuring this would be to link budget allocations from the Ministry of Finance/Planning to satisfactory performance.

8.6. HOW TO CONDUCT AN ENVIRONMENTAL IMPACT ASSESSMENT

This section discusses on the following resources, processes and procedures required for environmental impact analysis with a particular reference to environmental impact assessment of irrigation and drainage projects (Birley, 1989; Petermann, 1993; Tiffen, 1989; Wathern, 1988):

- Resources
- Screening
- Scoping
- Prediction and mitigation
- Management and monitoring
- Auditing
- Public participation
- Managing uncertainty
- Techniques
- Final report - Environmental impact statement

The EIA process makes sure that environmental issues are raised when a project or plan is first discussed and that all concerns are addressed as a project gains momentum through to implementation. Recommendations made by the EIA may necessitate the redesign of some project components, require further studies, and suggest changes which alter the economic viability of the project or cause a delay in project implementation. To be of most benefit it is essential that an environmental assessment is carried out to determine significant impacts early in the project cycle so that recommendations can be built into the design and cost-benefit analysis without causing major delays or increased design costs. To be effective once implementation has commenced, the EIA should lead to a mechanism whereby adequate monitoring is

undertaken to realize environmental management. An important output from the EIA process should be the delineation of enabling mechanisms for such effective management.

The way in which an EIA is carried out is not rigid: it is a process comprising a series of steps. These steps are outlined below and the techniques more commonly used in EIA are described in some detail in the section Techniques. The five main steps in the EIA process are (FAO, 1992):

- Screening
- Scoping
- Prediction and mitigation
- Management and monitoring
- Audit

Screening often results in a categorization of the project and from this a decision is made on whether or not a full EIA is to be carried out.

Scoping is the process of determining which are the most critical issues to study and will involve community participation to some degree. It is at this early stage that EIA can most strongly influence the outline proposal. The detailed **prediction and mitigation** studies follow scoping and are carried out in parallel with feasibility studies.

The main output report is called an Environmental Impact Statement, and contains a detailed plan for **managing and monitoring** environmental impacts both during and after implementation. Finally, an **audit** of the EIA process is carried out some time after implementation. The audit serves a useful feedback and learning function.

Figure 8.1 below shows a general flow diagram of the EIA process, how it fits in with parallel technical and economic studies and the role of public participation. In some cases, such as small-scale irrigation schemes, the transition from identification through to detailed design may be rapid and some steps in the EIA procedure may be omitted.

8.6.1. RESOURCES

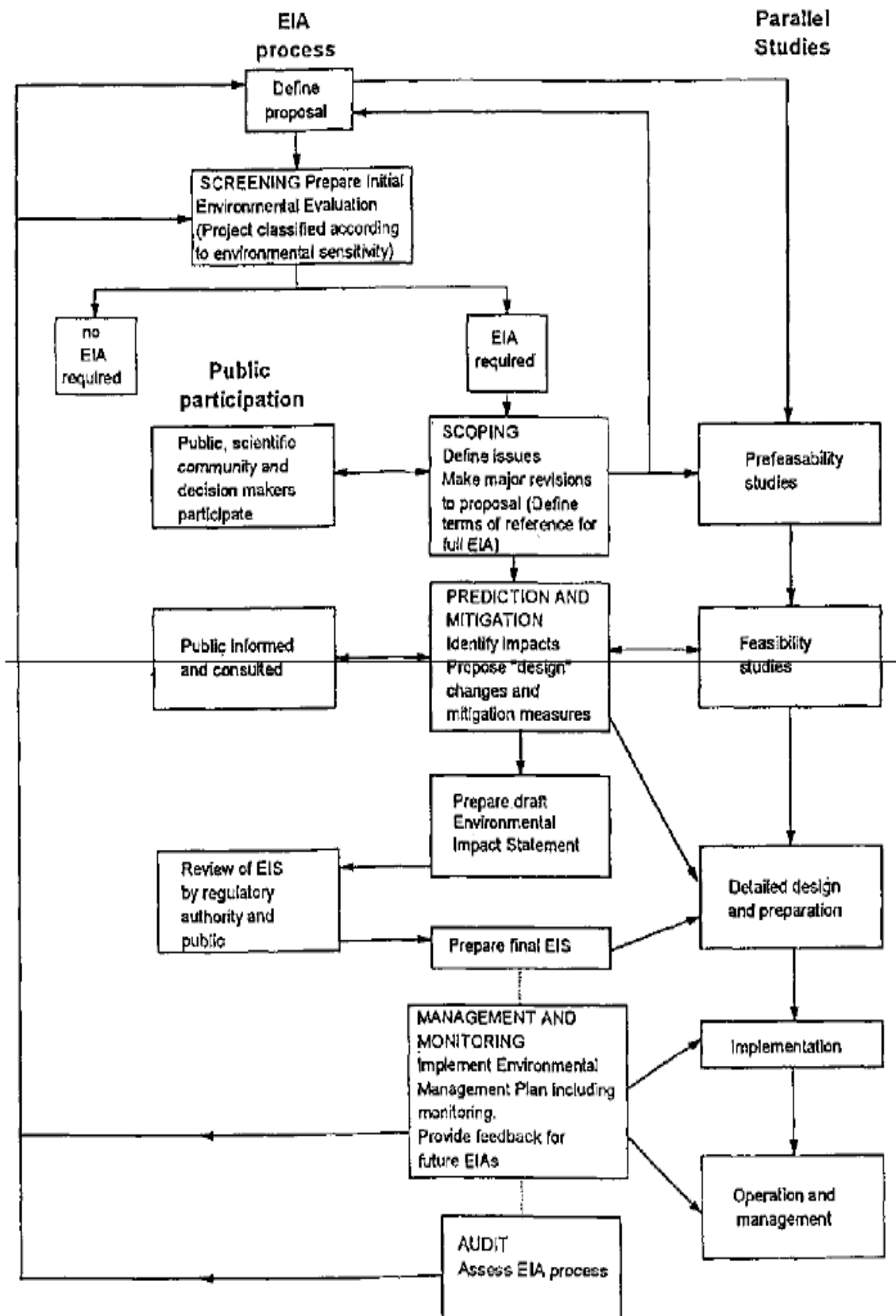
An EIA team for an irrigation and drainage study is likely to be composed of some or all of the following: a team leader; a hydrologist; an irrigation/drainage engineer; a fisheries biologist/ecologist; an agronomist/pesticide expert; a soil conservation expert; a biological/environmental scientist; an economist, a social scientist and a health scientist (preferably a epidemiologist). The final structure of the team will vary depending on the project. Specialists may also be required for fieldwork, laboratory testing, library research, data processing, surveys and modeling. The team leader will require significant management skill to coordinate the work of a team with diverse skills and knowledge.

There will be a large number of people involved in EIA apart from the full-time team members. These people will be based in a wide range of organizations, such as the project proposing and authorizing bodies, regulatory authorities and various interest groups. Such personnel would be located in various agencies and also in the private sector; a considerable number will need specific EIA training.

The length of the EIA will obviously depend on the program or project under review. It will normally be approximately the same length as the feasibility study of which it should form an integral part. It is essential that the EIA team and the team carrying out the feasibility study work together and not in isolation from each other. This often provides the only opportunity for design changes to be made and mitigation measures to be incorporated in the project design. The cost of the EIA study also varies significantly depending on the nature of the program or project.

8.6.2. THE FIVE STEPS IN EIA PROCESS

Figure 8.1: Flow diagram of the EIA process and parallel studies



a) Screening

Screening is the process of deciding on whether an EIA is required. This may be determined by size (e.g., greater than a predetermined surface area of irrigated land that would be affected, more than a certain percentage or flow to be diverted or more than a certain capital expenditure). Alternatively it may be based on site-specific information. For example, the repair of a recently destroyed diversion structure is unlikely to require an EIA whilst a major new headwork structure may. Guidelines for whether or not an EIA is required will be country specific depending on the laws or norms in operation. Legislation often specifies the criteria for screening and full EIA. All major donors screen projects presented for financing to decide whether an EIA is required.

The output from the screening process is often a document called an **Initial Environmental Examination or Evaluation (IEE)**. The main conclusion will be a classification of the project according to its likely environmental sensitivity. This will determine whether an EIA is needed and if so to what detail.

b) Scoping

Scoping occurs early in the project cycle at the same time as outline planning and pre-feasibility studies. Scoping is the process of identifying the key environmental issues and is perhaps the most important step in an EIA. Several groups, particularly decision makers, the local population and the scientific community, have an interest in helping to deliberate the issues which should be considered, and scoping is designed to canvass their views (Wathern 1988).

Scoping is important for two reasons. First, problems can be pinpointed early so that allowing mitigating design changes to be made before expensive detailed work is carried out. Second, to ensure that detailed prediction work is only carried out for important issues. It is not the purpose of an EIA to carry out exhaustive studies on all environmental impacts for all projects. If key issues are identified and a full scale EIA considered necessary then the scoping should include terms of reference for these further studies.

At this stage the option exists for canceling or drastically revising the project should major environmental problems be identified. Equally it may be the end of the EIA process should the impacts be found to be insignificant. Once this stage has passed, the opportunity for major changes to the project is restricted.

Before the scoping exercise can be fully started, the remit of the study needs to be defined and agreed by the relevant parties. These will vary depending on the institutional structure. At a minimum, those who should contribute to determining the remit will include those who decide whether a policy or project is implemented, those carrying out the EIA (or responsible for having it carried out by others) and those carrying out parallel engineering and economic studies relating to the proposal. A critical issue to determine is the breadth of the study. For example, if a proposed project is to increase the area of irrigated agriculture in a region by 10%, is the remit of the EIA to study the proposal only or also to consider options that would have the same effect on production?

A major activity of scoping is to identify key interest groups, both governmental and non-governmental, and to establish good lines of communication. People who are affected by the project need to hear about it as soon as possible. Their knowledge and perspectives may have a major bearing on the focus of the EIA. Rapid rural appraisal techniques provide a means of assessing the needs and views of the affected population.

The main EIA techniques used in scoping are baseline studies, checklists, matrices and network diagrams. These techniques collect and present knowledge and information in a straightforward way so that logical decisions can be made about which impacts are most significant. Risk and uncertainty are discussed further in the section managing uncertainty.

c) Prediction and mitigation

Once the scoping exercise is complete and the major impacts to be studied have been identified, prediction work can start. This stage forms the central part of an EIA. Several major options are likely to have been proposed either at the scoping stage or before and each option may require separate prediction studies. Realistic and affordable mitigating measures cannot be proposed without first estimating the scope of the impacts, which should be in monetary terms wherever possible. It then becomes important to quantify the impact of the suggested improvements by further prediction work. Clearly, options need to be discarded as soon as their unsuitability can be proved or alternatives shown to be superior in environmental or economic terms, or both. It is also important to test the "without project" scenario.

An important outcome of this stage will be recommendations for mitigating measures. This would be contained in the **Environmental Impact Statement (EIS)**. Clearly the aim will be to introduce measures which minimize any identified adverse impacts and enhance positive impacts. Formal and informal communication links need to be established with teams carrying out feasibility studies so that their work can take proposals into account. Similarly, feasibility studies may indicate that some options are technically or economically unacceptable and thus environmental prediction work for these options will not be required.

Many mitigating measures do not define physical changes but require management or institutional changes or additional investment, such as for health services. Mitigating measures may also be procedural changes, for example, the introduction of, or increase in, irrigation service fees to promote efficiency and water conservation. **Table 6** describes the most common adverse impacts associated with irrigation and drainage schemes and some appropriate mitigating measures.

By the time prediction and mitigation are undertaken, the project preparation will be advanced and a decision will most likely have been made to proceed with the project. Considerable expenditure may have already been made and budgets allocated for the implementation of the project. Major changes could be disruptive to project processing and only accepted if prediction shows that impacts will be considerably worse than originally identified at the scoping stage. For example, an acceptable measure might be to alter the mode of operation of a reservoir to protect downstream fisheries, but a measure proposing an alternative to dam construction could be highly contentious at this stage. To avoid conflict it is important that the EIA process commences early in the project cycle.

This phase of an EIA will require good management of a wide range of technical specialists with particular emphasis on:

- Prediction methods,
- Interpretation of predictions, with and without mitigating measures, and
- Assessment of comparisons.

It is important to assess the required level of accuracy of predictions. Mathematical modeling is a valuable technique, but care must be taken to choose models that suit the available data. Because of the level of available knowledge and the complexity of the systems, physical systems are modeled more successfully than ecological systems which in turn are more successfully modeled than social systems. Social studies (including institutional capacity studies) will probably produce output in non-numerical terms. Expert advice, particularly from experts familiar with the locality, can provide quantification of impacts that cannot be modeled. Various techniques are available to remove the bias of individual opinion.

Checklists, matrices, networks diagrams, graphical comparisons and overlays, are all techniques developed to help carry out an EIA and present the results of an EIA in a format useful for comparing options. The main quantifiable methods of comparing options are by applying weightings, to environmental impacts or using economic cost-benefit analysis or a combination of the two. Numerical values, or weightings, can be applied to different environmental impacts to (subjectively) define their relative importance. Assigning economic values to all environmental impacts is not recommended as the issues are obscured by the single, final answer. However, economic techniques can provide insight into comparative importance where different environmental impacts are to be compared, such as either losing more wetlands or resettling a greater number of people.

When comparing a range of proposals or a variety of mitigation or enhancement activities, a number of characteristics of different impacts need to be highlighted. The relative importance of impacts needs agreeing, usually following a method of reaching a consensus but including economic considerations. The uncertainty in predicting the impact should be clearly noted. Finally, the time frame in which the impact will occur should be indicated, including whether or not the impact is irreversible.

d) Management and Monitoring

The part of the EIS covering monitoring and management is often referred to as the **Environmental Action Plan** or **Environmental Management Plan**. This section not only sets out the mitigation measures needed for environmental management, both in the short and long term, but also the institutional requirements for implementation.

According to Craine (1971), the term 'institutional' is used here in its broadest context to encompass relationships:

- Established by law between individuals and government,
- Between individuals and groups involved in economic transactions,
- Developed to articulate legal, financial and administrative links among public agencies, and
- Motivated by socio-psychological stimuli among groups and individuals.

The above list highlights the breadth of options available for environmental management, namely: changes in law; changes in prices; changes in governmental institutions; and, changes in culture which may be influenced by education and information dissemination. All the management proposals need to be clearly defined and costed. One of the more straightforward and effective changes is to set-up a monitoring program with clear definition as to which agencies are responsible for data collection, collation, interpretation and implementation of management measures.

The purpose of monitoring is to compare predicted and actual impacts, particularly if the impacts are either very important or the scale of the impact cannot be very accurately predicted. The results of monitoring can be used to manage the environment, particularly to highlight problems early so that action can be taken. The range of parameters requiring monitoring may be broad or narrow and will be dictated by the 'prediction and mitigation' stage of the EIA. Typical areas of concern where monitoring is weak are: water quality, both inflow and outflow; stress in sensitive ecosystems; soil fertility, particularly salinization problems; water related health hazards; equity of water distributions; and groundwater levels.

The use of satellite imagery to monitor changes in land use and the 'health' of the land and sea is becoming more common and can prove a cost-effective tool, particularly in areas with poor access. Remotely sensed data have the advantage of not being constrained by political and administrative boundaries. They can be used as one particular overlay in a Geographic Information System (GIS). However, authorization is needed for their use, which may be linked to national security issues, and may thus be hampered by reluctant governments.

Monitoring should not be seen as an open-ended commitment to collect data. If the need for monitoring ceases, data collection should cease. Conversely, monitoring may reveal the need for more intensive study and the institutional infrastructure must be sufficiently flexible to adapt to changing demands. The information obtained from monitoring and management can be extremely useful for future EIAs, making them both more accurate and more efficient.

The Environmental Management Plan needs to not only include clear recommendations for action and the procedures for their implementation but must also define a program and costs. It must be quite clear exactly how management and mitigation methods are phased with project implementation and when costs will be incurred. Mitigation and management measures will not be adopted unless they can be shown to be practicable and good value for money. The plan should also stipulate that if, during project implementation, major changes are introduced, or if the project is aborted, the EIA procedures will be restarted to evaluate the effect of such actions.

e) Auditing

In order to capitalize on the experience and knowledge gained, the last stage of an EIA is to carry out an Environmental Audit some time after completion of the project or implementation of a program. It will therefore usually be done by a separate team of specialists to that working on the bulk of the EIA. **The audit should include an analysis of the technical, procedural and decision-making aspects of the EIA.** Technical aspects include: the adequacy of the baseline studies, the accuracy of predictions and the suitability of mitigation measures. Procedural aspects include: the efficiency of the procedure, the fairness of the public involvement measures and the degree of coordination of roles and responsibilities. Decision-making aspects include: the utility of the process for decision making and the implications for development, (adapted from Sadler as cited by Wathern, 1988). The audit will determine whether recommendations and requirements made by the earlier EIA steps were incorporated successfully into project implementation. Lessons learnt and formally described in an audit can greatly assist in future EIAs and build up the expertise and efficiency of the concerned institutions.

8.6.3. PUBLIC PARTICIPATION

Projects or programs have significant impacts on the local population. Whilst the aim is to improve the well being of the population, a lack of understanding of the people and their society may result in development that has considerable negative consequences. More significantly, there may be divergence between national economic interests and those of the local population. For example, the need to increase local rice production to satisfy increasing consumption in the urban area may differ from the needs as perceived by the local farmers. To allow for this, public participation in the planning process is essential. The EIA provides an ideal forum for checking that the affected public has been adequately consulted and their views taken into account in project preparation.

The level of consultation will vary depending on the type of program or project. New projects involving resettlement or displacement will require the most extensive public participation. As stated before, the purpose of an EIA is to improve projects and this, to some extent, can only be achieved by involving those people directly or indirectly affected. The value of environmental amenities is not absolute and consensus is one way of establishing values. Public consultation will reveal new information, improve understanding and enable better choices to be made. Without consultation, legitimate issues may not be heard, leading to conflict and unsustainability.

The community should not only be consulted they should be actively involved in environmental matters. Farmers, for example, with assistance from extension services, should be directly involved in environmental management. The earlier the public are

involved, the better. Ideally this will be before a development proposal is fully defined. It is an essential feature of successful scoping, at which stage feedback will have the maximum influence. Openness about uncertainty should be a significant feature of this process. As the EIA progresses, public consultation is likely to be decreased though it is important to disseminate information. The publication of the draft Environmental Impact Statement (EIS) will normally be accompanied by some sort of public hearing that needs to be chaired by a person with good communication skills. He/she may not be a member of the EIA team.

There are no clear rules about how to involve the public and it is important that the process remains innovative and flexible. In practice, the views of people affected by the project are likely to be heard through some form of representation rather than directly. It is therefore important to understand how decisions are made locally? And what are the methods of communication, including available government extension services? The ranges of groups outside the formal structure with relevant information are likely to include: technical and scientific societies; water user groups; NGOs; experts on local culture; and religious groups. However, it is important to find out which groups are under-represented and which ones are responsible for access to natural resources, namely: grazing, water, fishing and forest products. The views of racial minorities, women, religious minorities, and political minorities and lower cast groups are commonly overlooked (World Bank, 1991).

There has been an enormous increase in the number of environmental NGOs and "Green" pressure groups throughout the world. Such organizations often bring environmental issues to the attention of the local press. However, this should not deter consultation with such organizations as the approach to EIA should be open and positive with the aim of making improvements. Relevant NGOs should be identified and their experience and technical capacity put to good use.

In some countries, open public meetings are the most common technique to enable public participation. However, the sort of open debate engendered at such meetings is often both culturally alien and unacceptable. Alternative techniques must be used. Surveys, workshops, small group meetings and interviews with key groups and individuals are all techniques that may be useful. Tools such as maps, models and posters can help to illustrate points and improve communication. Where resettlement is proposed, extensive public participation must be allowed which will, at a minimum, involve an experienced anthropologist or sociologist who speaks the local language. He/she can expect to spend months, rather than weeks, in the field.

Information dissemination can be achieved using a number of mechanisms including the broadcasting media, in particular newspapers and radio. Posters and leaflets are also useful and need to be distributed widely to such locations as schools, clinics, post offices, community centers, religious buildings, bus stops, shops etc. The EIA process must be seen to be fair.

The public participation/consultation and information dissemination activities need to be planned and budgeted. The social scientist team member should define how and when activities take place and also the strategy: extensive field work is expensive. It is important to note that public participation activities are often reported as a separate section of the final EIA. Where experience of managing community involvement is limited, training is highly recommended.

8.6.4. MANAGING UNCERTAINTY

An EIA involves prediction and thus uncertainty is an integral part. There are two types of uncertainty associated with environmental impact assessments: associated with the process and associated with the predictions. With the former the uncertainty is whether the most important impacts have been identified or whether recommendations will be

acted upon or ignored. For the latter the uncertainty is in the accuracy of the findings. The main types of uncertainty and the ways in which they can be minimized are discussed by de Jongh (as cited by Wathern, 1988). They can be summarized as follows:

- Uncertainty of prediction: this is important at the data collection stage and the final certainty will only be resolved once implementation commences. Research can reduce the uncertainty,
- Uncertainty of values: this reflects the approach taken in the EIA process. Final certainty will be determined at the time decisions are made. Improved communications and extensive negotiations should reduce this uncertainty, and
- Uncertainty of related decision: this affects the decision making element of the EIA process and final certainty will be determined by post evaluation. Improved coordination will reduce uncertainty.

The importance of very wide consultation cannot be overemphasized in minimizing the risk of missing important impacts. The significance of impacts is subjective, but the value judgments required are best arrived at by consensus: public participation and consultation with a wide sector of the community will reduce uncertainty. One commonly recurring theme is the dilemma of whether to place greater value on short-term benefits or long-term problems.

The accuracy of predictions is dependent on a variety of factors such as lack of data or lack of knowledge. It is important not to focus on predictions that are relatively easy to calculate at the expense of impacts that may be far more significant but difficult to analyze. Prediction capabilities are generally good in the physical and chemical sciences, moderate in ecological sciences and poor in social sciences. Surveys are the most widespread technique for estimating people's responses and possible future actions.

The results of the EIA should indicate the level of uncertainty with the use of confidence limits and probability analyses wherever possible. Sensitivity analysis similar to that used in economic evaluation could be used if adequate quantifiable data are available. A range of outcomes can be found by repeating predictions and adjusting key variables.

EIA cannot give a precise picture of the future, much as the Economic Internal Rate of Return cannot give a precise indication of economic success. EIA enables uncertainty to be managed and is an aid to better decision making. A useful management axiom is to preserve flexibility in the face of uncertainty.

8.6.5. TECHNIQUES

The process of environmental impact analysis includes the following techniques:

- Baseline studies
- Check-list
- Matrices
- Network diagrams
- Overlays
- Mathematical modeling
- Expert advice
- Economic techniques

a) Baseline Studies

Baseline studies using available data and local knowledge will be required for scoping. Once key issues have been identified, the need for further in-depth studies can be clearly identified and any additional data collection initiated. Check-list will be found

useful to define both coarse information required for scoping and further baseline studies required for prediction and monitoring. Specialists, preferably with local knowledge, will be needed in each key area identified. They will need to define further data collection, to ensure that it is efficient and targeted to answer specific questions, and to quantify impacts. A full year of baseline data is desirable to capture seasonal effects of many environmental phenomena. However, to avoid delay in decision making, short-term data monitoring should be undertaken in parallel with long-term collection to provide conservative estimates of environmental impacts.

b) Check-list

A comprehensive and user-friendly checklist is an invaluable aid for several activities of an EIA, particularly scoping and defining baseline studies. The “ICID Environmental Check-List to Identify Environmental Effects of Irrigation, Drainage and Flood Control Projects” (Mock and Bolton, 1993) is recommended for use in any irrigation and drainage EIA. The Check-list has been prepared for non-specialists and enables much time-consuming work to be carried out in advance of expert input. It includes extensive data collection sheets. The collected data can then be used to answer a series of questions to identify major impacts and to identify shortages of data. A matrix indicates which data are linked to which questions.

The results sheet from the ICID Check-list is reproduced below in **Table 8.1**. The very simple layout of the sheet enables an overview of impacts to be presented clearly which is of enormous value for the scoping process. Similarly, data shortages can be readily seen. The process of using the ICID Check-list may be repeated at different stages of an EIA with varying levels of detail. Once scoping has been completed, the results sheet may be modified to omit minor topics and to change the horizontal classification to provide further information about the impacts being assessed. At this point the output from the Check-list can be useful as an input to matrices. The ICID Check-list is also available as a Windows based software package. This enables the rapid production of a report directly from the field study.

Table 8.1: The Result Sheet from the ICID Check-list (Reservoir Project)

Project name/location:		Assessment: 1st/2nd/	
Assessor's name/posit/on:		Date:	

Instruction: For each environmental effect, place a cross (X) in one of the columns.

Factors		Positive impact very likely	Positive Impact possible	No impact	Negative impact possible	Negative impact very likely	No judgment possible at present	Comments
		A	B	C	D	E	F	
Hydrology	1-1 Low flow regime							
	1-2 Flood regime							
	1-3 Operation of dams							
	1-4 Fall of water table							
	1-5 Rise of water table							
Pollution	2-1 Solute dispersion							
	2-2 Toxic substances							
	2-3 Organic pollution							
	2-4 Anaerobic effects							
	2-5 Gas emissions							
Soils	3-1 Soil salinity							
	3-2 Soil properties							
	3-3 Saline groundwater							
	3-4 Saline drainage							
	3-5 Saline intrusion							

Factors		Positive impact very likely	Positive Impact possible	No impact	Negative impact possible	Negative impact very likely	No judgment possible at present	Comments
		A	B	C	D	E	F	
Sediments	4-1 Local erosion							
	4-2 Hinterland effect							
	4-3 River morphology							
	4-4 Channel regime							
	4-5 Sedimentation							
	4-6 Estuary erosion							
Ecology	5-1 Project lands							
	5-2 Water bodies							
	5-3 Surrounding area							
	5-4 Valleys & shores							
	5-5 Wetlands & plains							
	5-6 Rare species							
	5-7 Animal migration							
	5-8 Natural industry							
Socio-economic	6-1 Population change							
	6-2 Income amenity							
	6-3 Human migration							
	6-4 Resettlement							
	6-5 Women's role							
	6-6 Minority groups							
	6-7 Sites of value							
	6-8 Regional effects							
	6-9 User involvement							
	6-10 Recreation							
Health	7-1 Water & sanitation							
	7-2 Habitation							
	7-3 Health services							
	7-4 Nutrition							
	7-5 Relocation effect							
	7-6 Disease ecology							
	7-7 Disease hosts							
	7-8 Disease control							
	7-9 Other hazards							
Imbalances	8-1 Pests & weeds							
	8-2 Animal diseases							
	8-3 Aquatic weeds							
	8-4 Structural damage							
	8-5 Animal imbalances							
	Number of crosses							(Total = 53)

c) Matrices

The major use of matrices is to indicate cause and effect by listing activities along the horizontal axis and environmental parameters along the vertical axis. In this way the impacts of both individual components of projects as well as major alternatives can be compared. The simplest matrices use a single mark to show whether an impact is predicted or not. However it is easy to increase the information level by changing the size of the mark to indicate scale, or by using a variety of symbols to indicate different attributes of the impact. An example of a matrix is given as **Table 8.2**. The choice of symbols in this

example enables the reader to see at a glance whether or not there was an impact and, if so, whether the impact was beneficial or detrimental, temporary or permanent. Figure 8 is another example of a matrix, in this case used to clearly indicate the importance of a range of wetland values.

ICOLD has prepared a large and comprehensive matrix for use in EIAs for dams. The system of symbols for each box shows: whether the impact is beneficial or detrimental; the scale of the impact; the probability of occurrence; the time-scale of occurrence; and, whether the design has taken the impact into account, (ICOLD, 1980). This comprehensive approach, however, makes the final output rather difficult to use and a maximum of three criteria is recommended per impact to maintain clarity. According to Ahmad and Sammy (1985, 1988), the most important criteria are: magnitude or degree of change, geographical extent and significance, and special sensitivity. "Significance" could be further sub-divided to indicate why an impact is significant. For example, it may be because of irreversibility, economic vulnerability, a threat to rare species, etc. "Special sensitivity" refers to locally important issues. A series of matrices at all stages of the EIA process can be a particularly effective way of presenting information. Each matrix may be used to compare options rated against a few criteria at a time.

The greatest drawbacks of matrices are that they can only effectively illustrate primary impacts. Network diagrams, described below, are a useful and complementary form of illustration to matrices as their main purpose is to illustrate higher order impacts and to indicate how impacts are inter-related.

Matrices help to choose between alternatives by consensus. One method is to make pair-wise comparisons. It provides a simple way for a group of people to compare a large number of options and reduce them to a few choices. First a matrix is drawn with all options listed both horizontally and vertically. Each option is then compared with every other one and a score of 1 assigned to the preferred option or 0.5 to both options if no preference is agreed.

Table 8.2: Ultimate net environmental impact assessment of a “Reservoir Project”

Features likely to be affected	Roads and trails	Colony construction	Blasting operation	Borrowing of materials	Importing of labor	Dam construction	Canal construction	Evacuation and rehabilitation	Soil conservation and landscaping	Reservoir filling	Irrigation	Hydro-power generation
Forestry/Vegetation	-1P	+2P			-1T	-1P	-1P	-1P	+4P	-3P	+3P	+1P
Birds			-2T			-2T	-1T		+3P	+4P	+2P	
Fisheries						-1T				+4P	+2P	
Other wildlife/land animals	-1P	-1T	-1T		-1T	-1T	-1T	-1P	+2P	+3P	+2P	
Sedimentation/erosion	-1T	-1T		-2T		+2P	+2P		+3P	-1P	-1P	
Floods						-1P	-1P		+1P	+3P		
Historical/cultural monuments		+2P								-2P		
Communications	+3P	+2P				+1P	+2P			-1P		+2P
Land/area development	-2P	+2P				+2P	+2P	-2P	+2P	+2P	+4P	+3P
Agriculture	+2P	+1P				-1P	-1P	-1P	+2P	-1P	+4P	+3P
Food production	+2P	+1P				-2P	-1P	-1P	+2P	-1P	+4P	+3P
Public revenue/income	+2P	+2P				+3T	+2P	-2P	+2P	-2P	+4P	+3P
Drinking water		+1P			-1T	-1T				+4P	+3P	+2P
Water quality			-1T	-1T	-2T	-2T				-1P	+1P	

Features likely to be affected	Roads and trails	Colony construction	Blasting operation	Borrowing of materials	Importing of labor	Dam construction	Canal construction	Evacuation and rehabilitation	Soil conservation and landscaping	Reservoir filling	Irrigation	Hydro-power generation
Air quality	-1T		-1T	-1T		-1T			+1P	+2P	+1P	
Climate									+1P	+2P	+1P	
Groundwater table										+2P	+2P	
Industrialization	+2P	+1P				+3T	+2T	+2P			+3P	+3P
Housing		+2P				+1P	+1T	+2P		-2P	+1P	+1P
Employment/training	+1T	+1T				+4T	+2T	+2P			+2P	+2P
Health and safety			-1T	-1T	-2T	-1T	-1T	-2T	+2p	+2P	+2P	
Scenic views and vistas	+1P	+2P		-1P	-2T	+2P	+2P		+3P	+4P	+2P	+2P
Tourism	+2P	+2P							+3P	+3P	+1P	+2P

Notes: Likely effect is symbolized as follows

	Mild	Considerable	High	Very high
Beneficial	+1	+2	+3	+4
Detrimental	-1	-2	-3	-4

Where, **T** = temporary effect; **P** = permanent effect

An example of a matrix is given as **Table 8.3**. As can be seen, **Z** is the preferred option. A number of methods have been developed to compare impacts by applying values to them. The relative importance of impacts, e.g., wetlands loss versus rare species loss, or the relative importance of criteria, e.g., economic vulnerability versus probability of occurrence, will depend on the local environment and priorities. Ranking, and therefore implicitly value, can be determined by using the pair-wise comparison technique described above, except that, rather than comparing options, criteria are compared instead. This can enable a series of weightings to be developed which will be entirely site-specific and dependent upon the subjective choices of those participating in the group which develops the weightings.

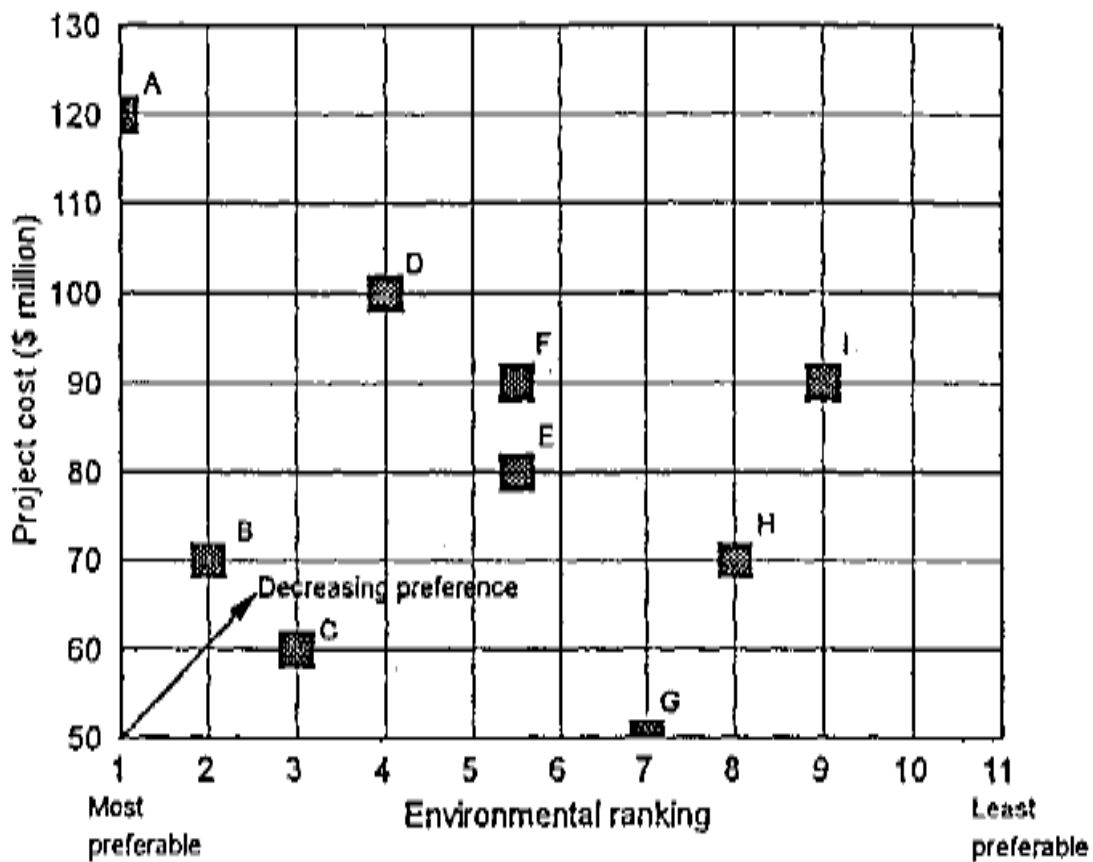
Table 8.3: Example of pair-wise comparison

Compare alternative	With alternative				Sum
	W	X	Y	Z	
W	-	0	0	0.5	0.5
X	1	-	1	0	2
Y	1	0	-	0	1
Z	0.5	1	1	-	2.5

A simple example would be to develop weightings for environmental versus economic acceptability. Thus, in the example illustrated in **Figure 8.2**, weightings would have to be developed to determine the preference for either **option B** or **option C**. Is more weight to be given to environmental or economic criteria?

Reducing information about impacts to a single number should be avoided as it obscures understanding and disguises the subjective nature of the analysis. However, it can be useful to compare, for example, the degree to which different mitigating options are effective in managing water quality.

Figure 8.2: Graphical comparison of alternatives. The final choice of either option B or option C will depend on the 'weighting' chosen (Ahmad and Sammy, 1985)



d) Network diagrams

A network diagram is a technique for illustrating how impacts are related and what the consequences of impacts are. For example, it may be possible to fairly accurately predict the impact of increased diversions or higher irrigation efficiencies on the low flow regime of a river. However, there may be many and far reaching secondary or tertiary consequences of a change in low flow. These consequences can be illustrated using network diagrams. For example, reduced low flows are likely to reduce the production of fish which may or may not be of importance depending on the value (either ecological or economic) of the fish. If fish are an important component of diet or income, the reduction may lead to a local reduction in the health status, impoverishment and possibly migration. Also, reduced low flow coupled with increased pollution, perhaps as a result of increased agricultural industry, may further damage the fish population as well as reduce access to safe water.

Table 8.4 shows an example of a network diagram for a proposed plan to increase the use of groundwater for irrigation by providing subsidies for sinking deep tube wells. This shows the primary through to quaternary impacts, as anticipated at the scoping stage. The main crop in the area is rice. Detailed prediction work following scoping would estimate the level to which the groundwater would fall and quantify the impacts which, together with economic analysis, would clarify which impacts were most important and most likely and also determine the most suitable mitigation measures.

Table 8.4: Example of network analysis showing the impact of a policy to utilize groundwater by subsidizing tube wells

Primary impacts	Secondary impacts	Tertiary impacts	Quaternary impacts	Mitigation	
Lowering of groundwater in dry season	Loss of income & water from domestic hand pumps	Use of poorer quality water	Increased health risks	1. Ensure that the new DTW either hold domestic water locally or feed into distributary system. Note Effected group are poorer people	
		Income diverted to buy water	Decreased income & time		
		Travel to distant source	Reduced quality of life		
	Loss of income & water from shallow tube wells for irrigation	Income diverted to buy water	Decreased income & time leading to possible food shortage		1. Deepen STW
		Crop failure	Reduced quality of life		2. Ensure new DTWs supply STWs in dry season
			Abandonment of land & migration		3. Provide compensation from DTW taxation
	Drawdown of surface water bodies	Decreased fish capture/fish mortality	Loss of protein intake		1. Artificially stock water bodies
			Loss of income for fishermen		2. Recharge water bodies from DTW Note: Fishermen are already poorer than farmers in general
		Loss of wetland	Loss of wetland flora/fauna migratory birds, fish spawning areas		
			Loss of wetland products		1.Restrict DTW development in vulnerable areas Note Landless & Rural poor are greatest users of wetlands
		Reduced navigation possibilities	Increased transport costs		1. Increase navigation depth by dredging
	Agricultural intensification	Increased fertilizer	Groundwater contamination by nitrate	Polluted drinking water by nitrate causes various illness, particularly in babies	1. Control fertilizer use 2. Educate users of groundwater as well as fertilizer users babies
			Eutrophication of surface water due to runoff	Increased weeds in channels & surface water bodies, algal blooms	1. Remove and control weeds 2. Educate about dangers of algal blooms
		Increased pesticide use	Groundwater contamination	More expensive alternative for drinking water must be found	
Poisoning of fish & shrimp			Reduction in fish catches & protein availability		2. Encourage rainwater storage
			Reduced income for fishermen		3 Encourage integrated pest management
			Bioaccumulation of pesticide in man		4 Subsidize non-persistent pesticides 5. Tax undesirable pesticides
Increased level of pest & diseases vectors due to loss of fallow period		Increased pesticide use	Bioaccumulation of pesticide in man		1. Vaccinate to prevent epidemics
		Increase in animal & human disease due to vector	Loss of quality of life		2. Encourage alternative cropping patterns 3. Educate about disease vectors

Primary impacts	Secondary impacts	Tertiary impacts	Quaternary impacts	Mitigation
	Reduced fallow land & grassland for grazing	Fewer livestock or poor quality livestock	Reduced protein intake & income for landless groups	1. Develop alternative grazing
	Reduced scrubland for fuel wood	Alternative sources sought for fuel	Income & time spent collecting fuel	1. Develop fuel wood supplies
			Destruction of trees	2. Introduce more efficient cookers

Where, **STW** = shallow tube wells; **DTW** = deep tube wells

e) Overlays

Overlays provide a technique for illustrating the geographical extent of different environmental impacts. Each overlay is a map of a single impact. For example, saline effected areas, deforested areas, limit of a groundwater pollution plume etc can be analysed and clearly demonstrated to non experts. The original technique used transparencies which is somewhat cumbersome. However, the development of Geographic Information Systems (GIS) can make this technique particularly suitable for comparing options, pinpointing sensitive zones and proposing different areas or methods of land management.

f) Mathematical Modeling

Mathematical modeling is one of the most useful tools for prediction work. It is the natural tool to assess both flow quantities and qualities (e.g. salt/water balances, pollution transport, changing flood patterns). However, it is essential to use methods with an accuracy which reflects the quality of the input data, which may be quite coarse. It should also be appreciated that model output is not necessarily an end in itself but may be an input for assessing the impact of changes in economic, social and ecological terms. For instance, the mathematical modeling was used very effectively to study a reservoir project in Nigeria. In this case the modeling demonstrated the most effective method of operating upstream reservoirs in order to conserve economically and socially valuable and ecologically important downstream wetlands. Optimal operation was found to be considerably different from the traditional method originally proposed. Under the revised regime the economic returns were also found to be higher.

g) Expert advice

Expert advice should be sought for predictions which are inherently non-numeric and is particularly suitable for estimating social and cultural impacts. It should preferably take the form of a consensus of expert opinion. Local experience will provide invaluable insight. Expert opinions are also likely to be needed to assess the implications of any modeling predictions. For example, a model could be developed to calculate the area of wetlands no longer annually flooded due to upstream abstractions. However, the impact on wetland species or the reduction in wetland productivity resulting from the reduced flooding may not be so precisely quantifiable but require a prediction based on expert opinion.

h) Economic techniques

Economic techniques have been developed to try to value the environment and research work is continuing in environmental economics. This is a specialist subject and only a brief introduction is included here. It is important to stress that environmentally sound development brings long term economic benefits. Unfortunately, short term gains are often given priority.

The most commonly used methods of project appraisal are cost-benefit and cost-effectiveness analysis. It has not been found easy to incorporate environmental impacts into traditional cost-benefit analysis, principally because of the difficulty in quantifying and valuing environmental effects. An EIA can provide information on the expected

effects and quantify, to some extent, their importance. This information can be used by economists in the preparation of cost-benefit calculations. Cost effectiveness analysis can also be used to determine the most efficient, least-cost method of meeting a given environmental objective; with costs including forgone environmental benefits. However, defining the objective may not be straightforward.

Valuing the environment raises complex and controversial issues. The environment is of value to the actual users (such as fishermen), to potential users (future generations or migrants), and to those who do not use it but consider its existence to have an intrinsic value (perhaps to their "quality of life"). Clearly it is difficult to quantify such values. Nevertheless, attempts have been made and the two most useful methods for irrigation projects in developing countries are "Effect on Production" (EOP) and "Preventive Expenditure and Replacement Costs" (PE/RC). The EOP method attempts to represent the value of change in output that results from the environmental impact of the development. This method is relatively easy to carry out and easily understood. An example would be the assessment of the reduced value of fish catches due to water pollution or hydrological changes. The PE/RC method makes an assessment of the value that people place on preserving their environment by estimating what they are prepared to pay to prevent its degradation (preventive expenditure) or to restore its original state after it has been damaged (replacement cost). Both methods have weaknesses and must be used judiciously (Winpenny, 1991).

Environmental health effects present similar problems, cost-effectiveness analysis is a useful tool in the selection of mitigating or control measures, but for ex-ante project appraisal the incompatibility of human health and monetary values has forced economists to develop other techniques and indicators. A recent publication by Phillips et al. (1993) deals with the principles and methods of cost-effectiveness analysis and its application to decisions about the control of vector-borne diseases, particularly the control of disease vectors. In its World Development Report (Investing in Health), the World Bank (1993) proposes the cost-utility analysis which expresses health status in DALYs (Disability Adjusted Life Years).

8.6.6. FINAL REPORT - ENVIRONMENTAL IMPACT STATEMENT (EIA)

The final report of an EIA is often referred to as an Environmental Impact Statement (EIS). In addition to summarizing the impacts of the alternatives under study this report must include a section on follow up action required to enable implementation of proposals and to monitor long-term impacts. The purpose of an EIA is not to reach a decision but to present the consequences of different choices of actions and to make recommendations to a decision maker. Recommendations are a crucial part of the Environmental Impact Statement. The format of the report should preferably follow a standard as recommended by the appropriate institution or required by legislation. For instance, FAO recommends that the executive summary of the EIS should only be 2 to 5 pages long and the main report, excluding appendices should be preferably about 50 pages long and no more than 100. An exceptionally complex study might require 150 pages.

Experts preparing an EIA must appreciate that the final report will be read by a wide range of people and the subject matter may be technically complex. Senior administrators and planners may not understand the importance of technical arguments unless they are presented carefully and clearly. The quality of the executive summary is particularly important as some decision-makers may only read this part of the report. The executive summary must include the most important impacts (particularly those that are unavoidable and irreversible), the key mitigating measures, proposed monitoring and supervision requirements, and the recommendations of the report.

The main text should maximize the use of visual aids such as maps, drawings, photographs, tables and diagrams. Matrices, network diagrams, overlays and graphical comparisons should all be included. The main text should cover the following points (EBRD, 1992) and World Bank (1991):

- A description of the program or project including the physical, social and ecological context as well as the time-scale of the proposals under study. Any major revisions made as a result of the scoping process should be identified here.
- A summary of the EIA methodology, including the limits of the study and the reasons for them.
- The policy, legal and administrative framework within which the project is situated.
- A summary of the baseline data providing an overall picture of present conditions and physical, biological and ecological trends. The consequences of the "no action" option should be described together with a brief description of other developments taking place and their relationship to the study proposal.
- A description of the governmental and non-governmental participation during the EIA.
- Environmental impacts. The most significant beneficial and adverse environmental impacts associated with the options studied need to be clearly stated. Impacts need to be quantified wherever possible and uncertainties in the results need to be highlighted, whether due to a lack of knowledge, lack of data or to critical but indeterminate assumptions such as future policy. The results of economic analyses need to be presented in the same section. Mitigation and enhancement measures that are proposed may either be presented together with information on the environmental impacts or as a separate section. Impacts with no effective mitigation need to be clearly identified as such.
- The Environmental Action Plan needs to be presented in two sections. The first part covers the implementation of proposed mitigation measures, including both costs and training, and institutional enhancements required to implement them. The second part should cover monitoring requirements to measure predicted impacts and to determine the success of mitigation measures. Again, costs and institutional requirements need to be included for each major proposal. A clear program of implementation should be given:
 - Recommendations and guidance to the decision maker.
 - A statement of provision for auditing, who should carry it out and when.

The appendixes should include:

- A glossary of technical terms and units
- A list of the team who prepared the EIA
- Records of public meetings and consultations
- A catalogue of information, both data and written material, and their source
- Technical information too detailed for the main text.

8.6.7. EVALUATION OF EIA METHODOLOGIES

An environmental impact assessment (EIA) must effectively deal with four key problems: (a) impact identification; (b) impact measurement; (c) impact interpretation, and (d) impact communication to users. These criteria can be used for analyzing a methodology and determining its weakness and strength. It also helps in choosing methods, which are most appropriate for a particular situation. The above five methodologies display variety in conceptual framework, data formats and data

requirements as well as in manpower, monetary and time resource requirements. An EIA team can use more than one method.

Table 8.5: Evaluation of EIA Methodologies

Methodology	Areas of Usefulness	Drawbacks
Checklists	<ul style="list-style-type: none"> ▪ Strong in impact identification. ▪ Effective in evoking public attention. ▪ Simple and easy to understand; comprehensive. <p>Most useful at the stage of initial environmental examination (IEE).</p>	<ul style="list-style-type: none"> ▪ Scaling and weighting subjective. ▪ Leaves interpretation to decision makers. ▪ Measurement deficient.
Matrices	<ul style="list-style-type: none"> ▪ Provides cause-effect relations between project activities and impact on various attributes. ▪ Graphical display of impact gives better understanding. ▪ Strong in impact identification and their interaction is possible. 	<ul style="list-style-type: none"> ▪ Information is lost due to quantification. ▪ Scaling and weighting become subjective.
Networks	<ul style="list-style-type: none"> ▪ Capable of identifying both direct and indirect effects and their interaction. ▪ Capable of incorporating mitigation and management measures at the planning stage of a project. 	<ul style="list-style-type: none"> ▪ Less useful in considering Socio-economic environment. <p>Display becomes large and unwieldy when large industrial complexes or regional plans are considered.</p>
Overlays	<ul style="list-style-type: none"> ▪ Useful in site and route selection. ▪ Effective presentation and display. ▪ Useful in transport projects and road route alternative; land use planning. 	<ul style="list-style-type: none"> ▪ Quantification and measurement weak. ▪ Not all impacts covered. Higher order impact cannot be identified. ▪ Social environment not considered. Subjective. ▪ Self-limiting in scope.

8.7. PREPARATION OF TERMS OF REFERENCE (TOR)

The need for EIAs has become increasingly important and is now a statutory requirement in many developing countries. Similarly, all major donors require some form of environmental analysis for irrigation and drainage projects. If an EIA is required, irrespective of the source of funding, the promoting agency will be required to either prepare it themselves or appoint others to do the study for them.

Usually government bodies do not employ sufficient staff to carry out EIAs. It is more cost effective to ask specialist consultants (local or foreign), universities or research institutions to carry out environmental assessments. In this case Terms of Reference (TOR) will have to be prepared by the project executing agency. As for any technical design or feasibility study, the terms of reference for the study will determine its ultimate value. The preparation of terms of reference can cause considerable difficulties for non-experts and brief guides to the major issues that must be addressed in the TOR are given below (Phillips et al., 1993).

- Determining study requirements
- Contents of the TOR

8.7.1. DETERMINING STUDY REQUIREMENTS

There are no universal formats for terms of reference which will be suitable for every study. However, there are general rules which should be observed when preparing TOR for the EIA of irrigation and drainage proposals. The study should ensure that the consultants focus on the major issues and the most serious likely impacts. The opportunities for enhancing any positive benefits from the project should also be highlighted.

The study should identify the relevant natural resources, the eco-system and the population likely to be affected. Direct and indirect impacts must be identified and any particularly vulnerable groups or species highlighted. In some instances views will be subjective and the consultants should give an indication of the degree of risk or confidence and the assumptions on which conclusions have been drawn. In most cases the output required will be a report examining the existing environment, the impacts of the proposed project on the environment and the affects of the environment on the project, both positive and negative, the mitigating measures to be taken and any actions needed. Interim reports, for example of baseline studies, should be phased to be of maximum value to parallel technical and economic studies.

The timing of the study is important. Scoping prior to a full EIA will enable the major issues to be identified. The terms of reference for the full EIA can then be better focused. The study should be carried out early enough in the project cycle to enable recommendations to be incorporated into the project design.

The requirements stated in the TOR will determine the length of time needed for the study, the geographical boundary of the EIA, its cost and the type of expertise required. Baseline data collection, if needed, can be time consuming and will have a major impact on the cost and time needed for the study. If considerable data exists, for example a good record of water quality information and hydrological statistics, the EIA may be possible without further primary data collection. If data are scarce, time must be allowed for field measurement and analysis.

Prior to writing the TOR the following questions should be asked:

- Is the study for an environmental scoping, a full EIA or other type of study? Before preparing the TOR the purpose must be clear.
- Is the study to be for a site specific project or a regional or sectoral program? The breadth of the study needs to be well defined.
- Will the EIA team be required to collect baseline data or does this already exist? The depth of the study and the type and quality of information already available or needed must be known.
- Who will use the final report? Different end users will often require different information. Readers may not be technical experts and careful thought should be given to the presentation of complex information.
- What output is required from the EIA study? Is an Environmental Action Plan to be prepared? A draft contents page for the final report as an annex to the TOR will give some guidance to the team carrying out the study.
- Is the team responsible for all issues or are other organizations (universities, government departments) responsible for some environmental studies? The TOR should clearly delimit responsibilities and give information on other work being done. If it is a requirement that the team liaise or work with other organizations, including NGOs, then this should be stated. Unabridged versions of the sub-contracted studies should be made available to the appraising authority for reference.
- What types of experts are needed in the team and for how long? An approximate estimate is needed to prepare a budget for the study and to estimate the time period. However, the TOR should not be too rigid on the number and type of expertise to be provided as there should be some flexibility for the team to decide on the most appropriate methodology and additional staffing.

8.7.2. CONTENTS OF THE TOR

The TOR should commence with a brief description of the program or project. This should include a plan of the area that will be affected either indirectly or directly. Basic data should be given on existing and proposed irrigation and drainage in the area and the catchment characteristics. The institutions that are involved in the proposal should also be given.

An overview of the local environment should follow the general description. This will include socio-economic information, land use, land tenure, water use in the area and any particular aspect of the flora and fauna. If other studies have been completed a list of available reports should be given.

A brief description should be given of the most important institutions, including those responsible for the EIA, the project executing agency and future managers. This should be presented in the form of an organogram.

A description of the work to be undertaken should give a general set of requirements for determining the potential impacts of, and impacts on, the proposed project. The TOR should require the consultants to cover the following points:

- Whether a range of proposals should be considered and if so whether they would be less environmentally damaging;
- The main environmental effects of the proposed project, both in the project area and in the surrounding area and the timescale of the impacts;
- The size and extent of the impacts based as much as possible on quantitative data rather than qualitative assessment. In some cases it may be necessary to highlight certain topics (such as water logging, resettlement etc) when a particular issue is known to be of concern. In most cases, however, it may be preferable not to mention any specific topic and make the consultant responsible for a complete review of all topics;
- Those groups that will benefit and those disadvantaged by the project;
- The impact on any rare species of plant or animal in the area;
- The impact on human health;
- The control and management aspects of the project to determine if they will be effective;
- The need for further baseline data collection or other specialist studies;
- The present policy, institutional and legislative situation and future needs;
- The mitigating measures needed and how they should be incorporated into the project design;
- The monitoring and evaluation activities that are required to ensure that mitigating measures are implemented and future problems are avoided.

The TOR should give an indication of the team considered necessary for the study. Depending on the scope of the study this may include one or several of the following: an irrigation specialist, drainage specialist, rural sociologist, terrestrial ecologist (of various specializations), aquatic ecologist/fisheries expert, hydrologist, agronomist, soil chemist or physicist, economist and epidemiologist. However, as mentioned earlier the team should not be rigidly imposed on the consultant.

It is important to make provision for technology transfer. Apart from enabling in country expertise to be built up, this will promote more involvement and understanding of the issues raised by the study. As most EIA studies are of relatively short duration, this is probably best achieved through the attachment of government staff to the consultants during the study or an insistence on the use of local government personnel for some of the tasks.

The expected date of commencement and time limit should be given. An environmental screening can be done quickly as part of the general project identification. In most cases scoping can be done in one to three months using checklists or other techniques assuming adequate data is readily available. Up to 12 months is needed for a full EIA for a medium or large scale project although this could be longer if the project is complex or considerable primary data have to be collected or field measurement undertaken.

The budget limit should be given in the TOR. The type of experts, and whether foreign or local, and the duration of their inputs will usually be the deciding cost factors although a large field survey or measurement program with laboratory analysis could significantly increase costs.

Any assistance to be provided by the client should be clearly stated in the TOR. Reporting requirements should be clearly stated. An annex giving a draft table of contents for the final report (the Environmental Impact Statement) is helpful, as this will standardize presentation and ensure all aspects are covered by the consultants.

8.8. MAJOR IMPACTS OF IRRIGATION AND DRAINAGE PROJECTS

When considering impacts, two perspectives must be taken into account, those of (Birley, 1989; Tiffen, 1989; Wathern, 1988):

- The project on the environment and
- External factors on the project (externalities).

Rehabilitation and changes resulting from alterations to the operating infrastructure, for example, will also have environmental impacts that may not at first be anticipated. The intensification of agriculture can lead to groundwater pollution related to the increased use of pesticides and fertilizers. Improved efficiency may significantly reduce return flows which are often utilized downstream by other irrigation schemes or wildlife habitats. Similarly, upstream developments are likely to impact on an irrigation scheme either in the form of reduced water availability (surface or groundwater) or reduced water quality.

Different types of irrigation will have different impacts and it should not be assumed that modern methods will have fewer impacts: they may significantly increase energy consumption and lead to social problems due to reduced employment in agriculture. Impacts will also vary according to the stage of implementation. For example, during the construction period there may be specific health and other social risks due to an influx of migrant workers living in temporary and unsanitary accommodation. Later, once the project has been operating for several years, cumulative impacts may begin to present serious environmental constraints to project sustainability. Such issues must be predicted by the EIA and mitigation measures prepared.

The most common problems of and threats to irrigation schemes are listed in **Table 8.6**, together with potential mitigation measures. Irrigation is defined as much, if not more, by farmers and managers as by the physical infrastructure; the 'hardware'. Its sustainable operation is just as dependent on the 'soft' environment: education, institutional building, legal structures and external support services. These are all powerful tools to ensure sustainability in conjunction with well-designed and well-managed hardware and **Table 8.6** indicates that many of the mitigation measures are 'soft'.

Table 8.6: Main problems resulting in the non-sustainability of irrigation and drainage schemes and appropriate mitigation measures

Problem	Mitigation measures
Degradation of irrigated land:	Improve Irrigation & Drainage operation to match demand both 'how much & when'.
Salinization	Provide drainage including disposal of water to evaporation ponds or the sea if quality of river flow adversely affected by drainage water.
Alkalization	Maintain channels to prevent seepage, and reduce inefficiencies resulting from siltation and weeds. Allow for access to channels for maintenance in design.
Water logging	Provide water for leaching as a specific operation.
Soil acidification	Set-up or adjust irrigation management infrastructure to ensure sufficient income to maintain both the irrigation and drainage systems.
	Analyze soils and monitor changes so that potential problems can be managed.

Problem	Mitigation measures
Reduced socio-economic conditions:	Manage Irrigation & Drainage to prevent disease spread.
Increased incidence of water related disease	Educate about causes of disease.
Increased inequity	Improve health facilities.
Weaker community infrastructure	Allow sufficient time and money for extensive public participation to ensure that plans are optimal, that all sections of affected society are considered and that local institutions are in place to sustain irrigated agriculture, particularly in respect of land and water rights.
	Consider markets, financial services and agricultural extension in conjunction with proposed irrigation and drainage changes.
	Ensure that agricultural intensification does not preclude other economic or subsistence activity, such as household vegetables, fodder or growing trees for firewood.
	Provide short-term support and/or skills for an alternative livelihood if irrigation removes existing livelihood
Poor water quality:	Define and enforce return water quality levels (including monitoring).
Reduction in irrigation water quality	Control industrial development.
Water quality problems for downstream users caused by irrigation return flow quality	Designate land for saline water disposal; build separate disposal channels.
	Educate for pesticide or sewage contamination dangers.
	Monitor irrigation water quality
Ecological degradation:	Define ecological requirements.
Reduced big-diversity in project area	Operate dams to suit downstream requirements and encourage wildlife around reservoirs.
Damage to downstream ecosystems due to reduced water quantity and quality	Designate land (in law and supported by protection institutions) for flood plains; wetlands; watersheds; drainage water disposal; river corridors.
Ground water depletion:	Define and enforce abstraction regulations.
Dry drinking & irrigation wells	Monitor ground water levels.
Saline intrusion at coasts	Adjust abstraction charges.
Reduced base flow/wetlands	

Box 8.3. Key Benefits of Project EIA include:

- Reducing cost and time of project implementation,
- Avoiding costly modification during implementation,
- Determining the proper balance between project needs and environmental impacts,
- Increasing project acceptance by the public,
- Avoiding negative impacts and violations of laws and regulations,
- Improving project design and performance,
- Producing a healthier environment by avoiding or mitigating problems, and
- Minimizing conflicts over natural resource use.

Detailed analysis of the impacts of an irrigation and drainage projects may address various dimensions such as its impact (negative or positive) on the hydrology, water and air quality, soil properties and safety effects, erosion and sedimentation, biological and ecological change, socio-economic, ecological imbalances and human health. EIA is a complex subject and multidisciplinary expertise will be required when preparing an EIA. Only brief introductions are made here in **Table 8.7**.

Table 8.7: Impact of irrigation and drainage projects

Dimensions	Salient factors to be considered in EIA
Hydrology: The consumptive nature of irrigation means that some change to the local hydrological regime will occur when new schemes are constructed and, to a lesser extent, when old schemes are rehabilitated	Low flow regime
	Flood regime
	Operation of dams
	Fall of water table
	Rise of water table

Dimensions	Salient factors to be considered in EIA
Water and air quality: The purer the water, the more valuable and useful it is for riverine ecology and for abstractions to meet human demands such as irrigation, drinking and industry. Conversely, the more polluted the water, the more expensive it is to treat to satisfactory levels.	Solute dispersion
	Toxic substances
	Agrochemical pollution
	Anaerobic effects
	Gas emissions
Soil properties and safety effects: A wide range of activities associated with an increased intensity of production can contribute to reduced soil fertility.	Soil salinity
	Soil properties
	Saline groundwater
	Saline drainage
	Saline intrusion
Erosion and sedimentation: Upstream erosion may result in the delivery of fertile sediments to delta areas. However, this gain is a measure of the loss of fertility of upstream eroded lands. A major negative impact of erosion and the associated transport of soil particles is the sedimentation of reservoirs and abstraction points downstream	Local erosion
	Hinterland effect
	River morphology
	Channel structures
	Sedimentation
	Estuary erosion
Biological and ecological change: An irrigation and drainage project brings ecological changes. The most obvious ones are a consequence of the change of land use and water use in the project area but effects on the land around the project and on aquatic ecosystems that share the catchment are likely.	Project lands
	Water bodies
	Surrounding area
	Valley sand shores
	Wetlands and plains
Socio-economic impacts: The major purpose of irrigated agriculture is to increase agricultural production and consequently improve the economic and social well-being of the area of the project. Although irrigation schemes usually achieve this objective, it could be more successful if more attention is paid to the social and economic structure of the project area.	Population change
	Income and amenity
	Human migration
	Resettlement
	Women's role
	Minority groups
	Sites of value
	Regional effects
	User involvement
	Recreation
Ecological imbalances: Without appropriate management measures, irrigated agriculture has the potential to create serious ecological imbalances both at the project site and in adjacent areas. Excessive clearance of natural vegetation cover in the command area, for example, can affect the microclimate and expose the soil to erosion, leading to a loss of top soil and nutrient leaching, . The removal of roots and vegetation disrupts the water cycle, increasing the rate at which water enters rivers and streams, thereby changing flow regimes and increasing siltation in the downstream zone.	Pests and weeds
	Animal diseases
	Aquatic weeds
Human health: Irrigated agriculture contributes substantially to conditions that favor good health: food security, an improved infrastructure allowing better access to and by health services and economic progress which permits rural households a greater purchasing power for drugs and health services. On the other hand there can be significant negative impacts such as vector-borne diseases (e.g., malaria, River blindness, brain fever, bilharzias).	Disease ecology
	Specific risks and counter measures
	Health opportunities

Box 8.4. Stresses on Environment

Environmentalists have identified four types of different stresses or pressures that are being continuously inflicted on environment. They are:

- **Eutrophic Stress**

It refers to the release of various kinds of wastes into the river and other water bodies and their consequent drying.

- **Exploitative Stress**

It refers to the exploitation of natural resources endowment for production and consumption purposes through agriculture, industry, extraction, fishing etc. It is important to note that the rate of exploitation has a relevance to the nature's capacity to reproduce.

▪ **Disruptive Stress**

It refers to the physical alterations in nature resulting from such activities like forest clearance, highways, railways, factory buildings and so on. These physical changes disturb the environmental and ecological balance.

▪ **Chemical and Industrial Stress**

It results mainly from the developments in “science and technology” and their applied fields like industry, warfare and agriculture. This comprises mainly the pollutants and effluents of all types, radiation etc.

Strategies to meet these threats to natural environment through pollution, destruction and over-use can be: (a) preventive or (b) regulatory. It is in this context that the environmental appraisal of projects is gaining significance with a hope of achieving sustainable development in harmony with environment.

8.9. CHAPTER SUMMARY

While the task of conducting an environmental impact assessment may seem daunting at first, it is important to recognize the importance of assessing the environmental impacts associated with community development. To do otherwise will likely result in an even greater challenge (and cost) of addressing adverse impacts in years to come.

Moreover, tremendous gains have been made by the communities, state government, and the universities in collecting and managing information about the natural resources. The process of conducting an environmental impact assessment is no longer as resource-intensive or time consuming, especially where baseline data about the current quality and use of natural resources have already been compiled. For communities that have not collected the relevant information for an environmental impact assessment, but are facing development pressure, now is the time to begin thinking about the long-term sustainability of the community. How does environmental protection fit into the future of the community? It may not be a paramount goal for community members, but must be balanced with other economic and social goals if the community’s quality of life is to be preserved. Citizen participation and input is an important part of the process; however, a professional environmental consultant or engineer may offer necessary technical support and analysis of the environmental impacts of a proposed development. It is up to the community that hires the consultant to provide direction to the investigation and review results with community values in mind, in order to ensure that the community can pursue its own vision for a quality life.

Annex 8.1: EIA Checklist by Wisconsin Department of Commerce, State of Wisconsin, USA.

LOCAL APPROVALS

Does the project meet with all of the local approvals, conditions, and zoning requirements?

1. What is the current zoning of the property? Any zoning changes (conditional use permit) needed for the project to move forward?
2. Does the project meet fire and police protection standards? What changes are needed to bring the project into conformity?
3. Does the project meet with local wetland, shoreline, erosion control, and buffer requirements?
4. How will the project or facility fit into the local community’s effective solid waste recycling program?
5. If wastewater is discharged to the local municipal treatment plant, can the community accept and handle the flow and treat the effluent?
6. Any health and safety risks associated with the project?
7. What types and levels of noise would be created by or associated with the project on a short-term or long-term basis? (e.g., traffic, construction, operations)

8. What type of light or glare will the proposed project produce? When will the light have the greatest impact?
9. What impact will the project have on the surrounding neighbors? Describe the types or kinds of existing facilities within a 1/2 mile radius of the project.
10. What impact will the project have on local streets and roads in the area? Describe any changes in traffic patterns, increased traffic to the area, traffic noises, etc.
11. Does the project need new roads, rail, airport services, and other infrastructure improvements such as storm drains, retention ponds, water supply and storage? Can the local community handle all of these special needs of the project?
12. What designated or informal recreational opportunities are in the immediate vicinity? Would the project displace any existing recreational uses?

ENVIRONMENTAL APPROVALS

Does the project meet with the federal and state environmental regulations? What is the likelihood that these permits can be obtained without significant objections from the local residents and environmental groups?

AIR

1. What types of emissions to the air would result from the proposal (e.g., industry source, dust, automobile, odors, smoke) during construction and when the project is completed? If any emissions, describe and given approximate quantities.
2. If the project needs an air permit and is located in a “non attainment” region of Wisconsin, does the project have the necessary air credits needed to off-set the source’s air emissions?
3. Does the source emit more than ten tons of toxic air pollutants? If so, does the project meet Maximum Achievable Control Technology (MACE)?

WATER

1. Is there any surface water on or in the immediate vicinity of the site (including year-round and seasonal streams, lakes ponds, and wetlands)?
2. Are there any irrigation or drainage ditches on or near the site?
3. Will the project require any work over, in, or adjacent to (within 200 feet) of the described waters?
4. Will any work be needed to fill or dredge materials placed in or removed from surface water or wetland?
5. Will the proposed project require surface water withdrawals or water diversions?
6. Does the project lie within a 100-year flood plain?
7. Does the project involve any discharges of wastewater to surface waters or to the ground? If so, does it meet the pretreatment requirements of the state and pretreatment requirements of the local municipality if the discharge is going to the municipal treatment plant?
8. Is the project over five acres in size or fall within the Standard Industrial Classification in the areas of transportation, plastics manufacturing, metal coatings, food processing, or lumber?
9. Could any waste materials enter ground or surface waters associated with the site?
10. If the location is near one of the four wild and scenic rivers in Wisconsin, has the National Park Service commented upon the project?

SOLID/HAZARDOUS WASTE

1. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill or hazardous waste that could occur as a result of this project?
2. Does [will] this project process solid or hazardous waste?
3. Does [will] this proposal transport solid or hazardous materials? Have the proper licenses been applied for and approved?
4. Does [will] this site have storage tanks, underground or above ground? If so, what will be stored in the tanks?
5. Is the site located on or near a landfill?

ENDANGERED SPECIES — PLANTS AND ANIMALS

1. What kinds of vegetation are found on the site?
2. What kinds of vegetation will be removed from the site?
3. Was the Wisconsin Natural Heritage Inventory Program contacted as to possible sightings or habitats on the site that may contain state and federal endangered species?
4. Is the site part of a migration route?
5. Does the project need state and federal opinion (U.S. Fish and Wildlife) or approval regarding impact to wildlife and endangered species?

HISTORICAL/ARCHEOLOGICAL SURVEYS/APPROVALS

1. Are there any places or objects listed on, or proposed for national, state, or local preservation registers known to be on or next to the site?
2. Did the State Historical Preservation Officer (SHPO) identify any historic buildings or archaeological sites which would be affected by the project?
3. If historic buildings and archaeological sites are present on the proposed development site, was documentation obtained from the SHPO as to their eligibility for the National Register of Historic Places?
4. If the SHPO agreed that the project would have an adverse effect, was there documentation of the Section 106 consultation process with the Advisory Council on Historic Preservation?

TRANSPORTATION IMPACTS

1. Is the project located in the state's non attainment region in terms of air quality standards? If so, will the project employ more than 100 workers?
2. Will the project require new roads, highways, and special access points to get to the site?
3. What impact will any new roads and highways have on the vicinity of the project?
4. Will the project use water, rail or air transportation?

FARMLAND PRESERVATION

1. Does the project involve conversion of existing farm land? If so, was the Department of Agriculture's Preservation Program contacted?
2. Does the project contain "prime, unique, or important" farmland as designated by the USDA?
3. If the land is located on any of the above classifications of farmland, did the USDA review the project?

CHAPTER NINE: PROJECT GENDER ANALYSIS

INTRODUCTION

The vitality of gender issues is being increasingly recognized, particularly in developing countries, and emphasis on gender **sensitivity** and **inclusiveness** is being called for its strong integration into development policies, programs and projects.

The essence of incorporating gender considerations in any development or management action is well acknowledged. Taking this into consideration, the focus and coverage of an initiative is the placing of gender within the context of overall development and management. Within these areas, the coverage of the cross-cutting program should be gender, environment and technology transfer in developing countries. There can be two complementary and supplementary objectives:

- To mainstream the principles of gender equity and responsiveness in development programs and projects
- To promote gender sensitivity and responsiveness in technology transfer, and in the application, adoption and use of environmentally sound technologies.

The program can be operationalized by outlining the strategies and mechanics of implementation, expected outputs, targets and results and timetable, based on these objectives. Success of gender initiatives will also rest on links with existing organizations/institutions (international and national) that have gender programs in order to develop and implement a monitoring system for gender-responsiveness in technology transfer.

LEARNING OBJECTIVES

After studying this chapter, readers are able to understand:

- The concepts of gender analysis,
- The role of gender in development projects,
- The rationale for gender analysis in development projects,
- The rationale for gender balance in development projects, and
- How to develop and use gender criteria in the analysis, planning, implementation and evaluation of development programs and projects.

9.1. GENDER ANALYSIS- THE CONTEXT

9.1.1. WHAT IS GENDER ANALYSIS?

Gender analysis explores the nature of gender differences. ILO (1998) underlined that one we have to systematically ask questions about differences between men and women in a given population in doing gender analysis. Gender differences can be analyzed with respect to:

- Roles and activities,
- Resources and constraints,
- Benefits and incentives,
- Gender needs,
- Constraints and opportunities, and
- Gender roles. These factors are further discussed as follows.

a) Roles and Activities

- Who does what: productive activities? Household reproductive activities (child care, cooking, water and fuel collection)? Recreation?
- Who does the work: women? Men? Girls? Boys? Is it done by both women and men? By only one of them?
- How long does it take? Is the work seasonal? Monthly? Weekly? Daily?
- Where is the work carried out: home? Farm? City? Factory?
- How rigid is the gender division of labor?

b) Resources and Constraints

- What resources do men and women have to work with?
- Who uses/owns/controls each of these resources? Who is excluded from use/ownership/control?
- What decisions do men and women make: in the household? In the community?
- Are constraints to participation in social and economic life different for men and women?

c) Benefits and Incentives

- Who controls productive activity? Reproductive activity?
- Who benefits from economic activity? Who receives income? Who controls income? What about non-income benefits?
- Do men and women have different incentives for participation in these activities?

In other words, gender analysis entails, first and foremost, collecting gender-disaggregated information about the concerned population.

In order to undertake gender analysis, you must be familiar with some basic concepts. The next section (9.1.2) discusses some of the most important concepts. First, you can learn the conceptual difference between the terms "sex" and "gender". Then you can work with the concepts of gender roles and gender needs.

d) Gender Needs

Because the roles of men and women in societies are often different, their needs vary accordingly. Moser (1989) made conceptual distinction between practical and strategic gender needs. She defines these two types of needs as follows:

Practical Gender Needs (PGNs)	Are the needs women identify in their socially accepted roles in society? PGNs do not challenge, although they arise out of, gender divisions of labor and women's subordinate position in society. PGNs are a response to immediate perceived necessity, identified within a specific context. They are practical in nature and often inadequacies in living conditions such as water provision, health care and employment.
Strategic Gender Needs (SGNs)	Are the needs women identify because of their subordinate position in society? They vary according to particular contexts, related to gender divisions of labor, power and control, and may include such issues as legal rights, domestic violence, equal wages, and women's control over their bodies. Meeting SGNs assists women to achieve greater equality and change existing roles, thereby challenging women's subordinate position.

Is the distinction between practical and strategic gender needs a useful one for development planners? According to Moser (1989), it is important for planners to understand the distinction because frequently, different needs are confused. Clarification helps in identifying more realistic parameters as to what can be accomplished through development planning, as also the limitations of different policy interventions.

e) Constraints and Opportunities

During gender analysis, it is useful to inventorise the constraints and opportunities for achieving greater gender equality in the socio-economic environment. In other words, planners must consider what factors most affect development in the area.

These factors can either support or constrain development in the area. They may also influence gender relations and the position of women workers. They can be considered at the macro, sectoral and micro levels as appropriate. They include:

- i) **Economic Conditions**, including
 - Poverty level
 - Income distribution
 - Inflation rate
 - International trade relations
 - Structural adjustment programs
 - Work opportunities
 - Technology
- ii) **Social Conditions**, including
 - Education and training levels of the population
 - Health
 - Demographic conditions, such as fertility rate, labor supply, international and national migration patterns
 - Prevalent norms and values, including cultural, religious and ethnic

iii) Political and Legal Conditions, including

- At the local, national and international levels
- Legislation and regulations
- National development policies
- Power and leadership patterns in the community
- Patterns of distribution of benefits

iv) Institutional Arrangements, including

- The nature and extent of government agencies, employers and workers organisations, other NGOs, community or women's groups
- The capacity of government and NGO constituents and other partners, including:
 - The type of organization, major areas of intervention and general capacity to plan and implement activities
 - The nature and extent of policies on, and experience with, women workers' issues
 - The organizational structure to address women workers' issues
 - Perceptions on and concern with gender equality in the organization

In assessing the socio-economic context, it is useful to identify the extent of direct and indirect gender discrimination.

- **Direct Discrimination** occurs when formal, legal and religious rules and regulations prohibit women from participating in activities equally. For example, the Civil Code may restrict women's rights to enter into legal contracts. The existence of discrimination is called **de jure** discrimination.
- **Indirect Discrimination** occurs when social rules, norms and values inhibit women's equal participation in activities. For example, employers may tend not to hire women for jobs considered to be "men's jobs", even where the law stipulates equal opportunity between men and women in employment. Such **de facto** discrimination is widespread and particularly difficult to combat.

f) Gender Roles

Gender Roles are learned behaviors in a given society/community or other social group that condition which activities, tasks and responsibilities are perceived as male or female. Gender roles vary considerably across settings and also change over time. Factors such as age, class, race, ethnicity, religion and other ideologies, geographical environment, economic environment, and political environment can shape and change gender roles.

▪ Types of Gender Roles

The concept of gender roles has been developed from the work of Moser (1993). She explains this concept as follows:

Gender planning recognizes that in most societies low-income women have a triple role: women undertake **reproductive, productive, and community managing** activities, while men primarily undertake **productive and community politics** activities.

Reproductive Role	Childbearing/rearing responsibilities, and domestic tasks done by women, required to guarantee the maintenance and reproduction of the labor force. It includes not only biological reproduction but also the care and maintenance of the work force (male partner and working children) and the future work force (infants and school-going children).
Productive Role	Work done by both men and women for pay in cash or kind. It includes both market production with an exchange-value, and subsistence/home production with actual use-value, and also potential exchange-value. For women in agricultural production, this includes work as independent farmers, peasant wives and wage workers.
Community Managing Role	Activities undertaken primarily by women at the community level, as an extension of their reproductive role, to ensure the provision and maintenance of scarce resources of collective consumption, such as water, health care and education. This is voluntary unpaid work, undertaken in 'free' time.
Community Politics Role	Activities undertaken primarily by men at the community level, organizing at the formal political level, often within the framework of national politics. This is usually paid work, either directly or indirectly, through status or power.

- **Multiple Roles**

Both men and women play multiple roles. The major difference, however, is that

Men typically play their roles sequentially, focusing on a single productive role, while **Women** must usually play their roles simultaneously, balancing the demands of each within their limited time constraints

The gender-based division of labor ascribed in a given socio-economic setting determines the roles that men and women actually perform. Since men and women play different roles, they often face very different cultural, institutional, physical and economic constraints, many of which are rooted in systematic biases and discrimination.

Is the concept of gender roles useful in development planning and practice? According to Moser (1993), it provides planners with the first key principle for a gender planning methodology that enables them to translate gender-awareness into a tool for planning practice.

9.1.2. DEFINITIONS OF CONCEPTS OF GENDER

The Office for Women (2005) has reported the following concepts of gender. Understanding of these concepts make easier for undertaking useful gender analysis of a given development program or project.

Gender/Sex — **Sex** commonly refers to the biological differences between men and women, while **gender** refers to the socially constructed roles and responsibilities of women and men. Gender roles are learned behaviors that affect which activities, tasks and responsibilities are appropriate for women and for men. Gender roles are changeable over time, and have wide variations within and between cultures.

Gender Equality — the concept of equality has evolved over time. Initially, gender equality meant treating everyone the same, regardless of their individual or group circumstances ("formal" equality and "gender-neutral" approach). Over time, gender equality has evolved to reflect a concern for arriving at equitable conditions for women and men, rather than with treating women and men as if they were the same. It is important to acknowledge that women's concerns regarding equity are most often

driven, not by the desire for equality with men, but by community based issues and fundamental human rights.

Gender Equity — is the outcome of being fair to women and men. To ensure fairness, measures must often be available to compensate for historical and social disadvantages that prevent men and women from operating on a level playing field. Equity leads to equality. A society that fosters gender equity benefits everyone in the long term.

Gender-neutral Analysis — assumes that policies/programs/projects affect all people in the same way, or that a policy/program/project has a neutral impact on people. Gender-neutral analysis does not result in equitable outcomes for women and men. If you adopt a gender-neutral approach, you will unintentionally perpetuate existing inequities in the lives of men and women.

Gender and Cultural Analysis – broadens the ‘gender based’ framework to include and reflect the multidimensional experiences of women, and of women from culturally and linguistically diverse backgrounds. All discussions about equality, equity or disadvantage must be inclusive of discussions about diversity and human rights.

Gender Analysis — recognizes that, to the extent that a policy/program/project has an impact on people, it will very likely have different impacts on women and men because they have different roles in society. Gender Analysis identifies differences in the social situations of women and men, and designs policies/programs/projects sensitive to these differences. Its purpose is broader than equal opportunity, which has as a goal increasing women’s participation in places where they are under-represented.

9.1.3. WHY DO GENDER ANALYSIS?

We often use the word "**gender**" as a synonym for "**sex**". In 1998, the International Development Research Center (IDRC) stated that **Sex** refers to biological characteristics that make someone female or male. Gender has also been misused as a synonym for "women" or "female." Development projects directed toward women's needs, for example, may mistakenly refer to gender needs. Instead, **gender** refers to the socio-cultural construction of roles and relationships between men and women. In describing socio-cultural construction, gender analysis considers other social structures such as race, ethnicity, class and caste.

Agenda 21 of the IDRC stated that Sustainable and equitable human activity depends on men and women's control of their own social and economic progress, on equitable access to knowledge, and on an indigenous capability to generate and apply knowledge (UN, 1992).

Gender Analysis is a systematic method for ensuring that gender considerations form part of the policy planning exercise. It should be acknowledged that there will be particular issues that will impact upon and be experienced by women of different cultural and socio-economic backgrounds in different ways. The framework to identify, analyze and respond to these issues should reflect and respect this fact.

Gender Analysis builds on the National and State Government’s commitment to fairness and equality for all the citizens (men and women). It helps guarantee that the government fulfils commitments to non-discrimination and equal opportunity (equal opportunity for women in its constitution and international conventions). Thus, Gender Analysis offers an approach intended to result in equitable outcomes for men and women.

Gender differences are hierarchical and are interlocked with class, caste, race, ethnicity and other hierarchical social relations. Gender equality is therefore central to

development. First, the increasing “**feminization of poverty**” requires the empowerment of women as a key strategy for poverty reduction. Second, in the long-run, an increase in the productivity of women will have a positive effect on the sustainability of economic growth and development as prescribed by the United Nation’s Millennium Development Goals (UNDP, 2000). Sustainable and equitable development gives overriding priority to meeting the basic needs of the world’s poor; and it emphasizes social equality between all peoples now, as well as a responsibility to future generations (UN, 1992). In some cases, gender equality will require strengthening the place of men and boys. As a rule, the reduction of gender inequalities requires a joint effort by women and men.

Not all projects have to be “gender projects,” or, in other words, address gender as a primary theme; however, all projects should be “**gender smart.**” Gender smart means that gender equality is addressed in project analysis and acted upon accordingly in project implementation. The project teams should ensure that in their project implementation plan:

- Gender equality is explicitly considered in the analysis underlying the rationale for the choice of project focus and implementation approach;
- There is an awareness of the resources available to strengthen gender equality;
- Project design clearly reflects a gender-nuanced analysis; and
- Gender-analysis conclusions are actually integrated into the project implementation strategy.

Gender equality means that women and men have equal conditions for realizing their full human rights and potential to contribute to national political, economic, social and cultural development and benefit equally from the results. **Equality is essential for human development and peace.** Attaining gender equality demands recognition that current social, economic, cultural, and political systems are gendered; that women’s unequal status is systemic; that this pattern is further affected by race, ethnicity and disability; and that it is necessary to incorporate women’s specificity, priorities and values into all major social institutions (Status of Women Canada, 1995).

Why gender analysis? ILO’s and World Bank’s analytical works in gender and development attempts to document the **benefits of paying increased attention to gender in development programming.** They also tried to demonstrate the **costs of neglecting attention to gender.** The list below selects a few of the key findings:

- **Gender inequalities hamper socioeconomic growth.** This is the main message of the World Bank’s official report to the Fourth UN World Conference on Women in Beijing, *Toward Gender Equality: the Role of Public Policy.* The report describes the causal pathways through which gender inequalities in society can threaten the success of development policies and programs (World Bank, 1994, 1995).
- **Public policy can play a role in reducing gender inequalities.** The same World Bank report goes on to describe why public policy can reduce gender inequalities. Such inequalities represent a form of “market failure”, which can be rectified by policy interventions. Since reducing gender inequalities results in positive externalities, public policy has an important role to play in removing these inequalities (World Bank, 1994, 1995)
- Much of the analytical work quantifies the **private and social returns to girls’ education as compared to that of boys.** It finds that while the **private returns** to education are high for both boys and girls, the **social returns** to girls’

education exceed those for boys' education, especially at the secondary level. Some of these social returns are summarized as follows (ILO, 1998):

- Educating women reduces national infant mortality
 - Educated women have healthier children
 - Educating women reduces national fertility rates
 - Educated women have fewer children
 - Educating women reduces national maternal mortality
- Analysis has also examined the **relationship between higher levels of human capital and inputs for women farmers and agricultural productivity**. Findings suggest that raising the level of human capital and inputs of women farmers to that of men farmers can result in significant increases in yields by women farmers (ILO, 1998).
 - Another example of analytical work demonstrating **the costs of neglecting attention to gender issues in development comes from work on violence against women**. Estimates show that the global health burden of some forms of violence against women ranks with public health concerns such as tuberculosis, cardiovascular disease, HIV and cancer (ILO, 1998).

9.1.4. GENDER-EQUALITY ANALYSIS

The University Partnerships in Cooperation and Development, UPCD, (2006) and the Women Canada (1995) have recommended that the four-step tool below can assist project teams in doing a gender analysis so that gender equality is appropriately addressed in their project. This checklist is mainly based on a checklist used by non-governmental organizations (NGOs).

a) **Gender-Equality Analysis Tool**

Step 1: Data Collection. This section should describe:

- The differential political participation and decision-making of women and men in the project area;
- Differential access to and control over resources between women and men;
- The differential perspectives, roles, needs and interest of women and men;
- The cultural constraints and disadvantages affecting women or men; and
- The consultative exercise(s) carried out with the disadvantaged gender group affected by this project.

Common sources of information for gender analysis could be interviews with people in the project area, the team's experience in the area as well as existing documents.

Step 2: Identification of Issues

Based on the data collection, identify specific obstacle(s) to men or women gaining equal access to the benefits of the project.

Step 3: Identification of Strategies to Promote Gender Equality

Describe a strategy for dealing with the obstacle(s) identified above so that women and men would not be prevented from enjoying equal access to the benefits of the project.

This strategy should identify "entry points," which would allow obstacles to the full participation of women and men to be addressed and effective actions to be taken.

Step 4: Formulation of Gender-Equality Results

Based on the strategy and entry points identified above, identify the activities, outputs, outcomes and indicators that are specifically meant to ensure that the disadvantaged gender group is not excluded from the benefits of the project. These should be included in the project implementation plan and reported on accordingly.

b) Planning for Women's Participation in Project Activities

While gender equality applies to both men and women, typically it is women who have been excluded from development processes. This subsection therefore addresses planning for women's participation in project activities.

It is not enough to simply target women as beneficiaries to be included in project activities. Even though project activities may include women, there are factors both internal and external to a project that will influence, first, whether women **can** participate in project activities and, second, whether women **will** participate. The following questions will help teams to encourage women's participation in project activities.

i) Are women included in project design?

- Have women been included in:
 - The statement/definition of the problem addressed;
 - The preparation of the project proposal;
 - The project team/management structure;
 - All levels of decision-making?
- Is there a budget line for gender activities?
- Are all project members sensitive to gender issues?

ii) Can women participate in project activities?

Socio-cultural barriers to women's participation can present a risk to projects' gender - equality objectives and thus need to be identified and addressed. These barriers may include:

- Women's lack of authority in households and communities;
- The social value of women's lost labor;
- Women's lack of mobility;
- Women's level of literacy and education;
- Women's lack of confidence or self-esteem.

iii) Will women participate in project activities?

Once it has been established that women can participate in project activities, a number of factors determine whether they will, such as:

- Perception of benefits from participation;
- Attitudes of project workers toward women;
- Role models of participation in the project team itself;
- Scheduling of activities to suit women's responsibilities;
- Language and communication barriers.

c) Gender-Equality Checklist for Project Design

Once project teams have completed a gender analysis and determined the implications for their project implementation plan, they may want to use the checklist below to review whether gender equality is adequately addressed in all aspects of their project plan.

Project Description

- Does the project description highlight the relevance and contribution of the project to the gender-equality goals of the country and local community where the project is going to be undertaken?
- Does the project description speak to the relevance and contribution of the project to the gender-equality policy and goals and other priorities of the project?
- Have both women and men been included in the definition of the problem being addressed?
- Does the project description include how women and men in the project's partner institution will be involved in developing the partnership, networks and collaboration with stakeholders?

Project Methodology and Management Strategy

- Does the proposed project methodology demonstrate how gender analyses – including an analysis of the role gender dynamics play in the development problem – have been employed in framing the project objectives and goals?
- Does the proposed project methodology include activities or programs for both the project's partners that highlight gender-related components and their intended results in promoting women's participation and equality between men and women?
- Does the project management strategy include ways to promote gender equality and women's active participation and leadership in the management, implementation and monitoring activities?
- Does the project methodology and management strategy of the project make reference to the importance of doing social needs assessment or environmental/organizational impact assessment that takes into account gender differential needs and impacts?
- Do the proposed project methodology and management strategy include gender-related risks? Do they specify how the project intends to address them?

Institutional Background

- Does the description of the institutional background of the project's partner institution(s) include a reference to their commitment to gender-equality goals, available gender-related expertise, and previous international cooperation experience that involved gender-related projects and programs?
- Does the description of the institutional background of the project's partner institution(s) include a reference to their commitment to gender-equality goals, available gender-related expertise, and previous international cooperation experience that involved gender-related projects and programs?

Project Team Structure

- Does the project team structure include women leaders in both the project and the partner institutions?
- Does the project team structure include the designation of a special team involving both women and men that will implement and monitor the gender-related components of the project?

Results-Based Management

- Does the description of expected results, in terms of project outcomes and long-term impacts, or changes that may arise from the project, include reference to gender-related outcomes and impacts?
- Do the performance measurement indicators include both quantitative and qualitative gender-sensitive measurements to assess whether the intended results are being achieved?
- Do the expected results stipulate the number of women and men who would benefit from the project at the university and community levels?
- Do the performance measurement indicators use sex-disaggregated baseline data to enable monitoring and evaluation of gender-related changes over time?
- Does the gender-equality analysis framework identify critical assumptions that highlight a realistic appreciation of the factors, conditions or circumstances that would affect the achievement of desired gender-related outcomes and results of the project?
- Does the mention of risks (both internal and external) that might be political, cultural, social, economic or environmental in nature indicate how the critical assumptions necessary for positive gender-related results may or may not occur?

Budget

- Have sufficient funds been allocated in the budget to implement and monitor the project gender-equality strategy?

9.1.5. GOALS OF GENDER ANALYSIS

The Office for Women (2005) has set five major goals of a gender analysis. These are:

- To ensure better targeting of policies and programs.
For example, for women to take full advantage of employment training programs, assistance with childcare and transport may be necessary.
- To broaden the focus of economic analysis to inspire different questions to be asked and issues to be raised.
For example, the assumption that there is sharing within a household may obscure how or whether intra- family income distribution occurs. This will have implications for planning around family-targeted benefits, including unemployment benefits.
- To enable agencies to analyze systematically whether the outcomes of policies or services are equitable.

Ethiopia is a signatory to a number of international covenants endorsing gender equity. The United Nations Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) is a good example. Governments are required to report on initiatives to implement this convention every four years. National and state legislation also endorses non-discrimination. Gender Analysis helps everyone to meet this goal.

- To improve the accuracy of costing and projections in relation to uptake of programs or benefits.

For example, accurately predicting the need for employment and training programs or various family support services such as childcare and elder care requires consideration of information on underemployment. There are many more women than men in part time jobs. Many of these women would prefer to work more hours if it were available and/or if it were possible to balance full-time work with domestic responsibilities.

- To ensure maximum participation by women, increasing benefits to society from women's skills.

City administrations work hard to develop the skills of women to help them obtain work. Currently construction, food processing and horticulture training are offered as part of community service.

It is often assumed that women will not be suitable for this work because it creates difficulties for women with household and child care commitments. However consultation with women participating in the training and undertaking training identified it as a most productive community service activity. However, the time schedule should be convenient to the trainees and trainers.

It is important to note that women are not a homogenous group. As a result, it may well be necessary to consider race/ethnicity, sexual orientation, disability and/or economic status in assessing the situation of particular women. It is also essential to recognize the complexity of identity, and the diversity of all peoples that include land/country, colonial histories, rural/remote/urban, life experiences, cultural knowledge, kinship and languages.

Although women have more opportunities and choices than they had in the past, statistics show that there are still significant differences in their roles and responsibilities. For example:

- Women still earn less than men;
- Women are still primarily responsible for unpaid domestic responsibilities;
- Research into women's health needs still lags far behind men's; and
- Domestic violence is an issue for many women.

The social and economic differences between men and women mean that government policies and programs do not always affect women and men in exactly the same way. Therefore, programs, policies and projects that do not consider gender may fail to have the desired outcome, resulting in wasted time, money and effort.

9.1.6. THE CONTEXT OF GENDER ANALYSIS

Gender analysis examines the differences in women's and men's lives, including those which lead to social and economic inequity for women, and applies this understanding to policy development and service delivery is concerned with the underlying causes of these inequities aims to achieve positive change for women.

The term 'gender' refers to the social construction of female and male identity. It can be defined as 'more than biological differences between men and women'. It includes the ways in which those differences, whether real or perceived, have been valued, used and relied upon to classify women and men and to assign roles and expectations to them (Ministry of Women's Affairs, 2004). The significance of this is that the lives and experiences of women and men, including their experience of the legal system, occur within complex sets of differing social and cultural expectations.

Bartle (2008) suggested that a gender analysis should recognize the following issues:

- Women's and men's lives and therefore experiences, needs, issues and priorities are different
- Women's lives are not all the same; the interests that women have in common may be determined as much by their social position or their ethnic identity as by the fact they are women
- Women's life experiences, needs, issues and priorities are different for different ethnic groups
- The life experiences, needs, issues, and priorities vary for different groups of women (dependent on age, ethnicity, disability, income levels, employment status, marital status, sexual orientation and whether they have dependants)
- Different strategies may be necessary to achieve equitable outcomes for women and men and different groups of women
- Analyses aim to achieve equity, rather than equality.

Gender equality is based on the premise that women and men should be treated in the same way. This fails to recognize that equal treatment will not produce equitable results, because women and men have different life experiences.

Gender equity takes into consideration the differences in women's and men's lives and recognizes that different approaches may be needed to produce outcomes that are equitable.

Gender analysis provides a basis for robust analysis of the differences between women's and men's lives, and this removes the possibility of analysis being based on incorrect assumptions and stereotypes.

9.2. UNDERSTANDING GENDER IN DEVELOPMENT

The significance of incorporating gender perspectives in community development programs lie in the fact that decision-making processes always start at home and at the individual level. Power structures notwithstanding, most of the decisions at the household level are taken by women, and directly affect the household to which she belongs. Also, benefits accrued from education and awareness building programs targeted at women, are ploughed back to the family and household.

But dilemmas with respect to gender issues do exist - Do we look for gender specificity or look at human dimensions? Do we work on gender stereotypes, or work on new/emerging roles? Is there a difference/distinction in the way women collect, process and use information and in the way they take decisions? Should gender studies be separate or should be mainstreamed? Should it be 'gender' and environment or 'women' and environment? Should 'Gender' focus on women, on men, or on both?

According to Weldemedhin (2003), the three corners of a gender policy relate to (1) creating the right conditions for the delivery of a variety of resources to support empowerment of women, especially where they have a say on the type and mode of delivery of resources of their choice; (2) the provision of cost-effective and complementary services - for example, training and gender sensitivity workshops, covering all issues of economic, social, cultural and other aspects, that leads to empowerment, and (3) mainstreaming of gender issues within larger developmental policies, which may call for a in-depth review of norms and regulations from a gender perspective, identifying empowerment indicators for a program or policy, etc.

The Global Development Research Center, GDRC, (2008) and Bartle (2008) have further discussed the role of gender analysis for national development with respect to:

- Gender analysis,
- Information and knowledge,
- Participation and decision making,
- Legislation, rules and regulations,
- Organizational balance,
- Capacity building and training, and
- Resource provision as follows:

9.2.1. GENDER ANALYSIS

A thorough gender analysis is a critical starting point for any program or project that aims to be more gender sensitive. Questions such as the difference in impacts of the policy/program on women and men; the advantages and disadvantages; roles and responsibilities; who does what, who has what, who needs what; strategies and approaches in closing the gap between what men and women need; etc. need to be asked and analyzed in building a comprehensive picture of the existing situation. This will identify the lacks (that which is not there), gaps (that which is not enough) and mismatches (that which is not right).

9.2.2. INFORMATION AND KNOWLEDGE

Key to developing a comprehensive gender framework is the effective management of information and knowledge. Attention needs to be paid to the **collation**, **packaging** and **dissemination** of information - the right information, at the right time, at the right level, to the right person, so that the intended and right decision can be taken. All three stages of the information management continuum - collation, packaging and dissemination are therefore critical. Issues that need to be kept in mind for collation include - who has the information, what is the quality and quantity of the information available, what format is the information in; for packaging include - how will the information be used, what format should it be in, what decisions and actions are expected from the information provided, who is the user of the information; for dissemination include - what is the best media to use for reaching the intended target group, how can the dissemination facilitate long term capacity building, etc.

9.2.3. PARTICIPATION AND DECISION-MAKING

As mentioned above, the household is the smallest decision-making units in a society, where decisions are taken daily - those not only affects the household itself, but cumulatively have a long-term and global impact. As the slogan "**Think Global, Act Local**" extols, it will be the effective action taken at the local or micro level that will have maximum impact. Effective involvement of all levels of decision-making, particularly at the household level will ensure that decisions taken at the macro level will have its intended micro impacts. The participation of women in all decision-making processes - whether micro or macro - will ensure that broader goals are achieved, and will benefit all sections of the society.

9.2.4. LEGISLATION, RULES AND REGULATIONS

A comprehensive set of legislation, rules and regulations at the national and local levels - that address short, medium and long term issues are important, but so is its implementation. Both women and men need to be made aware of the protection and provisions made under different legislation, rules and regulations. These cover remedial, preventive, and management strictures that aim to create a gender-balanced society. **Effective legislative frameworks in fact lie at the core of good governance.**

9.2.5. ORGANIZATIONAL BALANCE

Maintaining a gender balance within any organization - in the public or private sector - is critical to ensure that concerns and needs of both women and men are taken into account in decision-making and implementation. Day-to-day operations of an organization, whether a local government, a business, a company or a school or university, need to benefit all its members. This is done through conscious and stated policies, regulations, and/or management practices.

9.2.6. CAPACITY BUILDING AND TRAINING

Despite well intended policies, legislation or practices, achieving a gender balance in meeting needs and concerns of both women and men does not just happen. There is a clear need for better capacity building and training to be undertaken to increase the viability and effectiveness of gender policies and programs remedy the situation, as well as proactively prevent discrimination and bias from happening. Gender sensitivity has to be built in both women and men, particularly in those who are in positions of decision-making.

9.2.7. RESOURCE PROVISION

Dismantling decades and even centuries of gender discrimination is not an easy task and requires the elimination of deep-rooted bias with both positive and negative reinforces. Access to markets, information, finance, skills and other resources need to be provided to women in order to be able to play in a level playing field. These can come in the form of specially targeted programs and provisions, or better and open access to existing ones. This is particularly true in the case of access to financial resources, and access to markets and information for the products they produce or services they provide.

9.3. METHODS TO RAISE GENDER AWARENESS AND PROMOTE GENDER BALANCE

The Hon, Mary Nagu, Minister of Community Development, Women Affairs and Children, for the Democratic Republic of Tanzania, said, "You can not have genuine community development without gender balance, and the most important element in reaching gender balance is through community participation" (UN, 1996).

Community work is a useful channel for raising awareness about gender issues, and for balancing some inequities. Conversely, community work would be incomplete without raising gender awareness and promoting gender balance. Bartle (2008) has interpreted methods to be employed for raising gender awareness and promoting gender balance within a community in relation to the following major issues:

- Gender vs. Sex,
- Human rights issues,
- Economic and political issues,
- Cultural issues,
- Awareness raising,
- Promoting gender balance, and
- Main streaming gender.

9.3.1. GENDER VERSUS SEX

A few hard-line advocates of sustaining oppression of women argue that the word "gender" is not a legitimate word, created solely to promote a movement to upset traditional social structure. This is incorrect, and it will be useful for the mobilizer to know some things about the word "gender," why it is used, and its importance in capacity development, income generation and the empowerment of low-income communities.

A good start is to distinguish between the words "sex" and "gender."

Roughly, "sex" is biological and "gender" is social. Biological characteristics are transmitted and sustained over the generations through genes (and sexual reproduction) while social characteristics are learned and transmitted and sustained (by symbols not genes) through communication and learning (social reproduction).

The major distinction in sex differentiates between "male" and "female," while the major distinction in gender, as in grammar, is between "masculine" and "feminine." (Genetic research reveals that we may have more than two sexes, perhaps as many as five different combinations of X and Y chromosomes and their related genes).

What constitutes "masculine" or "feminine" is very variable, and differs from culture to culture, and differs from era to era in history. What this implies is that the social attributes (masculine and feminine) that (as humans) we apply to different people, in response to their biological characteristics, are culturally arbitrary, and can be changed in a process of development or other social change.

(Our biological characteristics are determined largely by our genetic inheritance, and can be changed, with more difficulty, through surgery, medications, or other physical means).

9.3.2. THE HUMAN RIGHTS ISSUES

While values vary from community to community, country to country and time to time, we can accept that there is a general consensus about right and wrong in some very broad concepts.

Racism is one such broad concept, and it is generally considered to be wrong, even though it is possible to identify some persons who hold racist values. The essential belief in racism is that some people are characterized by some physical attributes (skin color, hair, bone structure), and the racist believes that those physical attributes confine people to a category, and that some social, psychological, cultural and other non-physical characteristics would automatically apply to all in that category. Typical racist beliefs and stereotypes include (1) "All Negroes are musical," (2) "All Whites are racists," (3) "All Jews are shrewd with money," or (3) "Certain peoples are untrustworthy, sexually promiscuous, stingy, illogical, or power hungry," – and on, and on.

These stereotypes are often cited to justify treating some peoples in some selected, unfavourable and discriminatory way, or to justify laws being made that restrict their full participation in civil life. When analysed, it becomes obvious that **sexism is essentially the same as racism**. It is the stereotyping of non physical social characteristics, and behavior towards, categories of people having some biological characteristics.

If we look towards international agreements such as the Declaration of Human Rights, we can find the broad values towards which we work. Among them is the idea that everyone is entitled to services, opportunities, treatment by law, or access to civil participation, regardless of race, gender, religious beliefs and practices, or other categories that tend to divide up the one human race.

We know, however, that in the low income and poorly educated communities, these values are not shared, and often are not even known. That puts a burden of responsibility onto the community mobilizer and the facilitator of capacity development; to make these values known and understood, and to work, as change agents, towards implementing these universal values, as part of the mobilization process.

9.3.3. THE ECONOMIC AND POLITICAL ISSUES

All human individuals can contribute to their society and community, in varying ways and varying amounts. Community and society are strengthened by those contributions, because of, not in spite of, those variations.

If it is the habit of a group of people to systematically exclude about fifty per cent of its population from productive activities, then the output of its economic activities suffers from the loss of fifty per cent of its potential inputs. Because of the multiplier effect, if those fifty per cent of inputs are added, the output will be far more than fifty percent increased, perhaps increased by five times as much. **The exclusion of half the population on the basis of their sex does far more than fifty per cent damage to the economy**. It makes good economic sense to include women and men equally in the economic productivity of any society or community.

Similarly, if it is the habit or a group of people to systematically exclude fifty per cent of its population from making political decisions (i.e. decisions that affect the whole community or society), then the whole range of possible decisions is reduced. The vision that a society or community has of its own future and its own possibilities is limited. Value is lost. It makes good political sense to include women equally in the political decision-making process of any society or community.

Another way to see and understand that loss is to consider what it would be like if men were to be systematically excluded from economic activity or political decision making. There is no scientific reason for assuming that men's contribution is better or greater in any way than women's contribution.

Persons who are systematically excluded (e.g., women) from participating fully in the political system and the economy constitute a valuable resource that should not be neglected or overlooked in the development of an organization, community or society. Without them poverty will be greater.

A community will be politically and economically stronger, more varied, more creative, more productive, and more equitable, if both men and women are given equal opportunities to participate in its economic and political life.

9.3.4. THE CULTURAL ISSUES

At a community workshop being facilitated by two young women from the Uganda Ministry of Gender (on behalf of our community empowerment program), I heard an old man cry out, "**Are you trying to kill our culture?**" He was convinced that it was traditional, and culturally justified, that women consider all men to be superior to them, that women should not be involved in communal decision making, and that women's role was to serve men. "No," replied the young woman at the front of the meeting, "We are not trying to kill our own culture," "We want to strengthen its best parts and to leave behind those parts which are no longer useful" (Bartle, 2008).

You, as a mobilizer need an answer to those who argue for the preservation of their culture, those who fear that if you change a few customs and attitudes then you will destroy that culture.

Start with an understanding of what is culture. Culture is a living thing (organism), social rather than biological. It consists of all things (attitudes, behavior, and beliefs) that are learned rather than genetically inherited. To remain living it must grow and adapt, just like biological organisms. Growing and adapting mean changing.

Anything which is preserved — is dead. Sardines must die to be preserved in a can... Pickles inside a preserving jar are dead. Artifacts in a museum are dead. They are unchanging, which is the objective of preserving them.

We as mobilizers should respect and honor y/our traditions and cultural heritage. We see our culture as a living thing, however, not one which is dead (unchanging) like the Latin language. For our respected culture to survive, however, it must grow and adapt; it must therefore change to meet the new times, i.e. the changing world environment.

Change is inevitable. If there must be change, then it is better to have some influence over the direction of that change rather than have it all culturally determined without our participation. If our laws must change, then better they change towards the universal declarations of human rights than towards the law of the urban jungles.

In the short run, balancing gender participation may appear to be going against tradition, especially where women had been oppressed in the past. In the long run, in contrast, the equal participation of both men and women will contribute to stronger society and communities, and therefore to the strength, growth, and survival of our culture.

The above four subsections (9.3.1 – 9.3.4) were explaining the social and cultural nature of gender and the need to improve gender balance to strengthen society and its communities. The following three subsections (9.3.5 – 9.3.7) direct you towards forming your own strategies, as a mobilizer, for helping and guiding communities in reaching more gender equity and fairness.

9.3.5. AWARENESS RAISING

We can not solve a problem if we do not know it exists. Remember that the members of society and community must solve their own social and community problems. As in all community development, you do not develop a community, the community develops itself. Your intervention, including guidance, stimulation, training and encouragement, may provide some direction, but the **changes need to be made by the members.**

Many members do not see that there is a problem to be solved, or do not want to see it. Many members benefit from an unequal status quo and feel threatened by any changes that might lower their status, prestige, power or their economic advantage. Those, with such vested interests, will say that there is no problem, or argue that modifying traditional practices and beliefs will destroy the culture.

Advocacy, raising awareness and sensitizing the whole membership of the community are the approaches to be followed to let the members see that there is a problem and/or solicit the support of those who believe that they might lose something by the change. The second, dealing with vested interests will be included in the following section.

The process of raising awareness among a targeted audience is one that is best approached by participatory methods.

Remember that we learn least by listening, a bit more by seeing it done, and most by being involved- by doing. Remember that community members will take more responsibility for a project if they make the decisions to undertake it, that they do not feel it is imposed on them from outside. They must "own" the process or project. These are the basic community development principles.

Your elemental method, then, is (in group sessions) to ask questions, like Socrates. Do not preach, harangue or lecture the participants. Ask them questions that lead them to looking at the situation, their own community, in terms of gender balance as it exists and as it could be.

It would not hurt, however, to meet privately with aware and sympathetic religious and other community leaders and opinion makers, and encourage them to do some preaching, lecturing or haranguing about the topic.

Questions about gender balance should not be restricted to special workshops dedicated only to gender (that marginalizes the issue, and often ends as preaching to the converted), but should be integrated fully with all management training and mobilization of the community to undertake its own community projects.

9.3.6. PROMOTING GENDER BALANCE

In the real world there are huge, non-defendable inequalities, where men are concentrated in some situations and women concentrated in other situations, generally unfavourable to women in comparison to men. **A goal of gender balance would be one where those huge inequities are corrected.** A strict quota of exactly fifty per cent for each and every situation would be too rigid, and working towards it might cause more problems than it would solve.

After seeing that a vision of gender balance is consistent with our highest values of human rights, as well as advantageous to our culture, including its political and economic systems, then we need to ask what methods we can adopt in order to work towards it. This is not the time to adopt a recipe approach, trying to apply a standard

formula of correction in all places. It is important to analyze each situation and determine a custom-made solution that is appropriate for each situation. Trujillo (2008) used a well known slogan in the context of this goal: "**Think globally – Act locally**".

When any social change is contemplated, you can find some people who are in favor of the change and some people who are opposed to it. This, for example, is a concern often raised about increased community participation.

Those persons opposed to a change are usually those who believe that they will lose something that they already have if the change takes place. Surprisingly, sometimes those who are at a disadvantage will oppose the change, and it is because they believe they will lose something, even if what they would lose might not seem valuable to you. Sometimes people, who are oppressed, enslaved, or imprisoned, do not want to lose those chains, because they see security and lack of need to take responsibility and make decisions as something they might lose.

The people, who see that they will benefit from the changes, as you would guess by now, are allies, or potential allies, of you and others who wish to make the changes.

Your strategies, therefore, are to demonstrate that the proposed changes will benefit everyone, including those who currently see that they might lose something. **Make the changes worthwhile to those who might oppose it, and they might withdraw their opposition, and perhaps even actively support the changes.** This sounds simple in concept, but is not necessarily easy to undertake.

Another parallel is in trade union organizing. By organizing a union all the members will benefit by getting better pay and working condition, but only if all or enough join the union.

One thing you know, as described earlier, is that the organization, community, or society will benefit by participation by both men and women. Removing restrictions on participation of any categories of people will mean the inputs (political, cultural, technical, and economic) will be more varied, richer, and more creative. This will empower the whole (increase its capacity), and all members will benefit. This will be easier to communicate to persons who are more socially and politically aware. **Therefore your sensitizing work, as mentioned above, should not dwell only on the inequities, but also demonstrate the benefits of increased gender balance to the whole and to each member.**

The principle is that an inclusive policy will be beneficial both to the whole (community, organization and society) and to the individuals who compose that whole.

9.3.7. MAIN STREAMING GENDER

A common strategy in many social change or developmental programs is to initiate the change in one area or sector, then, based upon success and lessons learned, main stream it to the whole society.

For your work (mobilizing communities, reducing poverty, facilitating capacity development of organizations, management training, and promoting self reliance) that approach to main streaming is not recommended. Main streaming gender awareness and promoting gender balance is best done right at the beginning of your work and should be carried on throughout.

The problem of concentrating on gender in selected sectors or areas at first, as mentioned above, results in the marginalization of the issues. If you organize a gender

workshop, you are more likely to attract only participants who are already aware of the problem and are in favor of solutions. If you include gender awareness and generating gender balance strategies as a specific topic in all your training sessions, and integrated with your other work, you are more likely to include persons who should hear the message.

The only time when it would be useful to have a workshop specifically concentrating on gender is when you are organizing a TOT (Training of Trainers) or when you are briefing your field staff or dedicated volunteers; then you need to concentrate on developing strategies rather than engaging in the awareness raising itself. In that case you are not implementing a gender strategy as such, but preparing your staff and allies in planning a gender strategy.

Meanwhile, in all your activities (mobilizing communities, forming groups, management training, capacity developing, poverty reduction), you need to integrate gender awareness and gender balancing. Main streaming should be included from the beginning.

9.4. PRESERVING CULTURE AND GENDER EMPOWERMENT

So you want to preserve your culture? Nice ideal. You might be surprised to discover, however, that you are a danger to your culture if you want to preserve it. Does that sound like a paradox? Not if you look carefully at what culture is, and how you can strengthen it. Do you want to empower your culture or do you want to preserve it? The choice is yours. Choose one only. You can not have both (Bartle, 2008). Bartle had also discussed on the following salient features of culture and gender empowerment.

9.4.1. CHARACTERISTICS OF CULTURE

Before we begin discussing the idea of preserving culture, let us first ensure we agree on the meaning of culture. The most elementary definition of culture is that it is composed of everything we learn.

Several scholars discuss on culture. All emphasize that culture is the socio-cultural system or society, that it is all our beliefs and actions that are not transmitted by genes. They are stored and transmitted by symbols. They include six dimensions: the technological, economic, political, institutional (interactional) dimensions, the cultural dimension of aesthetics and values, and our worldview or perspective on the nature of the universe.

The common, every-day, or street definition of culture is what we see in the social sciences is as one of the six dimensions, the aesthetic. Drumming and dancing in Africa, drumming and singing in aboriginal North America, ballet and opera in Europe, all of these are part of culture but not the whole of culture.

Since those traditional songs, dances and music are important elements in the identity of those who perform and enjoy them, we strongly support the idea of preserving them and adding to them, as well as increasing their presence and profile in all societies, and in increasing and expanding their content. **A strong sense of identity is a valuable element in the strengthening of communities and their culture.**

It is in the other dimensions, and other aspects of the values dimension, where preserving culture can cause damage to the strength of that culture.

9.4.2. CHARACTERISTICS OF PRESERVATION

Think of things we know that are preserved: butterflies in a glass case, leather on a purse, orange jam in a jar, lumber for building, insects in amber, and frogs in formaldehyde. They all have one thing in common, they were all once alive (or were parts of something alive) and are all now dead.

The process of preservation is one which modifies something so that it will last, so that it will not change, so that it will not live. To be alive requires something to move, to change. So if you want to keep something from changing for a long time, kill it. It will change eventually anyway no matter how it is preserved.

9.4.3. LET CULTURE GROW AND BECOME STRONGER

Culture is a living thing. It is formed of the symbols, meanings and behavior of people, but can live beyond the lives of those individual humans who carry it. It is like a living organism, although it is not biological. It transcends the biological.

I can not give you freedom. If freedom could be given, it could be taken away (according to the teachings of Lao Tzu, the father of Taoism) and then it would not be true freedom.

The empowerment training is aimed at fighting poverty and oppression, not the poor and the oppressed. The method aims to strengthen the communities of poor and oppressed people. For those communities to become stronger, they must change; therefore their culture must change. They must do it themselves; we can only guide and stimulate, but not do it for them or give it to them. Since culture is everything humans learn, the changes needed to become stronger require culture change. Growth is change (and so is decay). Let them grow.

A flower will grow if it gets enough water, sunlight, soil and minerals. It will not get taller if you pull it from the top. We can provide the water and minerals, perhaps, but it is the flowers (like the poor communities) that must do their own growing. Pulling it up by the top is like social engineering. Stimulating it by giving it water and minerals to grow and become stronger is empowerment methodology for flowers.

Many people believe in a mythological past where traditional culture was utopian. The evidence is different. The "good old days" never existed. No pre colonial community was unchanging. There was violence, there were wars, there were unfair things, and there were change and adaptation. We should not believe in an untrue past and try to preserve something that never existed. Then and now, strength, growth and survival required and requires change and assertiveness.

9.4.4. PICK AND CHOOSE

We said above that we encourage the preservation of songs, dances and music, because they enhance the sense of identity, an important factor of capacity development. But we think that some practices and values need to change if a community is to get stronger.

Think of culture as clothing for a moment. In fact, clothing is technology, part of our culture. We put on different clothing according to conditions in the environment. We do not wear a sleeping pajama for office. To grow and adapt to changing conditions, we must be able to wear different aspects of our culture in different conditions.

Another metaphor: think of culture as our means of transport. (Our means of transport is another technological aspect of our culture). We do not drive a four wheel drive jeep into the ocean for fishing. We do not ride in a fishing boat for car racing. We pick and choose

what is appropriate and effective. If some aspect of our culture is hindering us from surviving, growing and winning in the environment in which we now find ourselves, then we must don new cultural traits.

Some of those cultural traits are very honorable and praiseworthy, but if they cause us to weaken and die out, they need to be changed like a new suit of clothing or a new means of transport. If we say, "Oh we do not litigate and fight," and we are proud of that aspect of our culture, then when it comes time to fight and litigate for what is rightly ours, and we do not, we lose what is rightly ours.

If we say, "Oh we always respect and obey those who are in power," and if those in power are corrupt and evil, then we must either temporarily put aside that cultural trait or don a more useful set of traits. If we do not, then we will be exploited, robbed and oppressed by our conquerors or leaders.

We therefore should not say that we must choose the best of our traditional culture and preserve that. We should say that we must maintain our identity, but we must be able to adapt our values, our habits, our ways of thinking and acting, to use those which will make us stronger (not those which make us honorable but weak).

In modern post colonial Africa and Latin America, the poor countries of the world are living in environments which require changes in some cultural traits. We need to consciously choose those that are appropriate for making us stronger, for our own empowerment.

9.5. CONCEPTUAL ISSUES IN PROJECT PLANNING WITH A GENDER PERSPECTIVES

Temba (2007) gave explanations on conceptual issues that are related to project planning from gender perspective. These are:

- Gender perspective
- Practical and strategic gender needs
- Planning with gender perspective
- Rational for planning with gender perspective

9.5.1. A GENDER PERSPECTIVE

A gender perspective involves an understanding of what gender is and applying gender analysis in all situations. A gender perspective is an outlook and a way of seeing a set of an insight which informs our understanding of people, the society and how they interact in terms of what men and women do when and why.

9.5.2. PRACTICAL AND STRATEGIC GENDER NEEDS

It is a necessity or compelling cause of a man or a woman based on either condition or position in a given community. There are two types of gender needs namely "Practical Gender Needs" (PGN) and "Strategic Gender Needs" (SGN). Practical Gender Needs are those necessities that emanate from the condition or the biological side of a human being while Strategic Gender Needs are those related to individual's position in a community, which can either be inferior or superior to the other sex. To attain SGN one has to overcome some institutional barriers inherent in an oppressive or a patriarchal system.

9.5.3. PLANNING WITH A GENDER PERSPECTIVE

Gender planning is a process of addressing gender gaps in an organization, projects, programs and planning processes in order to ensure that these processes take into consideration the gender needs of the targeted groups. It is a process that ensures that any planned change is gender informed in order to ensure that gender equity is attained. The process requires strategies to integrate gender concerns into organization objectives, outputs and activities. Planning with a gender perspective involves also developing a framework through which gender concerns shall be institutionalized.

9.5.4. RATIONALE OF PLANNING WITH A GENDER PERSPECTIVE

Planning with a gender perspective enhances the identification of gender based differences in access and distribution of resource and to predict how different members of a households, groups, organizations and societies will participate and benefit from planned interventions. The following are the rationale for planning with a gender perspective:

- (a) It helps planners to achieve the goals of effectiveness, efficiency, equity, and empowerment through designing policy reform and supportive program strategies.
- (b) Enhancement in developing training packages for sensitizing development staff on gender issues and training strategies for beneficiaries.
- (c) Assists in understanding social cultural and political factors that affect development activities and devise appropriate strategies to tackle them.
- (d) Planning with a gender perspective enables planners to understand a different role (who does what, when and where using which devices) in the society. This will enable one to understand for example, who has time constraint and labor bottlenecks in the implementation of a given development intervention. It shows how differences in roles and rights of both gender affects economic activities.
- (e) Planning is about resource mobilization and resource use, planning with a gender perspective helps to understand who has constraints in access and control of resources as well as who benefits. It can also assist in deciding to whom resources should be channelled.
- (f) Gender analysis gives a gender-desegregated data for identification and implementation of development programs, projects and other community, sectoral and national plans.

A simple rationale for planning with a gender perspective therefore is that, in any society, there are people of different characteristics and needs. Any planned intervention focuses on these people. In order to benefit the people, such interventions should have gender perspective hence the need for gender analysis in planning.

9.6. GENDER AND THE DEVELOPMENT PLAN

Mbillingi (1991) and Temba (2007) have discussed on expectations from an economic development from gender perspective and in turn the contribution of gender partnership in the economic development as follows:

9.6.1. WHAT IS “THE EXPECTED OUTPUT” FROM DEVELOPMENT PLAN(S)?

The successes of national plans are measured by the number of people, both men and women, who are able to meet their minimum basic needs. Two variables to measure the attainment of basic needs are the Gross National Product (GNP), amount of goods and services available for men and women as well as the distribution of GNP for each household which is in turn determined by the extent to which different households have access to goods and services to meet their basic needs.

Planning is a factor of two aspects, the resources and people’s development (Human Development). Other factors which support the two aspects are also discussed. It is well known that, planning aims at ensuring that, there is a balance in distribution of resources across various sectors of the economy through inter-sectoral linkages and investment distribution to both advantageous and disadvantageous regions and sectors.

Further more, planning ensures resource mobilization from various sources with an aim of re-distributing them for equal distributed growth and development. In planning, resources have to be balanced to cater for different needs of the people. Planning with a gender perspective will involve identifying both strategic and practical needs of both men and women. If the people are to benefit from any planned change in any sector of the economy, their practical and strategic gender needs have to be carried aboard by the planners at all levels of planning. Plans that are not people centered are bound to fail to attain the set up goals.

9.6.2. GENDER PARTNERSHIPS, RESOURCES, AND ECONOMIC GROWTH AND DEVELOPMENT

It is sometimes assumed by most development planners that households as well as other units for which they plan for are homogenous units which will automatically benefit equally from their plans (Temba, 2004). A household just like any targeted units in the planning process should always be taken as a heterogeneous unit where people have different needs and interests that have to be taken into consideration in planning. Failure to recognize this fact has posed a challenge on national plans in attaining the expected outcomes.

Gender development approach entails an unflagging search for equity between men and women when considering or implementing activity that has an impact on the life of a community and involves groups of people. This approach is based on the principle that no development activity be it technical, financial, administrative or political, is by itself neutral. Designers and managers of development plans have to convey their views on the roles and status of men and women, consciously or unconsciously reproducing their attitudes in the activities for which they are responsible.

Planning for development is about striking some balance between the scarce existing national resources with the increasing population for improving its living standards. Raising living standards can be done through improving education, health and equality of opportunity for accessing all essential components of economic development. Economic growth therefore is a prerequisite for this provision and hence the need for planning and more so planning with a gender perspective so that men and women can participate and benefit from control the scarce resources in relation to the population. The following framework adopted from African Development Bank (2002) on Gender check list in Agriculture can be used as a theoretical model for integrating gender in planning.

9.7. GENDER ANALYSIS FRAMEWORK

Gender Analysis Framework is a step-by-step tools for carrying out gender analysis, which help to raise questions, analyze information, and develop strategies to increase women's and men's participation in and benefits from the projects.

Gender Analysis Framework is concerned with a number of critical questions (FAO, 1997) such as (1) the development context or patters in an area, answering the questions: What is getting better? What is getting worse? (2) Women's and men's activities and roles in the forestry sectors, answering the questions: Who do what? (3) Women's and men's access to and control over resources, answering the questions: Who has what? Who needs what?, and (4) Program actions needed, answering the questions: What should be done to close the gaps between what women, and men need? What does development deliver?

The outputs and recommendations from a Gender Analysis can be used in a number of ways:

- Development of management plans to ensure that the contributions of both women and men are adequately recognized in determining access to and control over resources
- Development, or review, of policy to ensure sustainability through equitable participation of all stakeholders
- Profiling of stakeholders to develop an understanding of who the stakeholders are, beyond just gender, to other socially determined characteristics.
- Restructuring of activities and organizations to ensure equitable participation at all levels and in a diversity of functions by both women and men.
- Development of criteria for training selection or recruitment to ensure that women and men have equal opportunities to progress in their career and that there are both women and men working in diversity of capacities in the sector to work with the women and men of the other stakeholder groups.

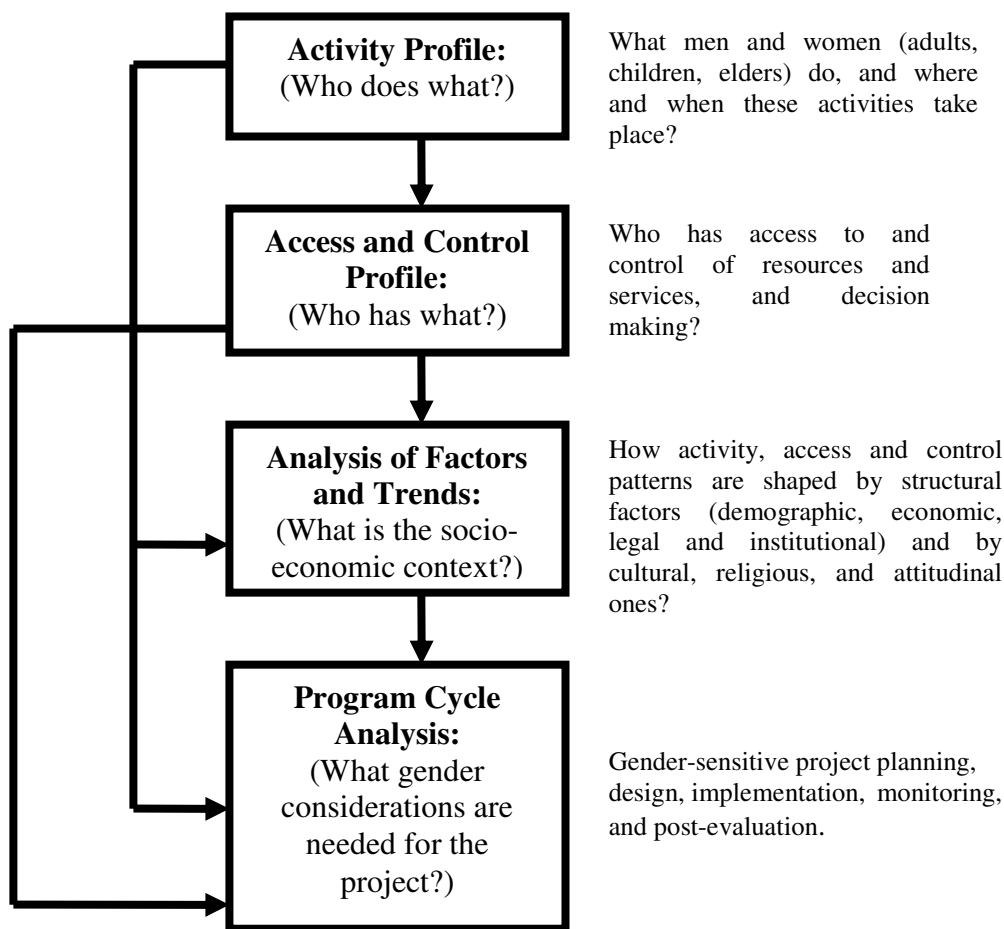
A typical gender analysis framework has four parts and is carried out in two main steps (ADB, 2002). First, information is collected for the Activity Profile and the Access and Control Profile. Then this information is used in the analysis of factors and trends influencing activities and access and control, and in the project cycle analysis.

9.7.1. ACTIVITY PROFILE

Who does what? What men and women (adults, children, elders) do, and where and when these activities take place. The planner needs to know the tasks of men and women in the population subgroups in the project area to be able to direct project activities toward those performing particular tasks. Therefore, data must be gathered on women's and men's involvement in each stage of the project cycle, on their shared as well as unshared tasks, and on the degree of fixity of the gender division of labor. The objective is to ensure that women are actively included in the project and are not disadvantaged by it.

The Activity Profile usually considers all categories of activities: productive, reproductive and community-related service. It identifies how much time is spent on each activity, how often this work is done (e.g., daily or seasonally), which periods are characterized by a high demand for labor, and what extra demands the program inputs will make on women, men, and children.

Figure 9.1. Gender Analysis Framework of Projects



Source: African Development Bank (2002)

The Activity Profile also identifies where the activities take place, at home or elsewhere (the village, marketplace, fields, or urban centers), and how far these places are from the household. This information gives insights into female and male mobility, and allows an assessment of the impact of the program on mobility, method of travel, travel time for each activity, and potential ways of saving time.

Issues considered under Activity Profile include:

- Production of goods and services
- Reproductive and human resource maintenance activities
- Community work
- Community organization and activities

9.7.2. ACCESS AND CONTROL PROFILE

Who has what? Who has access to and control of resources, and decision making?

The Access and Control Profile considers productive resources such as: land, equipment, labor, capital and credit, and education, and training. It differentiates between access to a resource and control over decisions regarding its allocation and use. It enables planners to consider whether the proposed project could undermine access to productive resources, or if it could change the balance of power between men and women regarding control over resources.

The profile examines the extent to which women are impeded from participating equitably in projects. For example, if women have limited access to income or land, they may be unable to join groups, which provide production inputs and commercial opportunities, or to become independent commercial producers. In some subgroups, men may also suffer the same disadvantage.

Program management mechanisms (e.g., the creation of water user groups or cooperatives) may determine who has access to and control over productive resources and may change existing gender relations.

9.7.3. ANALYSIS OF FACTORS AND TRENDS

What is the socio-economic context? How activity, access, and control patterns are shaped by structural factors (demographic, economic, legal, and institutional) and by cultural, religious, and attitudinal ones.

This analysis considers the structural and socio-cultural factors that influence the gender patterns of activity and access and control in the project area:

- Demographic factors, including household composition and household headship;
- General economic conditions, such as poverty levels, inflation rates, income distribution, internal terms of trade, and infrastructure;
- Cultural and religious factors;
- Education levels and gender participation rates; and
- Political, institutional, and legal factors.

The analysis should consider the following: Which policies and programs aimed at ensuring women's participation could affect the project? Which community norms and beliefs could influence women's participation in the project's activities? Are there laws or regulations that could affect women's participation in the project or their access to its benefits?

9.7.4. PROGRAM CYCLE ANALYSIS

What gender considerations are needed for the project? Gender-sensitive project planning, design, implementation, and monitoring and evaluation.

This analysis will indicate if and where the objectives and methods proposed for the project should be modified to improve the chances that the project will succeed and to minimize the likelihood that women will be disadvantaged as a result of it. Some questions that may need to be considered in this analysis deal with production processes, training, information, participation, access, institution building, project framework etc.

Particularly within the project framework, the following issues need to be considered:

- Do the planning assumptions (at each level of the planning framework or logical framework, for example) adequately reflect the constraints on women's participation in the program?
- Do project performance indicators identify the need for data to be collected, disaggregated by gender? Will changes in the gender division of labor be monitored? Will data on women's access to and control over resources be collected during the project?
- Can the project meet both practical gender needs (supporting and improving the efficiency of women's and men's productive roles) and strategic gender needs (improving gender equity through women's participation in the project)?
- Do the goals, purposes, or objectives of the program explicitly refer to women or reflect women's needs and priorities?
- Do the project inputs identify opportunities for female participation in program management, in the delivery and community management of goods and

- services, in any planned institutional changes, in training opportunities, and in the monitoring of resources and benefits? Will the project resources be relevant and accessible to poor women in terms of personnel, location, and timing?
- Does the project include measurable indices for the attainment of its Gender Analysis Development objectives, to facilitate monitoring and evaluation?

9.7.5. GENDER ANALYSIS FRAMEWORK CHECKLIST

According to Overholt et al (1985), the gender analysis framework contains a series of checklists consisting of key questions to ask at each stage of the project cycle: identification, design, implementation, and evaluation. These are:

Checklist 1: Women's Dimension in Project Identification

a) Assessing women's needs

- What needs and opportunities exist for increasing women's productivity and/or production?
- What needs and opportunities exist for increasing women's access to and control of resources?
- What needs and opportunities exist for increasing women's access to and control of benefits?
- How do these needs and opportunities relate to the country's other general and sectoral development needs and opportunities?
- Have women been directly consulted in identifying such needs and opportunities?

b) Defining general project objectives

- Are project objectives explicitly related to women's needs?
- Do these objectives adequately reflect women's needs?
- Have women participated in setting those objectives?
- Have there been any earlier efforts?
- How has the present proposal built on earlier activity?

c) Identifying possible negative effects

- Might the project reduce women's access to or control of resources and benefits?
- Might it adversely affect women's situation in some other way?
- What will be the effects on women in the short and longer term?

Checklist 2: Women's Dimension in Project Design

a) Project impact on women's activities

- Which of these activities (Production, reproduction and maintenance, socio-political) does the project affect?
- Is the planned component consistent with the current gender denomination for the activity?
- If it is planned to change the women's performance of that activity, i.e., locus of activity, remunerative mode, technology, mode of activity) is this feasible, and what positive or negative effects would there be on women?
- If it does not change, is this a missed opportunity for women's roles in the development process?
- How can the project design be adjusted to increase the above-mentioned positive effects, and reduce or eliminate the negative ones?

b) Project impact on women's access and control

- How will each of the project components affect women's access to and control of the resources and benefits engaged in and stemming from the production of goods and services?
- How will each of the project components affect women's access to and control of the resources and benefits engaged in and stemming from the reproduction and maintenance of the human resources?
- How will each of the project components affect women's access to and control of the resources and benefits engaged in and stemming from the socio-political functions?
- What forces have been set into motion to induce further exploration of constraints and possible improvements?
- How can the project design be adjusted to increase women's access to and control of resources and benefits?

Checklist 3: Women's Dimension in Project Implementation

a) Personnel

- Are project personnel aware of and sympathetic to women's needs?
- Are women used to deliver the goods and services to women beneficiaries?
- Do personnel have the necessary skills to provide any special inputs required by women?
- What training techniques will be used to develop delivery systems?
- Are there appropriate opportunities for women to participate in project management positions?

b) Organizational structures

- Does the organizational form enhance women's access to resources?
- Does the organization have adequate power to obtain resources needed by women from other organizations?
- Does the organization have the institutional capability to support and protect women during the change process?

c) Operations and logistics

- Are the organization's delivery channels accessible to women in terms of personnel, location and timing?
- Do control procedures exist to ensure dependable delivery of the goods and services?
- Are there mechanisms to ensure that the project resources or benefits are not usurped by males?

d) Finances

- Do funding mechanisms exist to ensure program continuity?
- Are funding levels adequate for proposed tasks?
- Is preferential access to resources by males avoided?
- Is it possible to trace funds for women from allocation to delivery with a fair deal of accuracy?

e) Flexibility

- Does the project have a management information system which will allow it to detect the effects of the operation on women?
- Does the organization have enough flexibility to adapt its structures and operations to meet the changing or new-found situations of women?

Checklist 4: Women's Dimension in Project Evaluation

a) Data requirements

- Does the project's monitoring and evaluation system explicitly measure the project's effects on women?
- Does it also collect data to update the Activity Analysis and the Women's Access and Control Analysis?
- Are women involved in designing the data requirements?

b) Data collection and analysis

- Are the data collected with sufficient frequency so that necessary project adjustments could be made during the project?
- Are the data fed back to project personnel and beneficiaries in an understandable form and on a timely basis to allow project adjustments?
- Are women involved in the collection and interpretation of data?
- Are data analyzed so as to provide guidance to the design of other projects?
- Are key areas of women inclusive development research identified?

9.7.6. GENDER ANALYSIS MATRIX

One of the key aspects of a Gender Analysis Framework is a matrix that studies affected stakeholder within a set of categories. It is an analytical tool that uses participatory methodology to facilitate the definition and analysis of gender issues by the communities that are affected by them. Using the Gender Analysis Matrix will provide a unique articulation of issues as well as develop gender analysis capacity from the grassroots level up. The Gender Analysis Matrix is based on the following principles:

- All requisite knowledge for gender analysis exists among the people whose lives are the subject of the analysis
- Gender analysis does not require the technical expertise of those outside the community being analyzed, except as facilitators
- Gender analysis cannot be transformative unless the analysis is done by the people being analyzed.

PROJECT OBJECTIVES:					
Stated Gender Objectives:					
Level of Analysis	Categories of Analysis				
	Labour	Time	Resources	Culture	Others
Stakeholder #1					
Stakeholder #2					
Stakeholder #3					

- **Labor:** This refers to changes in tasks, level of skill required (skilled versus unskilled, formal education, training) and labor capacity (how many people and how much they can do; do people need to be hired or can members of the household do it?)
- **Time:** This refers to changes in the amount of time (3 hours, 4 days, and so on) it takes to carry out the task associated with the project or activity.
- **Resources:** This refers to the changes in access to capital (income, land, credit) as a consequence of the project, and the extent of control over changes in resources (more or less) for each level of analysis.
- **Culture:** Cultural factors refer to changes in social aspects of the participants' lives (changes in gender roles or status) as a result of the project.

9.8. CHAPTER SUMMARY

Gender analysis and gender integration cannot be delineated from the macro economic development initiatives. That is why most of gender development policies approaches adopted in from welfare approaches to equity and efficiency which we are all looking forward to attain have always been discussed in line with macro economic policies. The gender dimension in planning has been compartmentalized thus causing inadequate integration of gender in planning. This inadequacy it can further be argued may be a reflection of the failure of the market economy and its forces to internalize the human dimensions of development. The politicians, the donor community, gender lobbyists, the academicians and NGOs have to a certain extent helped to keep the issues of gender planning and policy making alive in the development agenda in the macro economic mainstream. To make gender planning a reality, the macro economic planning approach has to be informed by gender analysis.

Raising gender awareness and promoting gender balance is an essential part of mobilization, management training, capacity development and poverty reduction. You need to develop specific strategies, identify those who would oppose the change, make them aware of benefits to themselves, and integrate this in all your work from the beginning. There is no specific recipe or set of activities to follow. You need to analyze the situation, utilize the principles noted in this chapter and custom-make a strategy that will be effective.

Annex 9.1: Identifying and Assessing Key Gender Issues

Category of Enquiry (what you want to find out)	Issues to Consider	Framework/s to consider
Roles and responsibilities: <ul style="list-style-type: none"> - What do women and men do? - Where (location/patterns of mobility) - When (daily and seasonal patterns) 	<ul style="list-style-type: none"> - Productive roles (paid work, self employment, subsistence production). - Reproductive roles (domestic work, childcare, and care of the sick and elderly). - Community participation and/or self help (voluntary work for the benefit of community as a whole). - Community politics (decision making and/or representation on behalf of the community). 	Harvard Analytical Framework

<p>Assets/Resources/ Opportunities:</p> <ul style="list-style-type: none"> - What livelihood assets/resources/ opportunities do women and men have access to? - What constraints do they face? 	<ul style="list-style-type: none"> - Human (e.g., reproductive health services, education). - Natural (e.g., land, water). - Social (e.g., institutions, organizations, civil society, social networks). - Physical (e.g., water supply and sanitation, housing, electricity). - Economic (e.g., income, credit, labor, capital). 	<p>Social Relations Framework (focus on distribution of resources)</p>
<p>Power and Decision Making:</p> <ul style="list-style-type: none"> - What decisions do women and/or men participate in? - What decision making do women and/or men usually control? - What constraints do women and/or men face? 	<ul style="list-style-type: none"> - Household level (e.g., decisions over household expenditure). - Community level (e.g., decisions over management of community resources). 	<ul style="list-style-type: none"> - Social Relations Framework (focus on distribution of responsibilities and power) - Women's Empowerment Framework (5 levels of equality useful in looking at power)
<p>Needs, Priorities and perspectives:</p> <ul style="list-style-type: none"> - What are women's and men's needs and priorities? - What perspectives do they have on appropriate and sustainable ways of addressing their needs? 	<ul style="list-style-type: none"> - 'Practical' gender needs (in the context of existing roles and resources, e.g., more convenient place to collect water). - 'Strategic' gender needs (requiring changes to existing roles and resources to create greater equality of opportunity and benefit). - Experience and views on delivery systems (choice of technology, location, cost of services, systems of operation, management and maintenance, etc). 	<p>Gender Planning Framework focuses on practical and strategic needs.</p>

Source: Adapted from Pasteur (2001).

Annex 9.2: Summary of key gender analysis steps

During program and project design, gender analysis is the process of assessing the impact that a development activity may have on females and males, and on gender relations (the economic and social relationships between males and females which are constructed and reinforced by social institutions). It can be used to ensure that men and women are not disadvantaged by development activities, to enhance the sustainability and effectiveness of activities, or to identify priority areas for action to promote equality between women and men. During implementation, monitoring and evaluation, gender analysis assists to assess differences in participation, benefits and impacts between males and females, including progress towards gender equality and changes in gender relations. Gender analysis can also be used to assess and build capacity and commitment to gender sensitive planning and programming in donor and partner organizations; and to identify gender equality issues and strategies at country, sectoral or thematic programming level.

The following summary of Key gender analysis steps are adapted from Juliet (2004):

- 1) Collect sex disaggregated household, workplace and community data/information relevant to the program/project for each area below.
- 2) Assess how the gender division of labor and patterns of decision-making affects the program/project, and how the program/project affects the gender division of labor and decision making.
- 3) Assess who has access to and control over resources, assets and benefits, including program/project benefits.
- 4) Understand women's/girls' and men's/boys' different needs, priorities and strengths.
- 5) Understand the complexity of gender relations in the context of social relations, and how this constrains or provides opportunities for addressing gender inequality.
- 6) Assess the barriers and constraints to women and men participating and benefiting equally from the program/project.
- 7) Develop strategies to address barriers and constraints, include these strategies in program/project design and implementation, and ensure that they are adequately resourced.
- 8) Assess counterpart/partner capacity for gender sensitive planning, implementation and monitoring, and develop strategies to strengthen capacity.
- 9) Assess the potential of the program/project to empower women, address strategic gender interests and transform gender relations.
- 10) Develop gender-sensitive indicators to monitor participation, benefits, the effectiveness of gender equality strategies, and changes in gender relations.
- 11) Apply the above information and analysis throughout the program and project cycle.

Annex 9.3: The New Zealand Agency for International Development (NZAID) gender analysis good practices (adapted from ESWCHP, 2007).

What the ESWCHP found out

The gender advisory support for East Sepik Women and Child Health Project (ESWCHP), Papua New Guinea, offers useful lessons about dealing with gender inequality and advancing women's empowerment in Papua New Guinea (PNG). Most importantly it shows how small incremental support to women provides them with opportunities to more successfully negotiate the complex social relations that characterize their lives and their communities in Papua New Guinea.

Learning lessons from these projects requires an initial understanding that gender differences are not the origin of women's subordination and oppression. Rather, in PNG, men and women become what they are as they enter into the negotiation of complex social relations. The relative differences accorded to men and women in these negotiations, however, stem from the particular socio-cultural politics of different places, the majority of which deliver more power to men than women.

In order to effect gender equality and empower women, closer attention to these socio-cultural politics of place is required. This is why supporting women in their negotiation of social relations must be the focus of 'gender work'. Ensuring that women get to the 'bargaining table' is the first step and this requires explicit support to grassroots women in the form of, for instance, training opportunities, the creation of meaningful work with some cash returns, and good health.

The identified impacts of the project were deeply rooted in philosophical positions taken at key times in the development of the project. **Phase One** had been very successful in terms of the identification of an effective way to deliver public health support in isolated communities by the use of locally trained and support '**marasin meris**'. As the project moved into **Phase Two**, with the increasing integration with the rural health services in PNG and greater focus on infrastructure support, the project lost its focus on women and gender equality.

The health outcomes of Phase One were widely appreciated by the communities. The establishment of a cadre of 332 (mainly women) **marasin meri** and **marasin man** (medicine woman and man) who were trained and provided basic family health care in isolated villages were appreciated and there were many anecdotes of their work making a substantial improvement in health and wellbeing of the rural poor. The review identified some areas in which the delivery of these services could be improved to ensure increased positive impact on the health side, e.g., the improved provision of medical supplies.

The review also found that the removal of the explicit gender equality and women's empowerment goal resulted in the project having a preoccupation with health delivery issues and the initial intended focus on women's issues was lost and with it the need to support the core people, the marasin meris, in this project.

The analysis showed that gender focus was lost for three reasons:

- the lack of an explicit goal
- because managers were not committed to or skilled in working with a gender equality and human rights perspective
- local social pressures

What the Team recommended

- **Make explicit the goal of women's empowerment and gender equality.** The focus on women and children has **strategic** importance (women play crucial role in improving and maintaining the primary health care of rural communities) as well as **practical** importance (the provision of village based assistance for minor health problems minimizes the numbers of people presenting to more distant clinics with major problems stemming from unattended minor problems).
- **Expand the focus on improvement of basic family health to refer to women's empowerment as being central to the project.** This is because women are the major health care providers within communities and also because they are critical for sustaining improved livelihoods.
- **Change the name of the grassroots workers from voluntia back to marasin meri** and marasin man - the shift to the term voluntia has meant a shift from the familiar gendered grassroots health care provider to an unfamiliar, ungendered community person working for nothing.

- **Ensure regular replenishment of medical supplies** - important for health objective of project but also because community support for and credibility of the grassroots workers (mainly women) broke down when they were ill equipped.
- **Expand basic kit to include materials for personal hygiene and for night work.** The lack of these provisions in the kits means that marasin women and men are drawing on their own limited domestic resource which in some cases is creating unnecessary gender tensions in households.
- **All project staff must have gender skills training** because getting it right inside the workplace is core to getting it right outside the workplace.
- **Address gender equality and women's empowerment issues within workplace** by examining practices around hiring, capacity building, up-skilling and re-skilling.

CHAPTER TEN: PROJECT IMPLEMENTATION PLANNING AND ORGANIZING

INTRODUCTION

A project starts from an idea with a definite mission and proceeds through different formulation and preparation processes in order to generate activities involving a variety of human and non human resources which all geared towards the achievement of a goal and stops once the objectives are fulfilled. This project stage is called implementation. It is a stage where the earlier preparations and designs are tested in the reality. It is at this stage we commit the huge share of our scarce resources allocated for the project.

Translating project plans into actual investment and operation is one of the most critical and difficult tasks. No matter how sophisticated or detail the project preparation work, it has no value unless it is transformed into action or implemented. The successful implementation of development projects depends on the efficient use of the scarce resources as planned. However, there are enormous problems that impeded the timely implementation of projects. These problems are more evident in developing countries like ours. Indeed there were very few successful projects that have been completed on time, at a reasonable cost and with the expected benefits realized.

Although there are other factors, the failure or the success of implementation is mainly attributable to the financial, managerial and institutional, technical and political factors. Particularly the influence of the quality of management significantly affects the performance of project implementation.

LEARNING OBJECTIVES

After studying this chapter, you should be able to:

- Understand the process of project planning and organizing.
- Understand approaches to project implementation.
- Understand the common and main problems in project implementation.
- Understand those issues that lead to successful project implementation.

10.1: PROJECT PLANNING AND ORGANIZING

Project planning need is much greater for project work than for normal operations. Project planning serves several important functions (Meredith and Mantel, 2006):

- It provides a basis for organizing the work on the project and allocating responsibilities to individuals.
- It is a means of communication and coordination between all those involved in the project.
- It induces people to look ahead.
- It instills a sense of urgency and time consciousness.
- It establishes the basis for monitoring and control.

A comprehensive project planning covers the following areas (Chandra, 2006; ICMR, 2007; Pearce and Robinson, 2001):

- a) **Planning the project work-** the activities relating to the project must be spelt out in detail. They should be properly scheduled and sequenced.
- b) **Planning the manpower and organization-** the manpower required for the project must be estimated and the responsibility for carrying out the project work must be allocated.
- c) **Planning the money-** the expenditure of money in a time-phased manner must be budgeted.
- d) **Planning the information system-** the information required for monitoring the project must be defined.

Project plan failures are mostly caused by (Choudhury, 1988; Joy, 1994):

- Lack of integration in both planning and implementation efforts,
- Absence of commitment on the part of people engaged on implementation, and
- Non-involvement by the top management and administrative ministries in the monitoring of projects and in trouble-shooting.

To attain success requires planning, implementing, and controlling the project through integration, commitment, and involvement. The ultimate objective of planning is timely and economical implementation.

Planning is the formation of a detailed scheme for proper arrangement of the necessary action steps and means for achieving the project objectives. The planning exercise should be guided initially by the overall time schedule and cost estimate given in the Detailed Project Report (DPR).

In the planning stage, the project is broken-down in to many manageable elements, fixed in to a time frame with in the overall time schedule, with an allotment of resources with in the overall project cost, and released for execution.

An achievable realistic plan fitting in with the overall project time and project cost is the essential requirement for a project's success. Performance guidelines and a controlling system to evaluate and modify the performance as required shall form part of the plan.

Between (i) the formulations of preliminary plan in the DPR stage and (ii) the finalization of plan for implementation, the plan has to be subjected to '**iterations**' for a possible reformation of the preliminary plan.

The traditional form of **Organization** characterized by a continuous flow of repetitive work, with each department attending to its specific functions, is not suitable for project work for the following reasons:

- It has no means of integrating different departments at levels below the top management and
- It does not facilitate effective communication, coordination, and control when several functional departments, with different professional backgrounds and orientations are involved in project work under time and cost pressures, which often call for overlap, at least partial, of development, design, procurement, construction, and commissioning work.

Hence there is a need for entrusting an individual (or group) with the responsibility for integrating the activities and functions of various departments and external organizations involved in the project work. Such an individual may be called the **project manager or project coordinator**. Depending on the authority that is given to the project manager/coordinator, the project organization may take one of the following three forms (Chandra, 1995, 2006; Choudhury, 1988; Joy, 1994; ICMR, 2007; Meredith and Mantel, 2006):

a) Line and Staff Organization

A person is appointed with the primary responsibility of coordinating the work of the people in the functional departments. He/she acts in a staff position to facilitate the coordination of line management in functional departments. The project coordinator does not have authority and direct responsibility of line management. He/she serves as a focal point for receiving project related information and seeks to promote the cause of the project by rendering advice, sharing information, and providing assistance. He may gently coax line executives to strive for the fulfillment of project goals. Deprived of formal organizational authority, he/she may find it difficult to exert leadership and feel unsure of his role. This type of organization is usually not suitable for large projects. **However, it is conducive to an efficient use of resources but is not suitable for an effective realization of project objectives.**

b) Divisional Organization

A separate division is set up to implement the project. Headed by the project manager, this division has its complement of personnel over whom the project manager has full line authority. It implies the creation of a separate goal-oriented division of the company, with its own functional departments. While the project manager still has the problem of coordinating the inputs of other organizations involved in the project, he/she has total formal control over the division he/she heads. **However, it is suitable for an effective realization of project objectives but is not conducive to an efficient use of resources.**

c) Matrix Organization

It seeks to achieve the twin objectives of efficient resource utilization and effective realization of project objectives, at the cost of greater organizational complexity. The project manager integrates the contributions of personnel in various functional departments toward the realization of project objectives. The personnel working on the project have a responsibility to their functional superior as well as to the project manager. **It seems to be a better vehicle for the simultaneous pursuit of the twin objectives, i.e., efficient utilization of resources and effective attainment of project objectives.**

Project Implementation can be defined as a project stage that covers the actual development or construction of the project up to the point at which it becomes fully operational. It includes monitoring of all aspects of the work or activity as it proceeds. It is where the earlier preparations and designs, plans and analyses are tested in the light of reality. The project's objectives are realized only when it is successfully implemented. Most of the work done in the earlier stages (i.e., identification, preparation, and appraisal) is directed toward ensuring successful implementation.

Project analysts generally divide the implementation phase into three different time periods. These are (Gittenger, 1996, 1998):

- a) **The investment period-** when the major project investments are undertaken.
- b) **The development period-** when the project's production builds up.
- c) **The life of the project-** when full development is reached.

For getting started a project implementation, we have to provide answers to the following questions about the project (Kebede, 2003):

- What are the goals and objectives of the project?
- Who are the principal participants in the project?
- When must the project be started and finished?
- Where will the project be executed?
- Why is the project being launched?
- How will the product or services be produced?

Activity 10.1:

- 1) Assuming that your brother intends to establish a "Hotel" business, prepare the plan for his project building construction by first identifying the series of activities to be involved.
- 2) By taking one project that is undergoing in your environment, describe briefly which type of project organization it follows.

10.2: THE PROCESS OF PROJECT PLANNING, ORGANIZING, AND MANAGING IMPLEMENTATION

These processes encompass (Gittenger, 1998; Meredith and Mantel, 2006; UNIDO, 1991):

10.2.1: DEVELOPMENT OF PROJECT PLAN OBJECTIVES

Planning aims at achieving the project completion making the most effective use of time and resources. Thus, **the scope of the project plan must be defined (i.e., define the boundary and define only the work required to complete the project successfully)**. A clear understanding of the plan objectives is a requirement for the plan's success. Ensure that the objectives are achievable, measurable, simple to understand and consistent with the resource levels fixed and assumptions made in the DPR estimates.

We can develop a statement of plan objectives in an orderly and systematic sequence through the following **seven questions**. We need to update ourselves and the project to the changing environment because there is a significant time gap between the present project implementation planning and organizing cycle and the previous project appraisal cycle.

a) What?

Describe the project objectives and its end results in detail and define the scope of work to be accomplished.

b) Why?

State the purpose of the project and why it is important to the national economy, to you, and to the project team.

c) How?

State the strategy and the approach or method proposed to adopt in the project's execution, i.e.,

- Define the management practices, construction technology, controlling and administrative procedures, information systems, etc and the nature of execution.
- Describe documentation and coding and accounting procedures.
- Specify commitment authority and financial power.
- Anticipate problems and develop contingency plan, etc.

d) Where?

- Define the geographic area or location where different activities will be carried out.
- Define the organizational level or division or team to which different tasks are assigned.

e) When?

- Fix a timeframe to the total project; with a schedule of major milestones, in line with the commitment made in the DPR, and then, with in the overall timeframe, fix time duration for every major project activity.
- Distribute the entire work over the project duration.
- Determine work sequence and priorities in an acceptable manner, suiting the overall plan.

f) How Much?

State the quantum (quantities) of the major activities involved and resources required based on the DPR estimates and subsequent firming up and refinements.

g) Who?

- Design the project organization and assign responsibility to teams and individuals with due consideration for competence.
- Specify the type and size of organization, hierarchy and levels, qualification and experience for each position.
- Specify job specifications of every position/title.

Activity 10.2: Assume that one of your best friends wants to engage in constructing a “Rent House” project in your environment. He also needs to prepare a business plan. Thus, he is requesting your expert advice on how to define his project idea. Therefore, define his project objective in brief.

10.2.2: PROGRAMMING OF ACTION

Program is the forerunner of schedule. It is from a program of action that the schedule is prepared. The programming of action comprises:

a) Listing of Works (List the Work)

List the tasks and the activities under each work, showing main work elements of the total project by functions, disciplines, skills, crafts, and etc. The list can be a simple, phase wise, tabular statement with columns for task code, task description, durations (working days), and estimated man days (category wise).

PROJECT CODE-01

Task Description	Task Code	Man days
Electrical Work	011	2
Civil Work	012	5
*****	*****	*****

b) Definition of Work

Define the listed work elements in greater detail for clearer understanding. This definition should remove uncertainties, if any, contained in Detailed Project Report.

c) Work Breakdown Structure (WBS) and Codification of Tasks

The WBS is a detailed listing of the deliverables and tasks for completing the project. It is a top-down, broad to specific hierarchical outcome of the work to perform. Knowledge of the project outputs then makes possible the breaking down of the project in to management components and sub components. There are several benefits to developing WBS:

- Forces the project manager, team members, and clients to delineate the steps required to build and deliver the output.
- Lays the groundwork for developing an effective schedule and good budget plans.
- Makes it easier to hold people accountable for completing their tasks.

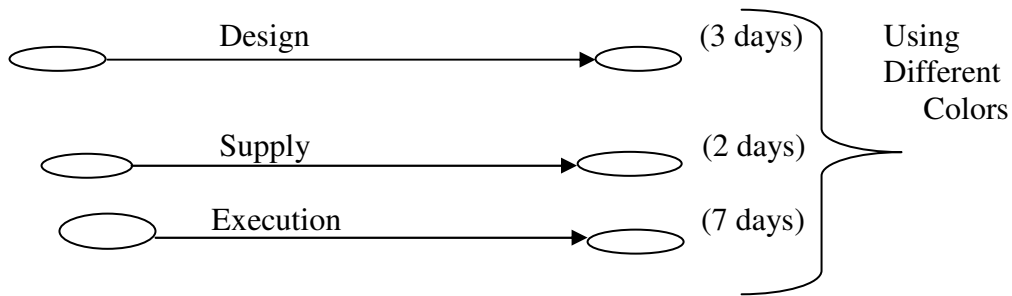
Following the identification of activities, the following factors can be identified for each individual activity. These are:

- The sequence of project activities.
- The resource requirement for undertaking the activity.
- The estimated time it will take to complete.
- The responsibility for undertaking it.

Breakdown the work into small packages and activities for easy control and codify them. The volume of work allotted to a team should be of a controllable size. Codification of tasks and related project accounts facilitate effective management and control. The numbering structure should be logical, interrelated and level related. Coding can be done either numerically or alphabetically or combined alpha-numerically. The coding system and numbers must be made known to every body connected with the project.

d) Modeling the Work

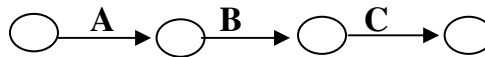
Make models of the main work segments with a beginning and an end, i.e., make graphic models of the main segments and important elements of the work. The models shall indicate the various angles of the type and magnitude of the work to be put in, and the technical, functional, and logical relationship of the various activities involved in the work. Addition of time duration to every model with a beginning and an end is done here. The time is fixed in terms of project months or project days, starting from the zero date. For example,



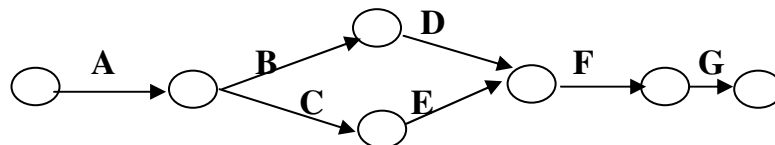
e) Fixation of Sequence and Priority

Fix sequence and priority. Different work packages may have different phased-out commissioning dates for technical and financial reasons, necessitating a correspondingly phased-out completion of work. Besides, for economic or technical reasons, some segments may have to be accomplished on priority over others. For this reasons, sequence and priority have to be given due consideration while doing programming. For example,

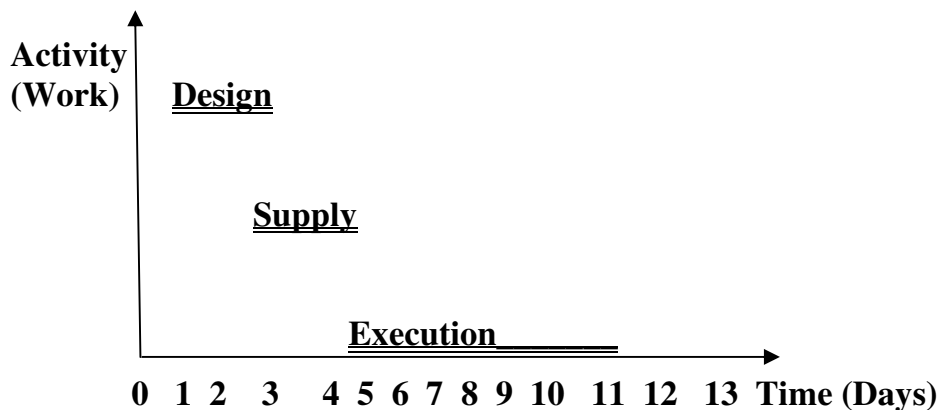
Sequence:



Or,



Priority:



- Time is fixed and priority is made based on zero year assumption.

f) Fixation of Activity Duration

Fix activity duration. Every activity shall be allotted realistically estimated time duration so that the sum total of all such durations minus the net overlapping would be equal to the project duration.

It is usual to fix a shorter than permitted duration, keeping a **buffer time** for any possible slippage, i.e., contingency time.

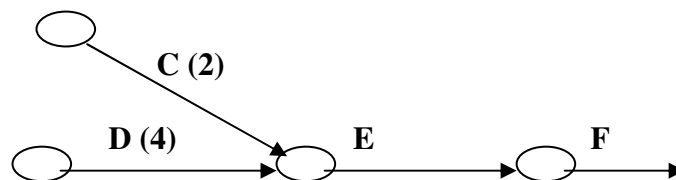
$$\text{Target Time} = \frac{\text{Scheduled Completion}}{\text{Time}} + \frac{\text{Contingency}}{\text{Time}}$$

$$\text{Activity Duration} = \frac{\text{Activity}}{\text{Time}} - \frac{\text{Overlap}}{\text{Time}} + \frac{\text{Contingency}}{\text{Time}}$$

Assuming **section 10.2.2(e)** above, the supply work started after two days, therefore, there is one-day overlap. Then, the activity duration equals to 13 (i.e., $3 + 2 + 7 - 1 + 2$). The **+2** day is contingency time allowance.

g) Identification of Critical Activities

Identify critical activities for special attention. Some activities finishing do not hold up (tie) other activities. But, some activities are so critical that the preceding items' tie-in and succeeding items' start are dependent on their finishing. These latter items have to be separately identified and listed for special management attention towards their completion, in the interest of timely completion of the project. We may call it as a "**red list**". For example,



- Slack of two days to start activity **E**, because activity **D** must be fully completed to start activity **E**.
- Decision should be made when to start activity **C**; either simultaneously with activity **D** (called **forwarding**) or two days after activity **D** starts (called **back warding**).

Activity 10.3: Assuming your friend's "Rent House" project above, Purchasing equipment and furniture is one of the main project works to be involved. Therefore, define and breakdown the purchasing work in to its tasks, model them by giving code, fix duration and put them in sequence using the Gantt Chart. Besides, identify the critical activity with brief explanation.

10.2.3: SCHEDULING OF RESOURCES AND TIME (PROJECT IMPLEMENTATION SCHEDULE)

Scheduling is principally the exercise of laying out and integrating time, resources, and the main work elements of engineering, procurement, and construction on the most efficient manner to achieve the project execution. Resources availability and their economic levels of distribution, time duration for individual activities and for the total project, and the estimated costs are interrelated through the scheduling exercise.

Schedules deal not only with construction or other investment components, but also with actions such as appointment of staff and consultants, adoption of legislative or administrative measures, changes of policy, etc. Further more, scheduling of projects has the following major advantages (ICMR, 2007; Meredith and Mantel, 2006):

- Encourages planning
- Guideline project execution
- Establish day to day priorities
- Control of progress (targets, milestones)
- Achieve better resource allocation
- Minimize project costs

Features (characteristics) of good schedule (Chandra, 2006; Choudhury, 1988; Joy, 1994):

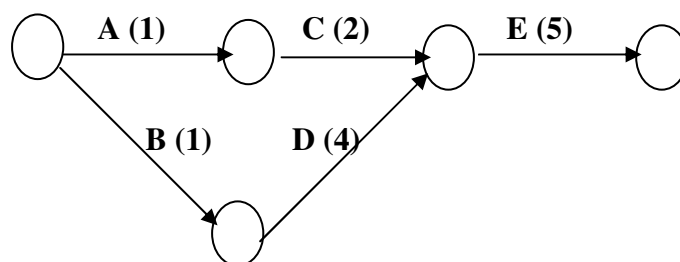
- All work items included
- Sequence of work clearly shown
- Easy to understand
- Easy to revise
- Important work items highlighted
- Constraints easily detected

a) Forward and Backward Scheduling (Resource Smoothing)

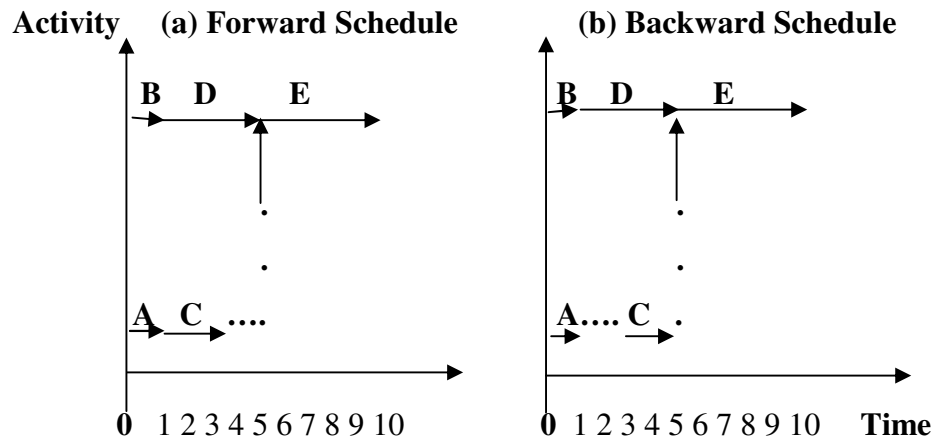
It is a scheduling strategy used for keeping down the level of resources deployment and making the optimum use of them by taking advantage of floats. This can be done by estimating the time for all individual work elements.

Forward scheduling starts as soon as working **front clearance** is available for an activity and it often finishes before the required due date. The philosophy is '**finish every activity as early as possible**'. On the other hand, **backward scheduling** starts backwards from the required due date of finishing the activity and arrives at a required starting date. The philosophy is '**finish economically when required**'.

All activities lying outside the critical path are generally subjected to both forward and backward scheduling. For example,



- The critical path is **B** → **D** → **E** that takes **10 days** to complete the job.



b) Resource Assessments and Matching

Assess the resources requirement in detail and match them with the project estimates, i.e.,

- Take stock of the total available resources (**AR**) that can be mobilized during the activity time.
- Assess the most economic quantity of resources requirement (**RR**) for finishing the activity with in the time duration.
- If **RR > AR**, revise the activity duration using the forward and backward scheduling technique (i.e., called **Resource Smoothing**); adjust the volume of activities to suit the **AR**; and then calculate the reassessed requirement of resources (**RRR**).
- Make provision for procurement of the difference between **RRR** and **AR**.
- Make a master bar chart schedule of the activities with starting and finishing dates and a corresponding tabular schedule of time phased allocation of all resources.

c) Master Schedule and Master Budget

Make overall (i) master schedule with mile stone completion dates and (ii) master budget supported by detailed scheduling of resource.

- A corresponding master schedule of resources should list the requirements of major resources of man, equipment, and materials for the same work packages in a matching time phase with consideration for procurement time and mobilization time, to enable timely work execution.
- A corresponding master budget shall ensure financial allocation and the project fund flow.
- The master resources schedule and master fund flow statement shall be based on the project cost estimate, project investment cost distribution schedule, and their subsequent refinement based on firmed up project data and engineering details.
- Several-detailed breakdown scheduling of individual activities and resources shall support the master schedule. Also the master budget shall be supported by detailed budgets of different resources.

Key events or ending of key activities in the course of setting up a project are milestones. Their achievement with out slippage on the specified dates will generally ensure the project's timely completion. So a project must have a separate master milestone schedule for special management attention. Its contents are the numbers indicating milestone events placed in circles set in calendar time columns with arrows linking the preceding and succeeding events.

d) Make Time-Phased Construction Schedule, Manpower Schedule and Construction Equipment Usage Schedule

Item	Period (Workday)							
	1	2	3	4	5	6	7	8
Manpower	US	SS	S					
Material								
Equipment	EM		CR		CRU		SO	
Resources								

Where, US = Unskilled, SS = Semi-skilled, S = Skilled, EM = Earthmover, CR = Crane, CRU = Crusher, SO = Sorter

Construction Usage Schedule:

(i) Manpower Resource

Type	Source		
	Own	Hire	Contract
Project Mgt.	√	-	√
Construction	-	√	√
Operations and Maintenance	√	√	-
Management and Control	√	√	-

(ii) Equipment Resource

Equipment	Source		
	Own	Hire	Contract
Earth Mover	√		
Crane	-	√	√
Crusher		√	√
Sorter	√	-	-

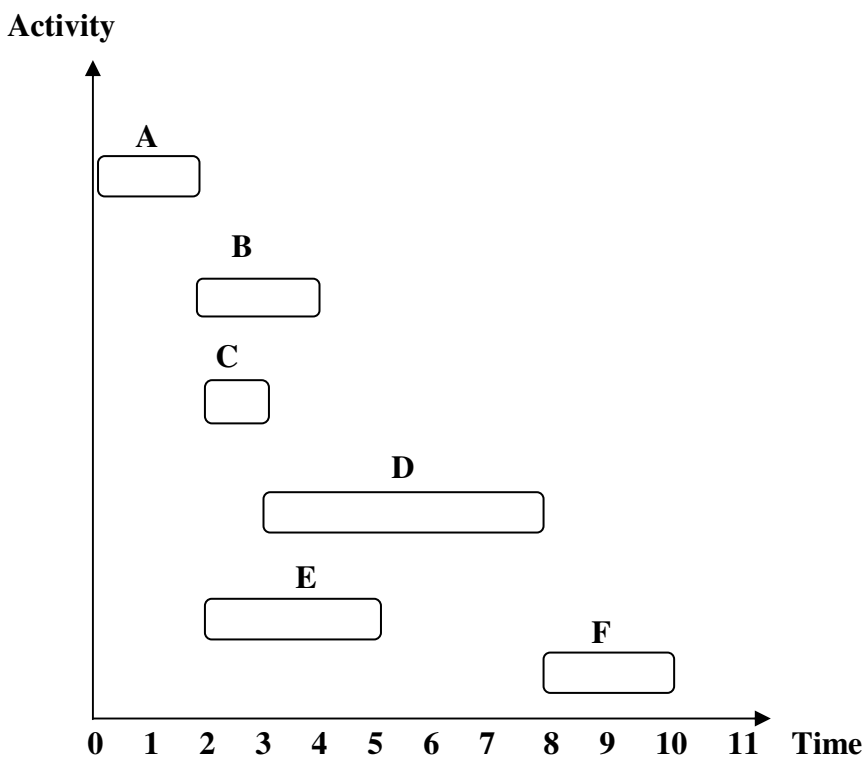
e) Make Schedules of Ordering and Delivering of Incorporated Equipment S and Materials

Procurement Schedule

Equipment	Order Date	Receipt Date	Last usage Date	Delivery Date
Earth Mover	191 st	198 th	201 st	201 st
Crane	188 th	198 th	218 th	218 th
Crusher	180 th	183 th	193 th	193 th
Sorter	180 th	183 th	195 th	195 th

f) Make Detailed Schedules for All Key Tasks, Dovetail Schedules and Integrate Them in to the Master Schedule

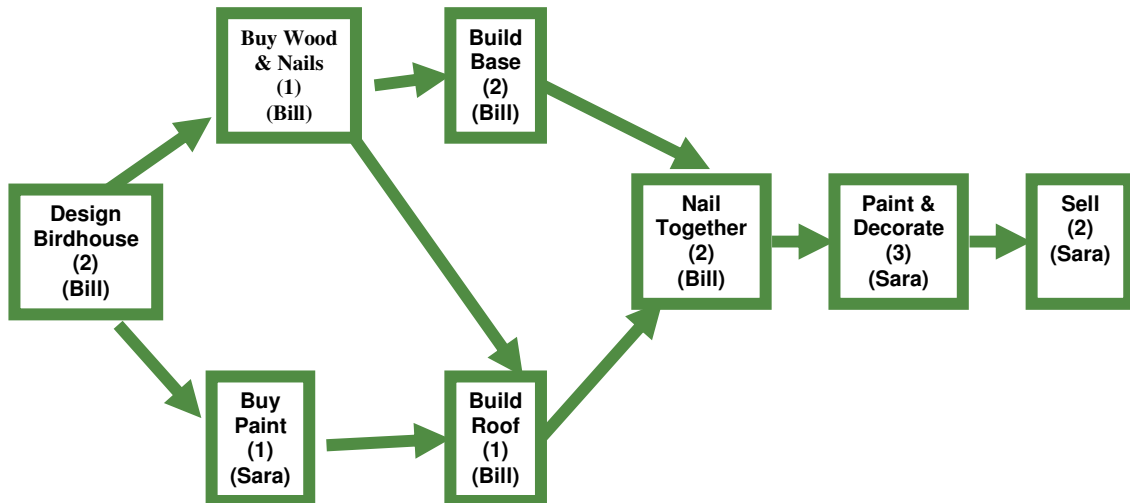
Schedule Bar Chart



Sample Gantt-Chart and Network Chart

- For building and selling a birdhouse and
- Each block contains a task and a time estimate.

	Period											
	1	2	3	4	5	6	7	8	9	10	11	12
Design birdhouse	█	█										
Buy wood & nails			█									
Buy paint			█									
Build roof				█								
Build base				█	█							
Nail together						█	█					
Paint & decorate								█	█	█		
Sell											█	█



Activity 10.4: Briefly discuss the rationale for (1) “Forward and Backward Scheduling” (2) and “Resource Assessments and Matching” in a development project.

10.2.4: ORGANIZING PROJECT TEAM, INFRASTRUCTURES AND WORKING METHODS

A good project organization in which all individuals concerned constantly interact for achieving project objectives is vital for the success of a project. In this stage, the organization is given a more formal character and strengthened with clearly defined responsibilities and commensurate (adequate) authority.

a) Creating Internal Team

Make a strong cohesive (unified) internal team to suit the project’s internal as well as external environment. The establishment of project implementation unit and the selection and appointment of a competent and capable project manager is vital for project implementation. Similarly selection of key project staff or strategic personnel should be given due consideration. For example, establish recruitment, procurement, engineering and technical committees.

b) Setting Agencies

Involve all agencies connected with the project (i.e., all the stakeholders) and establish an integrated all agencies' project team, that is, a committee represented by the project people and the stakeholders. For example, establish a project implementation council comprising the project people, local administration, financial institutions, etc.

c) Coordination

Make and issue co-ordination procedure guidelines and operating manuals that will govern the internal team and the agencies. For example, the “financial manual” for the internal team and “power and duty protocol” for the agency.

d) Communication

Set up communication network and streamline project administration, such postal, telephone and internet services.

Activity 10.5: Briefly discuss how to coordinate project’s purchasing activities by giving an illustration.

10.2.5: PROJECT BUDGET AND FUND FLOW STATEMENT

In the study phase, the budget and fund flow statement were prepared. At this stage, they have to be rechecked, revised, where necessary, and time-phased to suit the schedule.

a) Master Budget

Ensure that the master budget is time-phased according to assured funding arrangements and the master schedule.

b) Detail Budget

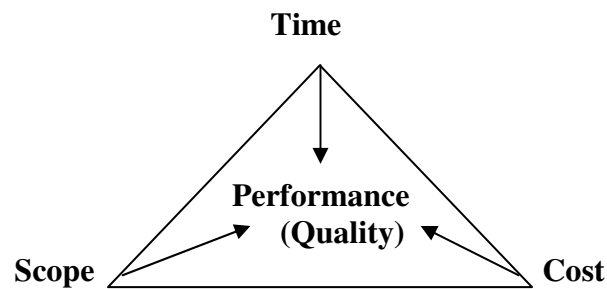
Make and issue detailed budgets and performance standards for each functional department in the project.

c) Cash Flow Statement

Make cash flow statement to suit disbursement for suppliers, services, and construction, as finally scheduled.

10.2.6: DESIGNING A CONTROLLING SYSTEM

The primary aim of a project is to deliver a product to a client within the specified **time**, **cost** and **scope**. The success of a project depends on the project manager’s ability to strike a balance between these interrelated variables or constraints. The project manager controls project **Performance (Quality)** in terms of **Time**, **Cost** and **Scope** parameters.



- What is the time required for each activity?
- What is the cost required for each activity?
- What is the scope level required for each activity? Performance or quality denotes specifications or requirements of deliverables.

Like any human undertaking, projects need to be performed and delivered under certain constraints. These constraints are **scope**, **time** and **cost**. These are also referred to as the Project Management Triangle where each side represents a constraint. One side of the triangle cannot be changed without affecting the others. A further refinement of the constraints separates product quality or performance from scope, and turns quality into a fourth constraint.

The time constraint refers to the amount of time available to complete a project. The cost constraint refers to the budgeted amount available for the project. The scope constraint refers to what must be done to produce the project's end result. These three constraints are often competing constraints. Increased scope typically means increased time and increased cost; a tight time constraint could mean increased costs and reduced scope; and a tight budget could mean increased time and reduced scope.

The objective of the control system is to control the schedules of time and cost, achieve the required quality within the prescribed scope, and reduce the risks connected with the projects. This objective is to be achieved through the following steps.

a) Integrating Total Activities

Planning and performance with an eye on the sequence of activities and integrating all related activities will ensure fast completion of the total project, enabling timely commissioning, and make certain total quality management (TQM). One limping or delayed item of work/activity can have its adverse ripple impact on many connected items or even on the whole project.

b) Fixation of Performance Standards

Performance standards are fixed in terms of cost, timing, duration, method, speed, quality standards and quantity and shall be made known to every body so that each team responsible for execution of any activity would in fact adhere to standards set.

Setting standards of performance (i.e., performance indicators or performance criteria) is a useful start in project implementation. We should identify and list key areas, typical tasks and activities. This could serve as a checklist and it will be less likely to miss some thing.

How do we develop standards of performance?

A useful technique for making the apparently immeasurable measurable is goal analysis. The start of the process is to plan how the activities take shape in terms of timing, resources, budgeting, personnel, etc. The important thing is to establish at the outset:

- Who will do what?
- When and with whom?
- What types of inputs needed?
- What outputs expected?
- A workable schedule, etc.

c) Monitoring of Performance

Monitoring is the exercise of removing bottlenecks and measuring the achievements against targets. This is best done by breaking down the total project in to daily targets of different activities and achieving the targets with out fail. Here again, the daily targets can be achieved only if there is perfect coordination of all connected activities, because a slippage in one activity can cause hold up of all the dependent activities.

d) Plan Updating

Plan updating takes place upon project review, to introduce a new status to the project as a result of slippages, or to give effect to changes in **logical work sequences**, or time estimate, or any shift in critical path. This is done in two parts:

- (i) Analytical (narrative) report explaining the project status, covering the various activities, problems, and mile stone status.
- (ii) A new computation of the schedule to maintain the completion date. Further, a rearrange schedule is prepared if needed for the remaining (uncompleted) portion of the work.

e) Performance Evaluation

Performance evaluation is done in terms of:

- Work completed against scheduled activities,
- Cost incurred or resources spent against budget,
- Productivity achieved against norm, and
- Quality achieved against standard.

f) Corrective and Preventive Actions

Sets of general corrective steps are to be taken to offset adverse variances in performance and put the project back on track. The performance reporting or trending system should enable its users to anticipate potential problems and take **contingency measures** to prevent them.

The steps may include:

- Expediting supplies,
- Accelerating work by employment of additional resources,
- Introduction of incentive scheme,
- Rescheduling, and
- Time crashing.

g) Reporting System

Reporting system should be designed to depict progress of work and adherence to schedule by all agencies, resources utilization, inspections, quality, bottlenecks, milestone achievements, human aspects, social aspects and all other issues that are considered to have an impact on the project must be covered by the reporting system.

The reporting system should ensure:

- Regular flow of data from contractors, vendors, and the owner's internal departments,
- Analysis of data, converting them in to precise **Management Information Reports** (MIR), capable of communicating the project status, in the most effective manner,

- Distribution of the MIR,
- Obtaining management decisions on corrective steps, if needed, and
- Giving the necessary feedback and feed forward instructions to the reporting agencies, and planning and executing departments. Feed forward on future situations should help in taking preventive actions and plan future work better.

Activity 10.6:

- 1) Briefly discuss the rationale for “Integrating Total Activities” in a development project.
- 2) Assuming your friend’s “Rent House” project above, (a) set the standards to monitor and evaluate the performance of the project’s purchasing equipment and furniture and (b) design its reporting system to depict the work progress.

10.3: PROBLEMS IN PROJECT IMPLEMENTATION

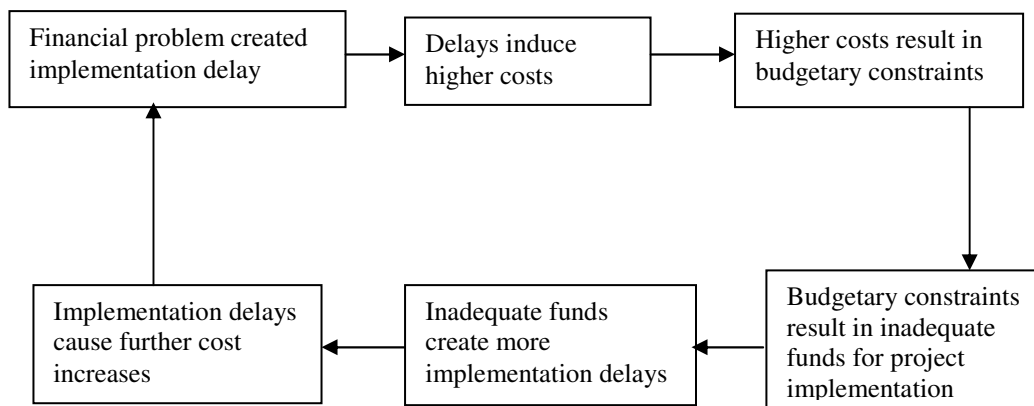
There are enormous problems in project implementation. Particularly in developing countries, the nature and degree of problems varies from sector to sector, from project to project, from region to region, and from area to area. However, for the convenience of discussion, the commonly encountered project implementation problems are divided into four categories. These are financial, managerial and institutional, technical and political (Choudhury 1988; Kebede, 2003; Joy, 1994; Gittenger, 1996, 1998).

10.3.1: FINANCIAL PROBLEMS

Financial difficulties occur frequently during project implementation. Inadequate allocation of budgetary funds, shortage of foreign exchanges (for projects constitute foreign components), delay in budget releases, general price and salary increases, change in tariff and interest rates, and losses due to fluctuations in foreign exchange rates are the most common causes of financial problems.

The effects of financial difficulties on implementation are (ICMR, 2007; Kebede, 2003; Meredith and Mantel, 2006):

- Delay/interruption of project activities
- Cost increase (over-run)
- Reduction in the scope of the project



10.3.2: MANAGEMENT PROBLEMS

This encompasses what are usually considered institutional problems. Managerial problems can be manifested:

- In the top government administration
- In the regional or local levels
- In the upper or middle management of the project and/or implementing agencies.

An ill defined organizational set-up, low salaries and poor staffing policies, lack of coordination among various agencies that influence the project implementation, and discontinuity of management as a result of changes for political and other reasons, etc are some features of management problems. Weak management and institutional capacity is a reflection of lack of skilled manpower, inadequate monitoring and evaluation system, inadequate project coordination and lack of information system. **These managerial and institutional problems are often the root cause of implementation delays and cost over-runs.**

10.3.3: TECHNICAL PROBLEMS

In many cases technical problems result from the poor estimates and projections on the project activities and characters during the preparation stage. For example, in **engineering** area such problems as difficult soil conditions, poor quality of materials, technical defects in design, mistakes in installation and start-up of equipment, unsuitability of imported equipment for local conditions, etc. And in **agriculture**, inadequate technical packages, inadequate awareness of the beneficiary farmers, etc are some of the frequently observed problems.

Although technical problems do arise continuously in the course of implementation, solutions are generally found. However, better technical preparation standards result in better implementation, particularly with regard to technical aspects and, therefore, reduce both implementation delays and cost over-runs.

10.3.4: POLITICAL PROBLEMS

When government (at all levels) commitment is absent, weak or changing, obviously project implementation suffers. A rapid rotation of political appointees in some areas considerably influences success in project implementation. Project management has to take in to account the potential impact of such political and administrative factors, anticipate the problems in so far as possible, and modify the implementation path accordingly.

10.3.5: OTHER PROBLEMS

Donor conditionality, lengthy project approval and fund disbursement procedures of donors (financing agencies), low community involvements in project planning and implementation, etc are the other contributing factors in delay of implementation.

Activity 10.7: By considering one project, which is undergoing in your environment, discuss on the problems encountered during its implementation with a brief justification, if any.

10.4: SUCCESS IN PROJECT IMPLEMENTATION

A successful project implementation means that the project has been completed on time, at or reasonably close to the original cost estimates, and with the expected benefits realized or even exceeded. The following are some of the principal factors that could account for successful projects (Kebede, 2003):

10.4.1: POLITICAL COMMITMENT

Strong and sustained commitment by all levels of the government body (national, regional, zonal, Woreda, and Kebele) to the project's objectives is the first and probably most important reason for success. Political or government commitment mean that the continuing interest and active support of these agencies and individuals who are in a position to influence attainment of the project's objectives whether through the allocation of human, financial and other resources or through the workings of the administrative and political apparatus.

It is strongly advisable that stakeholders' participation and consultation during project preparation would help to ensure commitments, i.e., to incorporate the main influencing agencies and actors in the preparation and appraisal process would enhance more the success in implementation. A careful monitoring of the political environment is one of the duties of a good project manager.

10.4.2: SIMPLICITY OF DESIGN

Selection of proper project design is central to successful project implementation. Projects with relatively simple and well-defined objectives and based on proven and appropriate technologies or approaches have a better chance of being implemented successfully. The major success factors in some rural development programs and projects appear to have been the appropriateness of the technologies proposed for the specific local conditions, the complement of recommended inputs, and the strength of the support systems, etc.

10.4.3: CAREFUL PREPARATION

Project must be sufficiently prepared before it started. Careful preparation includes not only matters such as detailed engineering and land acquisition but also other technological packages, socio-economic factors, environmental issues, organizational and institutional arrangements, and other supporting services.

For a big project, like that of rural development, pilot project is sometimes important to test proposed activities and approaches under local conditions. This would not only improve success in implementation but also help to save both time and money that might be unnecessarily spent.

10.4.4: GOOD MANAGEMENT

The influence of the quality of management on project implementation performance is usually visible. Many projects in serious difficulty during implementation have been turned around by the appointment of a competent manager. What are the qualities of good manager and management?

Superior performance in managerial job is associated with performing satisfactorily 'key areas' of the job. A key area can be defined as a major component of a managerial job of such importance that its failure to perform satisfactorily will endanger the whole job. The following are the standard list of key areas of project manager's job. The list is only an approximation of the job of a project manager, and if it is used, it needs to be compared intelligently with the actual situation of the project under consideration.

STANDARD LIST OF 'KEY AREAS' FOR A PROJECT MANAGER

Cusworth and Tom (1993), Cuury and Weiss (1993) and Kebede (2003) have identified the following key areas for a project manager:

A. Prepare and Maintain a Project Work Plan

- Review project priorities
- Prepare overall and progress work plan
- Update overall and progress work plan

B. Maintain National and Local Information

- Recall country problems and priorities
- Recall local problems and priorities
- Recall related programs/projects
- Recall cultural characteristics
- Recall social and economic characteristics
- Recall geographical characteristics
- Recall political characteristics

C. Mobilize Project Resources

- Recruit staff
- Obtain funds
- Secure facilities
- Procure equipment and supplies

D. Manage Staff

- Agree and review individual work plan
- Use appropriate management style
- Reward performance
- Manage staff training

E. Manage Funds

- Prepare estimate of expenditures
- Maintain budgetary planning and control systems
- Maintain controls for disbursement of funds
- Prepare financial reports

F. Manage Materials and Facilities

- Maintain inventories
- Maintain equipment, facilities, vehicles, etc
- Maintain security systems
- Operate comprehensive insurance policies

G. Monitor and Evaluate Progress

- Monitor activities
- Monitor outputs
- Monitor administration

H. Maintain Communications

- Prepare manager reports
- Ensure team prepares report
- Maintain record
- Maintain correspondences
- Maintain working relationships with national and local institutions and with related programs/projects

10.4.5: OTHER FACTORS

In addition to the above list, following are the other contributing factors for project implementation success:

- Well defined goals and objectives
- Agreement over goals and objectives among the participants in the project
- Detailed work break-down structure and commitment to achieving goals and objectives
- Reliable monitoring and tracking techniques, etc.

Activity 10.8: By considering one project, which is undergoing in your environment, discuss on the factors contributing for its successful implementation with a brief justification, if any.

10.5: CHAPTER SUMMARY

The scope of a project determines the boundaries of the project. The scope specifies what features/characteristic of the project product is included and what is not included. Once a project has been chosen, the project manager and the client jointly prepare scope of the project and its deliverables.

Every project is a group of several activities. The expected project outcome can be achieved only when all required activities are identified, planned for, and implemented. The WBS is a useful tool that enables the project manager to identify all the activities and put them in proper sequence. The WBS helps the project manager to have a clear vision of the entire project and overall processes required to achieve project objectives. The WBS which breaks down the project into several activities can be used both as a planning and a reporting tool. The project manager should ensure that the WBS is flexible and that changes can be incorporated when needed.

A project network diagram is a representation of all the project activities and the logical relationships among them. The project network diagram helps the project manager in sequencing and scheduling project activities. The project network diagram represents all the project activities, their estimated completion times and the sequence in which they are to be performed.

The project manager estimates the duration of project activities based on similar activities of known duration, historical data, expert advice, etc; identifies the critical activities of the project based on the project network diagram and estimates the project duration; and controls the schedule of the project to complete it within the desired time.

Project human resource management involves all the processes that are required to make the most effective use of the individuals associated with the project. Good leaders are essential for the successful management of projects. To effectively manage a project, these leaders require a group of dedicated individuals, committed to achieving

project goals. While selecting good staff is important, it is equally important to assign them the right jobs. The project manager plays a key role in the success of a project.

Complex projects involve multifunctional tasks that demand a high level of innovation and state-of-the-art technology. Such projects require teams of specialists with diverse skills. The team building process is based on the type of the project, the leadership style of the project manager and on the type of individuals involved in the team.

Procuring is one of the major challenges faced by project managers, especially when the project is one of infrastructure or manufacturing. These projects require various materials and skills from external sources and therefore it is important to adhere to the organizational standards for quality and price. Project procurement management is the process of acquiring goods and services from a firm external to the project organization.

Costs do not occur, they are incurred. Failure to control costs has led to the failure of several projects. The process of cost management is done in four steps: resource planning cost estimating, cost budgeting and cost control. Projects generally incur more costs than planned. These extra costs are called cost overruns. Cost overruns occur because of cost escalations, time overruns, scope changes, budget underestimation/omission, rectifications and replacements and unforeseen contingencies.

Quality is the totality of features and characteristics of a product or service that bears on its ability to satisfy stated or implied needs. Maintenance of good quality improves business for the firm. Clients view the quality of a project as: conformance to specifications, value for money, fitness for use, support, psychological impression. Firms incur costs when they attempt to improve quality and these costs are referred to as 'cost of quality.' The cost of quality can be classified as costs of prevention, costs of appraisal and costs of failure.

A quality circle is a group of employees who voluntarily meet to discuss the quality issues. These circles help the management and the employees improve quality of the project. Just in Time (JIT) systems integrates all organizational processes by eliminating wastes and by using minimal inventories. The principles of total quality management (TQM) also help the project manager for consistent improvement of project product quality.

The possibility of an outcome being different from what was expected is termed risk. Risk is present in every activity. Projects are exposed to various kinds of risks: technical risks, social risks, economic risks, political risks, marketing risks, human risks and production risks. On the basis of their attitude toward risk, the project managers can be broadly divided into three types: risk averters, risk neutrals and risk seekers. The risk management process consists of four steps: risk identification, risk quantification, risk response and risk control. Project managers should be aware of several project insurance policies to safeguard projects against the risks.

Project control is the process of collecting information related to the performance of the system, comparing it with the desired level of performance and taking corrective action to decrease the gap between the actual and the desired performance levels. It is aimed at managing the deviations in cost, time and performance of a project.

A project undergoes the different kinds of control reviews during its life-cycle. They are status reviews that review the status of cost, performance, schedule and scope of the project, a design review that reviews the design of a product or service to ensure that it meets client requirements and a process review that reviews the processes and checks for the possibility of any improvements.

Project communications management includes all those processes that are required to ensure that the information pertaining to project is generated, collected, disseminated, stored and ultimately, disposed off, in a timely and appropriate manner. Information and communication requirements of various project stakeholders shall be identified and distributed as required. Stakeholders are those individuals who are interested in the project deliverables, are affected by the project activities and associated with the project directly or indirectly.

10.6: CHAPTER END ACTIVITIES

- a) One of your relative wants to invest in bread bakery project. Besides, she seeks your expert help on project implementation planning and organizing. Therefore,
 1. List out, in detail, the series of activities to be involved in constructing the project building.
 2. Determine the time required for each activity listed above.
 3. Put these series of activities in sequence (priority) by using arrow and nod.
 4. Prepare a Gantt chart.
- b) Assuming the same project as above,
 1. List out, in detail, the series of activities to be involved in purchasing a baking machine from abroad.
 2. Determine the time required for each activity listed above.
 3. Put these series of activities in sequence (priority) by using arrow and nod.
 4. Prepare a Gantt chart.
- c) Identify at least four projects that are in progress or are completed. Then, classify them as successful or problem project, and put the factors that make them either successful or problem with brief explanation.

CHAPTER ELEVEN: PROJECT IMPLEMENTATION MONITORING AND EVALUATION

INTRODUCTION

One of the possible steps that need to be taken to raise the implementation rates of any project is through organizing a strong Monitoring & Evaluation (M&E) mechanism, which is geared at tackling the implementation constraints. Therefore, for any organization or institution in order to attain its program /project objectives, the need to develop and applying practical M&E system is unquestionable. Studies indicated that the absence of reporting discipline and insufficient awareness of the objectives and functions of M&E has led to failures of timely identification and correction of problems. Project managers in most cases view M&E units as surveillance agents operating on behalf of the concerned ministries, authorities or funding institutions. But this is a wrong view, which is persuaded by the misunderstanding of the purposes of M & E.

M & E are part of the process of project management. The two activities mainly focus on stipulating information requirements, collecting and processing information, comparing target and actual performance of planned activities, inputs of resources, assumptions, project impacts and assessing deviations of outputs from the objectives of the program/project.

M & E provide macro and micro-level description and analysis, respectively of the process and effects of development activities to program/project designers and managers and those who allocate the necessary resources.

LEARNING OBJECTIVES

After studying this chapter, you should be able to understand:

- The concepts and definition of M&E,
- The objectives and use of M&E,
- How to develop and select indicators for M&E, and
- The considerations that should be made on M&E of development projects as well as on the analysis of impacts resulted from the projects.

11.1: THE CONCEPT OF MONITORING & EVALUATION

Various authors define these terms differently. However, for our purpose we can take the following concepts and definition.

Monitoring is a continuous process of gathering, analyzing and interpreting of information of the daily use of inputs and their conversion into outputs in order to enable timely adjustment of the development Program/project when necessary. Hence, it is a basic part of implementation management.

Evaluation, on the other hand, is a systematic and periodic gathering, analyzing and interpreting of inputs, information on the effects and impacts of a development Program/project in order that it may be adjusted where necessary. In other words, it is an assessment of the functioning of the project activities both:

- In the context of implementation schedule and
- In the use of project inputs by the project in the context of design expectation i.e. assessment of the program's/ project's physical and financial performance and impact on the target population and area.

Although M&E are two separate activities they have a complementary function in development programs/projects. Particularly in practice the difference between monitoring and evaluation (on-going) is not always clear. (Table 11.1 summarizes the difference between M&E.)

Table 11.1: Major Differences between Monitoring & Evaluation (Kebede, 2003)

Objectives	Monitoring	Evaluation
Reference Period/Frequency	<ul style="list-style-type: none"> ▪ To determine the efficiency & legitimacy of the application and use of inputs as well as their conversion into outputs. ▪ To facilitate an adjustment of activity plans, time schedules or budgets 	<ul style="list-style-type: none"> ▪ To determine whether the objectives set were realistic, given the capacities with which and the circumstances in which they had to be fulfilled ▪ To undertake review of things done, i.e., to assess the impact of the project activities
Primary Users	It is a tool for project managers to use in judging and influencing the progress of implementation	Results are used by funding agencies and other relevant institution in future programs /projects design
Data Gathered	Primarily quantitative	Primarily qualitative

In spite of these differences, there are common features that highlight the relationship and complementary between them. In many cases:

- Both M&E use the same data collection and analysis system
- The indicators for monitoring may be included in the range of information required for evaluation, but they will be reviewed over a longer span, with the use of comparative analytical techniques.

Table 11.2: Complementary Features of Monitoring & Evaluation

Monitoring	Evaluation
<ul style="list-style-type: none"> ▪ Implementation Oriented ▪ Tracks results ▪ Assess intermediate results ▪ Focus on timeliness ▪ Emphasis on multi-level results ▪ Informs budgeting ▪ Strengthens accountability for managing results ▪ Essential for program implementation & improvements ▪ Can use disaggregated data 	<ul style="list-style-type: none"> ▪ Policy Oriented ▪ Explain results ▪ Assess attributes ▪ Focus in rigor ▪ Emphasis on final results ▪ Informs broad resources allocation ▪ Strengthens accountability for results themselves ▪ Essential for strategy development ▪ May need aggregated data

Source: USAID/Ethiopia, Performance Monitoring Workshop Handout, March 1997.

Activity 11.1: Briefly discuss on the differences and similarities between project monitoring and evaluation.

11.2: PROJECT MONITORING

Creating a system of control and accountability, which can provide rapid feedback to policy makers, planners and managers on the performance and potential problems of development programs and projects are very crucial. Adequate project preparation includes not only detailed engineering design, financial and economic analysis, but also the ways and approaches used for timely monitoring the overall performance.

Practically every development program/project undertakes monitoring both the achievements of its targets (physical and financial) and the benefits actually accruing to its target group. Monitoring is a tool for project managers to use in judging and influencing the progress of implementation. Managers have the responsibility for deciding the tactics for implementation within the strategy laid down in its documentation.

What do we mean by project monitoring and what it is for? A number of definitions have been put forward for this term. Meredith and Mantel (2006) define monitoring as "the continuous and systematic collection of information over the life of a project which allows adjustments to be made and objectives to be refined. Monitoring involves setting indicators of achievement or progress and the means of measurement of those indicators. It provides the information on which evaluation is based".

Similarly, ICMR (2007) defines monitoring as "a systematic and continuous assessment of the progress of piece of work over time .It is a basic and universal management tool for identifying strengths and weaknesses in a program. Its purpose is to help all the people concerned make appropriate and timely decisions that will improve the quality of the work."

Other authors also have a little variation in their definition of the term 'monitoring', according to particular needs or understanding of the concepts. Nevertheless, they all show

broad agreement on why monitoring should be undertaken and what its use is within a development project.

In summary, monitoring can be defined as a continuous assessment of both the functioning of the project activities in the context of implementation schedules and the use of project inputs by targeted populations in the context of designed expectations. It is an internal project activity, an essential part of good management practice, and, therefore, an integral part of day-to-day management. The term has a close meaning with control and supervision.

11.2.1: FUNCTIONS OF MONITORING

As stated above, monitoring is a management tool that contributes to effective and efficient implementations. Managers and donor representatives, responsible for monitoring, should be open to modify original plans during implementation, if such action seems warranted. Therefore, monitoring must be integrated within the project management structure.

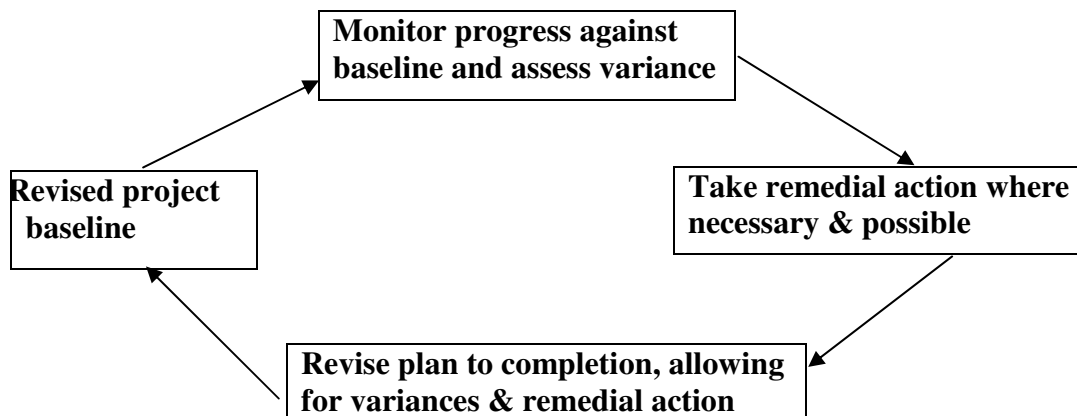
Monitoring is an evaluative activity. By comparing what has been accomplished to targets set up in advance for a given time period, monitoring identifies shortcomings before it is too late. It also provides elements of analysis as to why progress fell short of expectations, identifying constraints and pointing the way toward measures to overcome them.

Monitoring may be used to adjust specific objectives and revise the work plan during the current period and for the next reporting period. This does not mean that objectives should be changed lightly. But when monitoring signals that something is off course (derail), a careful review of the situation should be undertaken to assess if a modification of objectives is merited. Adopting a flexible planning style is usually more successful than following original plans rigidly because unexpected opportunities as well as obstacles often arise. In many cases where the objective is a change of behavior, it is impossible to accurately predict people's reaction to interventions. Hence, monitoring and subsequent adjustments of activities are essential.

11.2.2: FOCUS AND TYPES OF MONITORING

Monitoring is the provision of information and the use of that information to enable management to assess progress of implementation and take timely decisions to ensure that progress is maintained according to schedule. It assess whether project inputs are being delivered and used as intended. It is a process of measuring, recording, collecting and processing project data for management decision making. In relation to development projects, monitoring focuses on the operation, performance and impact of the project.

Monitoring has the following cycles (Chandra, 1995, 2006; CRDA, 1998; ICMR, 2007; Meredith and Mantel, 2006; Pearce and Robinson, 2001):



The essence of a project monitoring system is the continuous comparison of the actual situation against the plan, in relation to physical progress, financial expenditure and quality. When the monitoring system shows a deviation between the planned progress and the actual progress (known as 'Variance'), project managers need to decide whether remedial action is possible or necessary.

Designing a proper information system is a prerequisite for effective project monitoring. The function of the information system (often called the project management information system-PMIS) is to provide managers with the information on which they can take timely action in pursuit of project activities. Information is passed from the project site to the managers who use it to monitor project progress against plan. If deviations have occurred and modifications to the plan are required, these are instituted through the control system, and the consequent deviations are passed back to the team at the project site using the established communication system.

Too often, in public sector project administration, monitoring system is considered only as a means of centralized checking and recording, particularly focusing on financial performance. Project managers instead of using the system to help them manage their project activities more efficiently, it has been observed that the information collected on their project monitoring is transmitted to the head office. It should be noted that monitoring is an internal process and has to be carried out by managers and project internal staff, for managers as part of the effective implementation of projects. Those involved must look on the management systems as being assistance to them in the carrying out of their own duties rather than as something required by others for different purposes.

While all monitoring data need to be processed to provide information, managers should use that information to guide them to take action only where necessary. The data will provide information on which it will be possible to compare actual progress against the plan. Areas of concern are those where there are substantial deviations from the plan (i.e., Management by Exception). The manager will then be concerned to assess the implications of these deviations. Managers do not need to take action on monitoring information except in those situations where the information shows substantial deviations between planned and actual progress.

a) Project Monitoring Systems

In managing development projects, it is essential for the manager to:

- Further specify the project objectives as a basis for preparing a detailed implementation strategy,
- Develop appropriate activities and delivery systems and determine the required inputs and outputs,
- Prepare realistic work plans and schedules, keeping in view the available resources and staff capabilities,
- Maintain detailed records of physical and financial performance,
- Monitor the project environment so that it can facilitate project implementation or suitable adjustments can be made in ongoing or planned activities, and
- Provide periodic reports to the responsible agencies and institutions (Chandra, 2006; Joy, 1993; MEDAC, 1996).

Management personnel at various levels of project hierarchy need timely and relevant information to undertake these functions. Thus, in order to implement a project, the manager needs a regular flow of information on the resources (staff, equipment, money, etc) deployed and deployable, the stage of preparation of infrastructure and services, the availability of supply and inputs, the contact with targeted beneficiaries and their reactions to the stimulus offered by the project and the environment as it affects the implementation of the project.

The range of required information for monitoring can be divided into three main types (Chandra, 2006; ICMR, 2007; Kebede, 2003; Pearce and Robinson, 2001):

- i. Information pertaining to the physical delivery of the structures and services provided by the project, together with the relevant financial records.
- ii. Information pertaining to the use of the structures and services by the targeted population and the initial consequences of that use.
- iii. Information on the social, economic or environmental reasons for any unexpected reaction by the target population that is revealed by the information about the use of structures and services.

In general, the monitoring system depends on the definition of the project plan through the identification of project targets to be achieved at a particular time. These targets describe the quantified objectives of the project at a particular time. For effective monitoring, it is necessary to set physical targets for outputs as well as financial targets (budgets) for inputs and progress can be measured directly against these targets. When we say inputs, we refer to resources provided for an activity, and include cash, supplies, personnel, equipment, training, etc., where as outputs are the specific products, goods or services that an activity is expected to produce/deliver as a result of receiving the inputs.

b) Type of Monitoring

Development programs /projects are often carried to bring change on people and their surroundings. These may be economic, social, organizational, technological, etc. or other intended or unintended results over a longer period. Monitoring that considers this change is called **impact monitoring**.

The following are the items that have to be closely monitored in development programs/projects (CRDA, 1998; Cusworth and Tom, 1993; ICMR, 2007; Meredith and Mantel, 2006):

- **Program/physical progress**
- **Financial Progress**
- **Beneficiary contact Monitoring**
- **Management/Administration**

A distinction has to be made between process monitoring and impact monitoring. Monitoring that involves about the use of resources, the progress of activities, and the way these are carried out is a process monitoring. It is a means for reviewing and planning work on a regular basis.

Although detail consideration is given for program/physical, financial progress and beneficiary contact monitoring, summarized information will be provided for management/administration monitoring in **Table 11.4**.

i) Program/Physical Progress Monitoring

Monitoring program/physical progress is a vital element of successful project implementation. It is generally accepted that projects that are implemented on time have a much better chance of being implemented within budget than those that suffer delays. Physical progress monitoring should, therefore, be directed to assisting the managers and owners of the project in keeping a check on whether activities in the project are up to schedule. If they are not, managers need to be able to assess how significant the delay is, and whether remedial action needs to be taken. Managing physical progress can be likened to managing time.

The simplest method of physical progress monitoring is by means of project milestones. Milestones are significant events in the implementation program, for example, the event marking the completion of various critical activities. Completion of the tendering process and the award of contract is often a very important milestone for resource-intensive projects with major physical components. Failure to achieve milestones by the appropriate date signals to the management that problems are likely to occur in the future, and that remedial action may be necessary.

The number and type of milestones used for project monitoring will depend on the level of management that wishes to use them. Top management will be concerned with a few key milestones that will indicate progress on the project as a whole. These milestones are likely to represent important dates in major activities or complete components of the project.

Middle management will be concerned with more milestones, at more regular intervals, and relating only to that part of the project for which they are responsible. Line supervisors will be concerned with the achievements of detailed milestones, at frequent intervals, for one specific activity.

Identifying appropriate milestones is a matter of judgment. If, however, Critical Path Method (CPM) is used to plan project implementation, the project network and time charts are useful aids in this respect. When identified, the milestones can be marked up. This is commonly done on the **bar chart**.

An effective monitoring aid using milestones is the milestone chart (see table below). It shows, for each project, the milestone, the originally planned date, the revised planned date, and the achieved date.

Table 11.3: Milestone Chart

Milestone	Original Plan	Revised Plan	Date Achieved
Award Tenders	April 2000	-	April 2000
Completion of Buildings & Physical Facilities	Sept. 2000	Dec.2001	
Completion of Staff Recruitment and Training	Oct.2000	Jan. 2001	
Completion of Pilot phase	Jan. 2001	April 2001	

Monitoring using milestones concerns the occurrence of key events and only signals when problems have already happened. It does not help managers to anticipate problems. To help anticipate problems, it is necessary to use measures of physical progress which are regularly reported during the activity and which help the project manager to look forward to assess whether future milestones will be achieved on time or not.

The other items to be considered during program/physical monitoring are:

- Results of activities/project outputs
- Project inputs
- Progress of program according to objectives
- The way the program is managed and style of work
- Background information on target population and context

Information to be collected, sources and use of information on the above items are summarized and presented in **Table 11.4**.

Activity 11.2: Discuss on the rationale for project's physical progress monitoring in brief with an illustration.

ii) Financial Progress Monitoring

Managers are also concerned to measure financial progress, both to relate it to the total project budget and to ascertain the costs of individual items and activities within the project and how these compare to the original estimate. This process also requires the preparation of financial plan (budget) for the project, and subsequent measurement of actual expenditure and comparison against budget.

Once the budget has been prepared and the project is underway, the project manager will need a cost reporting system to provide information on actual costs. Unfortunately it is often not possible to rely directly on the accounting system to do this, for a number of reasons.

- The accounting system is likely to have been established prior to the project and to be used for many other activities of the sponsoring ministry or organization. It is thus unlikely to record costs for individual items in the way that the project manager would find useful.
- Accounting system is often slow so that costs are recorded and reported several months after they are actually incurred, too late to allow corrective action if variances are observed.
- Accounting systems do not record costs committed but not yet incurred.

For instance, costs that are committed on the signing of a contract may be a main element in the overall buildup of costs. Project managers will, therefore, need to establish a cost reporting system that provides the information required (costs incurred and committed, for each item and activity in the work break down structure) in a timely fashion, say within a month.

Activity 11.3: Discuss on the rational for project's financial progress monitoring in brief with an illustration.

iii) Beneficiary Contact Monitoring

Physical and financial monitoring generally measures a project's provision and delivery of services and inputs. However, as a program/project is implemented, the perception of its intended beneficiaries will lead either to growing demand for its outputs/services or to its increasing irrelevance. Hence, in project management it is important to know whether the outputs/services provided are being accepted by the intended beneficiaries and how they are being integrated in to the existing systems (e.g. farming systems, education systems, etc.) or not. This can be done through beneficiary contact monitoring.

Beneficiary contact monitoring requires that project beneficiaries can be identified. This is possible in most development projects. Because project preparation and appraisal reports generally specify intended group of beneficiaries -whether by location, type of activity, eligibility for services or willingness to use project's inputs or techniques- and give working estimates of their number.

Three techniques can be used to keep track of beneficiaries' attitudes and behaviors:

- To maintain records for each participant/beneficiary/ and to analyze these periodically to monitor the penetration of the outputs/services and the establishment of clientele.
- To establish a regular schedule of surveys to enable managers to measure the progress of a project and the responses of its beneficiaries. Formal sampling techniques must be used to get satisfactorily significant data from these surveys.
- To use normal interviews to alert managers to outstanding success stories or problems.

Monitoring staff can develop many useful insights by talking to project beneficiaries and summarizing their comments. The monitoring staff has the primary responsibility for initiating and maintaining contacts with beneficiaries. They must also keep the project records well organized and will usually conduct interviews if sample surveys are needed.

Furthermore, beneficiary contact monitoring should answer the following basic questions (CRDA, 1998; Cusworth and Tom, 1993; Cuury and Weiss, 1993):

- Who has access to project services and inputs?
- How do they react to these stimuli?
- How do these stimuli affect their behavior and performance?
- To what extent did persons with access understand the available services form the project?
- To what extent did those who saw them as relevant try the services?
- Did those who tried the services continue using them?

It is important to note here that the monitoring of the initial effects of a new output/product on the behaviors and performance of beneficiary groups extends the monitoring system to one more level of detail-namely the initial outcome of the use of project outputs/services in terms of physical output or economic effect. This is a kind of monitoring that resembles to what is called on-going evaluation. It will be discussed broadly later during our evaluation session.

Proper approach has to be used during beneficiary contact monitoring. For many aspects of beneficiary contact monitoring, simple interviews with a small sample of beneficiaries will provide adequate indicators of project penetration, adoption, and response if the sample is drawn according to randomization procedures. It is strongly recommended that probability sampling be used in monitoring the proportion of beneficiary population that exhibits pertinent characteristics. **Table 11.4** Summarizes the major information required for monitoring, from where it would come and how it could be used.

Activity 11.4: Explain the rational for project’s beneficiary contact monitoring in brief with an illustration.

Table 11.4: Major Information Required for Monitoring, Sources, and Use of Information (Kebede, 2003)			
I. Management/Administration Monitoring			
Items to be Monitored	Information to be Collected	Sources of Information	Use of Information
1. Staff/Personnel Issues	<ul style="list-style-type: none"> • Performance • Achievement • Absenteeism • Problems • Expectations • How staff work as team • Whether staffing structure work, etc. 	<ul style="list-style-type: none"> • Staff/team meetings • Staff reviews • Supervision • Informal meetings • Observation, etc. 	<ul style="list-style-type: none"> • Give staff support and feed back. • Training and staff development • Improve management practices • Modify/clarify job Description, etc.

2. Vehicles	<ul style="list-style-type: none"> • Fuel Consumption • Mileage • Repairs • New parts, capital & running costs • Performance, etc. 	<ul style="list-style-type: none"> • Log book of fuel and mileage • Record sheets of repairs spare parts fitted • Records of money spent on each vehicle • Meetings with drivers • Observation, etc 	<ul style="list-style-type: none"> •Decisions about replacing old vehicles when they become uneconomical to run. •Compare different makes of vehicles •Check mechanic performance •Identifying problems, e.g. excessive fuel consumption.
3. Supplies	<ul style="list-style-type: none"> • When to obtain supplies • Cost from different suppliers • Stock levels • Items about to run out 	<ul style="list-style-type: none"> • Suppliers, catalogues, inventory stocks, etc. • Stock keeping record system, etc. 	<ul style="list-style-type: none"> • Obtain best value supplies. • Obtain supplies on time • Maintain adequate stock levels, etc.
II. Finance			
Items to be Monitored	Information to be Collected	Sources of Information	Use of Information
1. Project Budget & Expenditure	<ul style="list-style-type: none"> • Expenditure by project • Expenditure by budget head • Balance of budget remaining this year • Regularly recurring items of expenditure, e.g. rent, • Previous years budget and expenditure • Rates of inflation • Exchange rates, etc. 	<ul style="list-style-type: none"> • Invoices & vouchers • Budget breakdown • Analysis of budget and expenditure, e.g. using computer spread sheets 	<ul style="list-style-type: none"> •Predict expenditure for budgeting •Compare costs of different projects •Identify areas of excessive expenditure, identify any savings •Compare costs with project achievements to assess cost-effectiveness
2. Staff salary	<ul style="list-style-type: none"> • Salaries • Tax, insurance, etc. • Annual increments • Final pay • Other payments, e.g. health allowance, staff bonus, etc. 	<ul style="list-style-type: none"> • Staff records • Pay slips • Salary records 	<ul style="list-style-type: none"> •Ensure staff are paid according to pay scale reflecting nature of job and length of service •Ensure other payments are made according to correct procedure •Ensure all staff know what benefits they are entitled to
3. Cash Flow Analysis	<ul style="list-style-type: none"> • When is cash needed for the project? •Where will cash come from? • What and when are cash outgoings? 	<ul style="list-style-type: none"> • Cash record system 	<ul style="list-style-type: none"> •Ensure sufficient but not excessive cash is available

III. Program/Physical Monitoring			
Items to be Monitored	Information to be Collected	Sources of Information	Use of Information
1.Results of Activities/ Project Outputs	<ul style="list-style-type: none"> • What has been done? • What has not been done but was planned? • What problems have been encountered? • How the problems have been addressed? • How the external situation has changed? • Any other relevant information to work on the project 	<ul style="list-style-type: none"> • Regular records of activities • Supervision reports • Periodic reports • Meetings, workshops with staff, project partners and people affected by the program • Staff reviews • Newspaper, radio • Informal discussions • Observation • Surveys 	<ul style="list-style-type: none"> • Plan future work • Identify project successes • Identify opportunities to build on strength • Identify problems and weaknesses, plan strategies • Review priorities • Identify training needs • Identify needs for further information or research, review or evaluation
2. Project Inputs	<ul style="list-style-type: none"> • What is needed and Where it can be found • When it is needed and when it will be available • Cost 	<ul style="list-style-type: none"> • From suppliers, other organizations, government, etc. 	<ul style="list-style-type: none"> • Plan and schedule activities • Monitor costs and budget accordingly
3. Progress of Program According to Objectives	<ul style="list-style-type: none"> • Progress towards achieving objectives • Are objectives still relevant? 	<ul style="list-style-type: none"> • Information about key indicators • Observation 	<ul style="list-style-type: none"> • Modify strategy and/or objectives if necessary • Feedback • Identify need for review and evaluation • Identify need for further information or improvements in monitoring system
4. The way the program is managed, style of work	<ul style="list-style-type: none"> • How are decisions made? • Are the people who are supposed to be involved really involved? • Do the partners/people affected by the work/program staffs feel a sense of ownership of the program? 	<ul style="list-style-type: none"> • Indicators which show degree of participation • Meetings, discussions • Observation 	<ul style="list-style-type: none"> • Show need to change management style • Identify need to change methods to encourage more participation • Identify problems in relationship between partners/people affected by the program/staff and address them
5. Back-ground information on target population and context	<ul style="list-style-type: none"> • Have there been any significant political, economical, or environmental developments affecting target population? • Have there been any developments affecting the program? • How is the population changing in terms of the characteristics the program is hoping to influence? 	<ul style="list-style-type: none"> • Surveys • Sources of information about politics, economics • Meetings with other agencies, government officials • Observation 	<ul style="list-style-type: none"> • On-going collection of baseline data which can be used to evaluate progress • Response to changing situations, rapid response to emergencies • Keep in touch with relevant work by other agencies

Activity 11.5: Explain what it means by project's "Management/Administration Monitoring" with an illustration.

11.2.3: ORGANIZATION FOR MONITORING

As it is discussed above, monitoring encompasses the collection of recorded project data and supplementary information for the analysis and interpretation required to make decisions concerning the functioning of the project. Thus, establishing M&E unit within the project is vital. Particularly to serve as a management tool, monitoring system that fit the management system should be organized at each level of management. Nevertheless, in order to effectively use the system, the following issues should be properly considered (ICMR, 2007; Joy, 1994; Meredith and Mantel, 2006; Pearce and Robinson, 2001):

- a. Decentralized management, i.e., management decisions taken as close as possible to the activity. Management from a distance does not motivate personnel, can only react slowly to changing needs and situations, and does not encourage an economical use of resources.
- b. Management by objectives, i.e., managers should not merely perform and oversee the performance of specified activities, but should be most interested in their outcomes and impact.
- c. Community participation, i.e., development of community participation in certain activities into community responsibility for these efforts. Ideally, consultation between local government workers and community members should lead to the community assuming greater responsibility for an effort e.g. through a management committee in a health center, school construction, road construction, local resource management, etc.

The staff of M&E unit can contribute, among others, in the following activities:

- Sort, summarize and disseminate the information flowing from the various units and staff engaged in implementing the project.
- Analyze the administrative files and records pertaining to the project implementation.
- Collect and analyze data from the intended beneficiaries of the project to supplement the available records and reports.
- Identify problems being encountered by the project and conduct diagnostic studies bearing on these problems.
- Maintain in a retrievable format the various data series overtime as an aid to later evaluation
- Prepare reports that highlight the findings of the various analysis and to the extent appropriately present a range of logical options required decisions by the management of the project or other concerned body (Chandra, 1995, 2006; Cuury and Weiss, 1993; Joy, 1994; Meredith and Mantel, 2006, Pearce and Robinson, 2001).

Although it is not limited to these, the monitoring functions can cover the above functions. In general, the manager is in charge to monitor the overall project environment in order that suitable adjustment can be made on the project objectives, assumptions, implementation strategies and procedures of the on -going or planned activities so that it can facilitate project implementation. In other words, matters requiring the attention of, and action by, the project management or authorities at the higher level must be brought timely to the attention of the project manager and through him to the concerned higher authorities.

11.2.4: INDICATORS SELECTION

Selection of indicators that will be used to judge project progresses and achievements is critical to conduct M&E. If appropriate indicators are chosen, they help M&E by (Chandra, 2006; Cusworth and Tom, 1993; Cuury and Weiss, 1993, DEPSA, 1990; MEDAC, 1996; UNIDO, 1991):

- Showing the prevailing progress and problems in project implementation.
- Revealing the nature and rate of change that has occurred or appears to be occurring.
- Enabling progress to be compared with the planned targets.
- Assisting in input-output and cost-benefit analysis.

What is an indicator? An indicator can be defined as an objective measure of change or results brought about by an activity or an output from an activity. Indicators can be used to measure progress of all sorts within a project, broadly relating to the process and the impact of implementation. Its two major components are (Kebede, 2003):

- a) **Process indicators** are those, which show whether the planned activities are actually being carried out effectively.
- b) **Impact indicators** are used to assess what progress is being made towards reaching the project's objectives and what impact the work has had on the different groups of people affected by the work.

Activity 11.6: Explain the rational for project's impact and process monitoring in brief with an illustration.

Choice of appropriate indicators is a task that requires experience and skill, a thorough understanding of the information needs of management at various levels, knowledge of how best to obtain the data for the indicators and of the limits imposed by both costs and techniques. For example, household income data as an indicator of living standard is notoriously difficult to collect and highly unreliable. For this reason, if it is used at all, it should be supported with related data, of which ownership of visible assets, such as house and consumer durables. Similarly deforestation rate may be a suitable indicator for monitoring forest area coverage in countries/regions/ with effective land use plan and cadastral system. It may be quite unsuitable for project monitoring where this system doesn't exist and/or where the data must be obtained from survey.

Project mangers guide the choice of indicators for monitoring purpose by deciding what they need to know. Some indicators are especially important because they illuminate matters that the project managers can influence to improve project performance. However, the list of indicators has to be limited. Otherwise as the list grows large, so does the number of inappropriate indicators, which can doom an information system.

Indicators can be quantitative, measuring tangible effects, or qualitative, dealing with concepts which are less easy to pin down. Recognition of the relative strengths and weaknesses in quantitative and qualitative approaches to M&E work is important in deciding the most appropriate mix of methods or techniques to be used in any given situation.

Indicators essentially develop from objectives. Therefore, objectives whether short term, intermediate or long term, need to be stated clearly and unambiguously. If a direct indicator cannot be found which can be measured accurately at a reasonable cost, a proxy indicator that can be measured should be sought. **Table 11.5** presents an example of direct and proxy indicator.

Table 11.5: Direct and Proxy Indicators (Kebede, 2003)

Project Objectives	Direct Indicators	Proxy Indicators
Increased Agricultural Crop Production	<ul style="list-style-type: none"> ▪ % Increase in the yield of any of the major cereals grown in the project ▪ % Change in overall crop production per household 	<ul style="list-style-type: none"> ▪ % Increase in fertilizer use ▪ % Increase in the use of improved seeds ▪ % Increase in irrigated area ▪ % Increase in the adoption of improved practice
Increased Household Income		<ul style="list-style-type: none"> ▪ % Increase in number of livestock (expressed in value terms) ▪ % Increase in savings ▪ Improvement in physical state of the household (i.e. tin roof, additional rooms, etc.)
Improved Health Status in Target Area	<ul style="list-style-type: none"> ▪ Reduced prevalence of diarrhea diseases ▪ Decreased % of children who are under-weight 	<ul style="list-style-type: none"> ▪ % Increase in families using family planning methods ▪ % Increase in households using protected water source ▪ % Increase in households with a vegetable garden for home consumption ▪ % Increase in deliveries attended by trained target areas

As we already discussed indicators are designed to provide a standard against which to measure, or assess the progress of an activity against stated targets, towards delivering its inputs (input indicators), providing its outputs (output indicators) and achieving its objectives (effect and impact indicators).

Let us consider a program, which is devised to introduce new extension packages to peasant agriculture to understand the distinctions between input, output, effect, and impact indicators. One of the main objectives of the program is to attain food self-sufficiency. Some of the main activities of the packages include (Cusworth and Tom, 1993; Cuury and Weiss, 1993; Gittenger, 1996, 1998):

- Improving extension agent to farmer ratio
- Expanding the use of improved farm technologies like fertilizers, improved seeds and plant protection chemicals
- Expanding application of soil and water conservation measures
- Improving crop management practices

In such a situation,

(a) Examples of input indicators will include:

- Increase in the number of extension agents
- Increase in the delivery of fertilizers, seeds, pesticides, oxen and other technological inputs
- Change in the volume of credit made available to farmers
- Change in the number of trucks allocated to transporting inputs

(b) Examples of output indicators will include:

- Increase in area under crop and forage production
- Increase in food production

(c) Examples of effect indicators will include:

- Increase in yield per hectare for target crops
- Increase in livestock productivity
- Percentage increase in the number of farmers who adopted the extension packages

(d) Examples of impact indicators will include:

- Increase in asset ownership
- Increase in land holding
- Change in the constitution of diet
- Change in weight in relation to height in children

The choice of basic indicator should be both sub-sector and project specific. What is appropriate for one project is not for another, and what can be measured in one environment cannot be in another.

There are a number of criteria that are considered to contribute to effective indicators. These are (CRDA, 1998; Cusworth and Tom, 1993; Cuury and Weiss, 1993, MEDAC, 1996):

- | | | |
|----------------------------------|----------------------|-----------------|
| - Simplicity | - Validity | - Specificity |
| - Independence | - Relevance | - Timeliness |
| - Accessibility | - Cost effectiveness | - Verifiability |
| - Meaningfulness to all involved | - Sensitivity | |

Simplicity/Unambiguous Definition

The indicator must be simple and clearly defined in the project's context. For example, what does an 'adopter' of a project -supplied input such as fertilizer mean? Does it include all farmers who bought the fertilizer or farmers who apply it but less than recommendations call for or only farmers who follow the input recommendations? Adoption rates are highly recommended indicators in agricultural projects, but they must be clearly defined.

Validity/Consistency

The values of the indicators should stay valid/constant as long as they are collected in identical conditions, no matter who does the collecting. As far as possible, indicators should be chosen to give objective rather than subjective data.

Specificity

Indicators should measure specific conditions that the project aims to change. Specificity usually decreases along the path from inputs, outputs and effects to impact. For example, the delivery of inputs within a defined area is specific. A changed deliver rate reflects a real change in project's implementation. Crop output, however, is a less specific indicator, since outside factors may have greater influence on total production than the project. An indicator is especially valuable to project officials if it clarifies possible corrective action.

Sensitivity

Indicators should be highly sensitive to changes in a project situation. For example, the managers of a project that provides a new seed to smallholders need to monitor the seeds' adoption rate. Short-term movement in this rate in the early years could reveal whether or not farmers favor the seed-a critical monitoring indicator.

Cost-Effectiveness/Ease of Data Collection

The collection of the data needed to calculate the chosen indicators should be within the capability of a limited team. The fact that an indicator is believed to be important does not mean that it is practical to measure it. But the results should be worth the time and money it costs to apply them.

Relevance

It should be relevant to project objectives.

Timeliness

The indicator should be sensitive to the time it is done and possible to collect the data reasonably and quickly.

The criteria for selecting indicators for monitoring also apply to evaluation. However, the following additional observations about indicators for evaluation are appropriate (Cusworth and Tom, 1993; Cuury and Weiss, 1993; Gittenger, 1996, 1998; Kebede, 2003):

- Some indicators are slow to change and, therefore, have limited value for normal project evaluation. For example, infant mortality remains still a valuable indicator for all developing countries, as it was a useful indicator for health and nutrition in Western Europe many years ago when communicable disease was high and life expectancy was low.
- Appropriate indicators for evaluating a project should be determined at the design or early implementation stage so that arrangements can be made to collect the necessary data. The main criterion for these indicators is that they should be sensitive to project induced change and measurable with out the need for continuous, complex observation of large samples.
- The number of indicators should be kept to a bare minimum. Most of the indicators used for monitoring can also be employed for evaluation, but they must be analyzed for a larger period.
- Evaluation should not and cannot always depend on quantitative indicators. The purpose of evaluation is to generate in-depth understanding and not mechanically to report progress or the lack of it. Therefore, qualitative indicators should be used to evaluate social consequences in particular.

Activity 11.7: Set three indicators to monitor a project's physical construction progresses.

11.3: PROJECT EVALUATION

We have seen earlier the concept and definition of evaluation. It is closely related with monitoring and draws on the data base created during the monitoring process, supplemented if necessary with data on project impact, and reviewing the combined information over an extended period to judge the achievements. Indeed both M&E functions differ from project to project depending on the type of project, its objectives and components.

Evaluation can be seen in two ways, i.e., in periods of evaluation and persons evaluating. In terms of the periods of evaluation, four types of evaluation may be distinguished. These are (Chandra, 1995, 2006; CRDA, 1998; Cusworth and Tom, 1993; ICMR, 2007; Joy, 1994; Kebede, 2003; Meredith and Mantel, 2006):

- **Ex-ante evaluation,**
- **Mid-term or on-going evaluation,**
- **Terminal evaluation, and**
- **Ex-post evaluation.**

a) Ex-ante Evaluation (Pre feasibility, Baseline Data, or Situational Analysis)

It is carried out before the implementation of the program/project activity in order to determine the needs and potentials of the target group and its environment, and to assess the feasibility, potential effects and impacts of the proposed program or project. For projects, which aimed to develop infrastructures (and to all others too), this can be looked as a "base line" study in which the situation of project area, the target group and its environment is described. At a latter stage the effects and impacts of the Program or project can be compared with this situation.

Activity 11.8: Explain the rational for project's ex-ante evaluation in brief with an illustration.

b) Mid-term or On-going Evaluation (Progress evaluation)

This type of evaluation takes place while the implementation of the planned project is on-progress. Its primary focus is on project performance. It is an analysis of the relation between outputs and effects. What distinguishes it from later evaluations (terminal and ex-post) is that correction to the current project still can be made on the basis of findings and recommendations. This may lead to a redefinition of objectives or a change in implementation strategies. Unlike monitoring, on-going evaluation does not deal with daily problems but produces periodical assessment. It is an important evaluation tool for project success since it would provide an opportunity for corrections on some mistakes observed on the implementation process. This means that it can lead to suitable modifications in the project design and implementation strategies. The major items covered include (CRDA, 1998; Cusworth and Tom, 1993; Cuury and Weiss, 1993):

- Organization structure and management capacities of the project.
- Progress and problems in staff recruitment and placement
- Procurement of necessary work goods and services from national and international sources (In many projects, procurement delays are a major obstacle to effective implementation).
- Progress in establishing delivery systems for supplying the necessary inputs and services
- Progress in physical work (construction).
- Volume and quality of inputs and services made available.

Note that at this stage evaluators will not be able to assess the effects and impacts of the project.

Activity 11.9: Discuss in brief the rational for project's progress evaluation with an illustration.

c) Terminal Evaluation (Phase out or Completion Report)

It is conducted when the funding for the project comes to an end. This may not mean that the services and inputs being supplied by the project terminate. But it is assumed, in most cases, as the responsible institutions or the beneficiaries will handle them. The distinguishing features of terminal evaluation are:

- It takes longer time for review of the initial outputs and effects
- It undertakes a careful examination of performance
- It assesses the sustainability of the benefits accruing to the target area/ group from the project and the rate of return on investment is assessed.

In the terminal evaluation, in addition to the project records, documents and outputs, an inquiry should be made for secondary data that are relevant for a comparison. Hence a wide range of data and information gathered from various source should be reviewed. Recommendations from terminal evaluation are primarily directed to improve the planning and design of future projects.

Activity 11.10: Briefly explain the rational for project's terminal evaluation with an illustration.

d) Ex-Post Evaluation (Post Implementation or Impact Evaluation)

It is designed as in-depth studies of the impact of a project that has been already executed or an intervention (support) given for certain development activities. It is made some times (in most cases 5 –10 years) after the program/project activity has been terminated in order to determine its impact on the target group and the local area. We shall discuss in detail on the project impact analysis on the next topic.

On the basis of the evaluating person, evaluation can be classified into internal and external. Persons who have a direct role in the program/project perform **Internal Evaluation**. The management team or persons assigned from the implementing agency can do on-going or mid-term evaluation. On the other hand, persons from outside the program/project carry **External Evaluation**. External evaluators often conduct terminal and ex-post evaluation. In most cases it is conducted by the funding/sponsoring agencies with formally designated persons outside the project at fixed points in time.

Activity 11.11: Discuss on the rationale for project's ex-post evaluation in brief with an illustration.

11.4: STEPS AND CHECK LISTS IN DEVELOPING MONITORING AND EVALUATION SYSTEM

11.4.1. STEPS IN DEVELOPING MONITORING AND EVALUATION SYSTEM

Following are the steps for developing monitoring and evaluation system, developing monitoring tools, developing evaluation tools, and the check list for monitoring and evaluation (Chandra, 2006; CRDA, 1998; Duncan, 1996; ICMR, 2007; Meredith and Mantel, 2006; PMI, 2004):

- Determining the objective of monitoring and evaluation,
- Organize a unit or a team or a person responsible for the M&E,
- Identify and involve key stakeholders,
- Define what should be monitored and evaluated (e.g., inputs, activities, outputs, results, critical assumptions, impacts)
- Determine the priority areas to be monitored and evaluated,
- Identify and indicate key elements, factors, and indicators to be focused on for M&E, determine the type of information needed,
- Design and test the monitoring and evaluation instruments,
- Plan how you will execute the monitoring and evaluation,
- Determine how data will be collected, processed and analyzed,
- Identify and allocate resources (both human and non human) for M&E, and
- Prepare, disseminate and use the monitoring and evaluation report.

11.4.2: STEPS IN DEVELOPING MONITORING TOOLS

- Review expected inputs, activities, and outputs,
- Determine information needs,
- Decide on key elements to be monitored,
- Identify key factors,
- Identify key indicators to be used to measure key factors,
- Decide on the key indicators which should be used in developing the monitoring tool,
- Use key indicators to formulate key questions,
- Check the relevance and validity of the question,
- Pre-test the monitoring tools and improve according to feedback obtained, and
- Distribute the monitoring tools for application and improve further on the basis of field application results.

11.4.3: STEPS IN DEVELOPING EVALUATION TOOLS

- Review project objectives,
- Convert project objectives in to evaluation objectives,
- Identify and list down key factors,
- Select indicators for key factors,

- Determine the key factor that should be used for developing the evaluation tools,
- Utilize the key indicators in formulating key questions,
- Check the relevance of the key questions to the information needs,
- Pre-test evaluation tools, and
- Orient evaluations on the tools and put the tools to use.

11.4.4: MONITORING AND EVALUATION SYSTEM CHECK LIST

Questions to be posed and answered satisfactorily before a monitoring and evaluation system put into operation of any project:

- What are the purposes of the monitoring and evaluation activity?
- What types of information should be collected?
- How will the information be collected?
- What methods of analysis will be used?
- To whom will the monitoring and evaluation findings be presented? How will they be used?
- How will the monitoring and evaluation system be organized? Which agency or institute (organizational unit) will be responsible?
- How many and what type of staff will be involved?
- What will be the cost of monitoring and evaluation? How much of the total project costs should be allocated to the monitoring and evaluation systems?
- How should the monitoring and evaluation activities be financed?
- What are the problems and lessons likely to be learned from implementation of the monitoring and evaluation system?

11.5: PROJECT IMPACT ANALYSIS

Why to analyze impacts?

The main goal of a development project is to enhance the development process of the country in general and improvement of the well being of the intended beneficiaries in particular. During preparation and implementation of a project, considerable financial, technical, manpower and other resources are usually deployed. Hence, in order to mobilize or note additional resources on similar projects in the future, adequate and timely impact analysis should be conducted to know the positive and negative (anticipated and unanticipated) changes occurred as a result of the implemented project. The impact analyses should be undertaken with close contact and consultation with all the stakeholders in the project, such as the targeted beneficiaries, local leaders, community leaders, government agencies and other NGOs working in the project area (Cusworth and Tom, 1993; Cuury and Weiss, 1993; Gittenger, 1996, 1998).

The results (feed back) obtained from the impact analysis could help the project planners to prepare or design new programs and projects which geared to wards more practical, action oriented and problem solving as well as to make a correction on the problems confronted by other similar on-going projects.

How and what to analyze?

Often some government institutions, specialized agencies and NGOs make use of consultants (in most cases foreigners) to assess and analyze their project impacts. These consultants make a 'rapid assessment' at considerable expense and subsequently disappear to be called again when the situation calls for it. On the other hand, the

potential of local project professionals in the concerned institutions remains underutilized. Instead of infrequent, expensive and single shot approaches, project professionals in the institution when appropriately instructed and trained and given the responsibility can gradually build a capacity to hand over a timely impact analysis on a regular basis. They can make available information base for their continuous impact assessment. However, the effort of many institutions in building their own capacity is limited.

Lack of adequate base information, which could help as a reference, is one of the crucial problems facing during the impact analysis. Hence, as far as possible in-depth information at the project area/community level is necessary before initiating development projects. As mentioned on the previous chapter this could be collected at ex-ante evaluation period, If not through a rapid area assessment. The required information includes mainly basic project area and community profiles such as,

- Major occupations,
- Income and expenditure pattern
- Marketing situation in the area,
- Infrastructure development and accessibility, etc before the project is initiated.

One thing we should know here is that much of the information collected may have negligible value during the analysis. But instead of confronting information shortage, it would be advisable to collect more information.

Assessment of the positive and negative impacts of a project must be targeted not only to the specific area situation where the project is physically implemented but also to the over all long-term local, regional and national economic development.

Like that of indicators prepared for monitoring, there is a need to establish a frame work which would facilitate to analyze and appreciate the outcomes or impacts resulted from development projects. Answers for the questions raised can be collected not only from the project implementing bodies but also from the beneficiaries of the project, the local communities, leaders and other concerned bodies. The following is the general framework, which could help you for the impact assessment of a single project (CRDA, 1998; Kebede, 2003; UNIDO, 1991). It can be adapted as required by a particular project under consideration. Note that some of the questions may not be relevant to all projects.

Stage 1: Establishing the activities being analyzed

The first stage in impact analysis is to find answers for the following questions:

- What were the objectives of the project, i.e., what did the project set out to achieve?
- Who were intended to be the beneficiaries and how were they to benefit? (Number and types of people anticipated to benefit from the project, areas expected to benefit, social and economic activities that may be enhanced by the project, special groups expected to benefit, etc).
- What were the main intended inputs from the organizations responsible to implement the project, from the project beneficiaries and other supporting bodies, i.e., contribution in gaining capital, technical support, labor and material contribution, etc for the project activities?
- What was the implementation plan?

Stage 2: Analysis of implementation

At this stage we consider what actually happened to the program/project and any problem that arose. These are:

- Were the inputs provided as planned from all sources? How they were delivered (both in quantity and time)?
- Were the work schedules and timetables adhered or were there delays in implementation?
- Has the management of the project been adequate?
- How the project did costs (capital and operating) compared with those foreseen at appraisal?
- What problems, if any, caused delay in implementation and what were the consequences of the delay?
- Overall, what were the strengths and weaknesses of the project both in planning and implementation? Etc.

Stage 3: Assessing project achievements

Here we look at what the program/project actually achieved vis-à-vis its original objectives. Among the points to be considered are:

- Did the project achieved its main objectives, i.e., have outputs been achieved as expected?
- Did the objectives change during the life of the project?
- Who were the main beneficiaries?
- Did they actually benefit from the project's output?
- What was the level of the beneficiary community's involvement in supporting the project?
- What capacity the beneficiaries develop in exploiting the economic potentials of their area? Such as raw materials available, local skills, markets, etc.
- Was there any networking created by the project with other Communities in the area and/or outside the area (production, marketing and other linkages established)?
- What changes were observed among the beneficiaries? This could be economic benefit and/or social changes. As experience shown, infrastructure projects especially rural road construction is dominantly labor intensive or they are more concentrated in employing more labor than machineries. In assessing their impacts on the area, we have to ask as how and how many jobs are created by the project. This could help us to understand the possible jobs that could be created which in turn help project planners to choose in the future those projects with high incremental labor-capital ration (i.e., projects with high labor absorbing capacity).
- Were there unanticipated results of the project either beneficial or harmful? Such as growth in number of crimes, in-migration, etc.
- What were the most important factors explaining success or failure? During project implementation, in most cases, we can confront enormous number of problems. On the course of impact assessment we have to be able to identify the major constraints facing the project. Below are the most common problems we may confront:
 - Inadequate or untimely budget release from the project funding bodies,
 - No or inadequate cooperation from relevant government institutions,
 - Lack of access to important project inputs and services,
 - Inaccessibility to appropriate technology,
 - Lack of skilled and unskilled labor,
 - Inadequate incentives, etc.

Stage 4: Conclusion and recommendation

Finally, findings from the impact analysis have to be brought together and conclusions drawn. Among the points to be considered are:

- What are the key lessons that emerge from the project(s) design and implementation?
- What factors contributed for the success or failure of the project(s)?
- Is there new and particular problem revealed during the project implementation?
- How do the findings compare with those of previous impact analysis (if exist any)?
- What recommendations arise directly from this project for the continued operations of this project or for future similar projects?

Activity 11.12: By taking one project that is completed three years ago in your environment, evaluate if its intended objective is achieved as required.

11.6: MAJOR PROBLEMS OF THE M&E PROCESS OF DEVELOPMENT PROJECTS

While very ambitious demands have been placed on the monitoring and evaluation systems in development projects, many of the methods of designing, organizing, managing and using the systems are criticized for their inefficiency and effectiveness. There are several limiting factors for successful M&E of development projects. The following are the most important mentioned problems (Chandra, 2006; Choudhury, 1988; Cusworth and Tom, 1993; Cuury and Weiss, 1993; Joy, 1994, CRDA, 1998; MEDAC, 1996; Meredith and Mantel, 2006):

- Insufficient awareness of the purpose of M&E and inadequate attention to project implementation. M&E activities are not seen as distinct responsibility in its own and not given proper consideration. People rather feel M&E as faultfinding mission and limit their cooperation for the activity.
- Inadequate or lack of M&E unit and staff both at the project level and higher implementing body. In most cases, M&E system is not either properly established or not provided adequate attention and resources where it exists.
- Poor accountability for failures and inadequate reward for special efforts made on the successful project implementation.
- Limited training opportunity for M&E personnel in projects or offices where the unit exists.
- Limited information source on project progress. Even when information is available, it doesn't answer the right questions. Frequently, where the system exists, it focuses only on quantitative financial aspects and physical implementation of the program\project.
- Late arrival of information required for monitoring.
- Too costly to collect information.
- Disregard of previous M&E findings in the design of new projects.
- High mobility of project staff disrupting continuity of M&E functions.

Activity 11.13: By taking one project that is currently in progress in your environment, briefly explain what its monitoring and evaluation process looks like and discuss the problems therein, if any.

11.7: REPORTING

Reports are tools through which we know what happened or what we got from M&E activities. While monitoring mainly focuses on what goes into a project/program, evaluation deals with what we got out from the intervention. Reporting on the other hand happens both during monitoring and evaluation and is used to determine if the objectives have been met and impacts attained.

Reporting is a systematic activity of processing and distributing information to partners depending on the type of information they require.

Information requirements of stakeholders of an NGO project could be different. What the NGO management, Staff and Board want may be different from what regulatory government agencies, donors, beneficiaries need. Hence, reports have to be tailored according to the needs of users.

Following are the features and types of reports; structure of reports; check list for controlling quality of reports; and tips for successful monitoring, evaluation and reporting, as identified by Meredith and Mantel (2006), Chandra (2006), ICMR (2007) and Pearce and Robinson (2001):

11.7.1: Features and Types of Reports

A report,

- Narrates an event or an activity
- Is a formal way of presentation
- Is prepared for a specific audience
- Explains how the information is gathered
- States why the information is collected and how useful it is
- May include conclusion reached
- May also include recommendation as required

A good M&E report must be well planned, systematic and presented in simple, clear and logical manner. The following points could be useful in preparing M&E reports:

- Define the objective of the report
- Identify your audience
- Know what the audience wants to know
- Determine the time frame for reporting
- Design appropriate data collection tools
- Use good formats for reporting
- Carefully select useful information for your target users.
- State conclusions and recommendations (as necessary)
- Circulate the draft report to get comments for improvements
- Review as necessary and prepare summary of main findings, conclusions & recommendation (if your report is big).
- Distribute to those concerned

Reports could be **informative** containing only facts and figures. Such reports leave the analysis, interpretation, conclusion and recommendation to the users. Another type of report is the **interpretive** report, which includes analysis, interpretation, conclusions and recommendations by the writer of the report.

The above two classifications of report are only general. There are various small categories of reports depending on the purpose of the report and the type of activity or event to be reported on.

11.7.2: Structure of Reports

The structure of M&E reports often depends on what is required, who needs the report and how much information is desired. There could be standard M&E reporting formats by different organizations and bodies. **Generally, full-fledged formal reports have the following structure:**

- Title Page
- Acknowledgment
- Table Of Content
- Executive summary
- Introduction
- Analyses and Findings
- Conclusions
- Lessons learned
- Recommendations
- Attachments (Appendix)
- References

11.7.3: Checklist for Controlling the Quality of M&E Reports

Once the report is prepared, the following checklist could be used to test the quality of the report to make it more relevant for effective decision-making:

- Does the title reflect the contents of the report?
- Have the terms of reference for the report been properly followed?
- Does the report contain the required items?
- Does the introduction clearly state the purposes of the report?
- Are the findings based on the data gathered?
- Are the conclusions based on the findings?
- Is the report divided into related units and sub-units?
- Is the language clear and simple?
- Are all the references fully stated?
- Is the report prepared for the right audience?
- Does the report fit into the capacity of the users?
- Are the recommendations viable, concrete and practicable?
- Is the report attractively presented?

11.7.4: Tips for a Successful Monitoring, Evaluation, and Reporting (M, E, & R) System

A. Improve the collaboration of information sources through:

- Involving the sources in reviewing M, E& R procedure and tools
- Providing orientation on how to use the tools
- Simplifying the approaches and tools
- Avoiding too many questions
- Assuring sources that data will not be used to measure their performance.

B. Provide adequate and continuous training on M, E& R to staff and other to be involved.

- Conduct periodic review meeting on M, E &R
- Retain trained staff

C. Simplify M, E&R tools by:

- Having separate instruments for each of them
- Developing clear objectives
- Prioritizing information needs
- Identifying and prioritizing key factors, indicators and items
- Pick only items which are related to inputs, activities and outputs for monitoring and only items that relate to effects and impacts for evaluation

D. Unload information through:

- Using people who were involved in collecting the data
- Using simplified data processing methods
- Training staff on data processing

E. Create closer contact between data sources and users by:

- Inviting them for consultative sessions
- Arranging frequent visits
- Improving reports and information exchange.

F. Share the results of M, E& R:

- Disseminate the results of M, E &R to all who need to know
- Provide clarification when necessary
- Generate feedback for improvement
- Review M, E&R systems and procedures periodically through the involvement of management, staff, beneficiaries, donors' regulatory organs and others concerned.

11.8: FUTURE OF PROJECT MANAGEMENT

Project management will continue to be a powerful tool in managing changes that are occurring in today's business environment. In the future, we can also expect the discipline of project management to be characterized by strong leadership styles.

The future of project management can be seen from various perspectives. In the future project managers may move closer to the top management, with the elimination of several intervening layers.

Some trends that will enable effective management of future projects are the increasing influence of technology and computers, the changing role of the project manager and demographic and social changes.

Competition in the future will be based more on management styles and technological advantage than on any other functional areas like marketing or finance, and the project management discipline must evolve accordingly.

Project management should be highly flexible and quick in responding to the fast changing market conditions. Information technology has a significant impact on the competitive advantage of organizations and nations, and this too will be reflected in project management.

There is a lot of uncertainty about the future of organizations, and present trends will certainly have an impact on future project management methods.

11.9: CHAPTER SUMMARY

Monitoring is the continuous assessment of project implementation in relation to agreed schedules, and of the use of inputs, infrastructure, and services by project beneficiaries. It provides managers and other stakeholders with continuous feedback on implementation. It identifies actual or potential successes and problems as early as possible to facilitate timely adjustments to project operation.

Evaluation is the periodic assessment of a project's relevance, performance, efficiency, and impact (both expected and unexpected) in relation to stated objectives. Project managers undertake interim evaluations during implementation as a first review of progress, a prognosis of a project's likely effects, and as a way to identify necessary adjustments in project design. The use of mid-term reviews of ongoing projects has spread quickly in the last decade. Terminal evaluations, conducted at the end of a project, are required for project completion reports. They include an assessment of a project's effects and their potential sustainability.

Monitoring and evaluation are an integral part of each phase/step of the project life cycle. There must be measurable goals when the project is defined and measurable milestone in the project plan. During the implementation of the plan, project monitoring and evaluation show to what extent the project implementation has reached the goals and targets; it can be expressed in terms of predetermined and accomplished goals.

Project monitoring and evaluation includes controlling the status of work being performed compared to the plan; volume of work being completed; quality of work being completed; costs and expenditures compared to the plan; attitudes of people working on the project and others who are involved with the project, including customers and management; and cohesiveness and co-operation of team members.

Project monitoring and evaluation is the process of collecting information related to the performance of the system, comparing it with the desired level of performance and taking corrective action to decrease the gap between the actual and the desired performance levels. It is aimed at managing the deviations in cost, time and performance of a project.

Project monitoring and evaluation regulate and control the firm's core assets such as physical, financial and human resources. A project undergoes different kinds of controls during its life-cycle such as controlling the status of cost, performance, schedule and scope of the project, controlling the design of a product or service to ensure that it meets client requirements and controlling the processes and checks for the possibility of any improvements.

A control system should be cost effective. Since it is closely related with the behavior of the humans involved in the project, it should be designed in such a way that it balances the degree of control exercised and the risks involved.

Managers must compare the time, cost and performance of the project to the budget, schedule and the tasks defined in the approved project plan. This must be done in an integrated manner at regular intervals, not in a haphazard, arbitrary way. Any significant departures from the budget and the schedule must be reported immediately, because these anomalies affect the viability and the success of the entire project. This will lead to adapting the project schedule, budget and/or work plan as necessary to keep the project on track. The project progress and changes must be documented and communicated to the team members in a consistent, reliable and appropriate manner for each level of the project team.

The aim of monitoring, evaluation and impact analysis in any project is to facilitate the progress of implementation; assess the performance of projects with respect to the fulfillment of their intended objectives; and to learn lessons there from with a view to improving the design, the developmental impact and the efficiency of future projects. Hence, we should put adequate emphasis on the project monitoring and evaluation tools in order to achieve what we have planned to implement as well as to draw general lessons that will enable us to design future projects that will create long-term development.

11.10: CHAPTER END ACTIVITIES

- a) Assume that an investor residing in your environment has already accepted an implementation's plan and organizing study document to construct two-star hotel prepared by one of the project consultants. However, it is found that the document lacks the monitoring and evaluation standards and related milestones. Therefore, you are requested to prepare the standards and milestones for monitoring:
 - i. Purchasing of construction raw materials
 - ii. Hiring employees
 - iii. Hiring construction machineries
 - iv. Constructing the building
- b) Survey and identify at least two projects, from your environment, that have been completed and implemented three years ago; and study their objectives for which they are intended to attain and their target beneficiaries. Then, make impact analysis in brief to see whether they are achieving their objectives or not.

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