**Chapter two**

**The project Life cycle:**

The different stages/phases through which a project passes is called the ***project life cycle.***

The main features and elements of this process are information gathering, analysis and decision making. The project cycle consist of various stages in which each stage, not only is grown out of the preceding ones, but also leads into the subsequent ones.

There is no single way of devising the different phases of a project there are many equally valid ways in which the project cycle may be divided. There are three basic models of project life cycles they are:

1. **The Baum project life cycle**
2. **UNIDO project life cycle**
3. **DEPSA project life cycle**
4. **The Baum project life cycle (World Bank procedures)**

The first basic model of a project cycle was that of Baum developed in 1970, which has been adopted by the World Bank and initially recognized four main stages, namely

1. Identification
2. Preparation
3. Appraisal and selection
4. Implementation

At a later stage in 1978 the author has added another stage called “Evaluation “thus making the stages 5 in number.

**1. Identification Phase:**

The first stage in the project life cycle is to find potentially promising projects which are worthwhile for investment. Some of the sources of such projects are listed below:

* Some projects are resource based and stem from the opportunity to make profitable use of available resources.
* Some may be market based arising from an identified demand in home or overseas markets.
* Others may be need based and initiated to make available certain basic material requirements and services to all people in an area at minimal amounts.
* Well informed technical specialists and local leaders are also common source of projects. Technical specialists will identify many areas where they feel new investment might be profitable, while local leaders may have suggestions about where investment might be carried out.
* Ideas for new projects also come from proposals to extend existing program.

**2. Preparation Phase:**

Once projects are identified, there begins a process of progressively more detailed analysis of the projects and preparation of the project plans. This phase of the project life cycle which normally includes both the prefeasibility and feasibility study .This is the stage at which the project is being seriously considered as a definite investment action. Project preparation covers the establishment of all the technical, economic, social, financial, institutional and environmental feasibility analyses. From the inferences of such analysis, decisions have to be made on the scope of the project, location and site, soil and hydrological requirements, project size etc. At this stage the project exists as asset of tangible proposals.

**3. Appraisal Phase (an assessment of the quality or value of something)**

At this stage critical review of the project is to be conducted. This provides an opportunity to re-examine every aspect of the project proposal (project plan) to assess whether the proposal is appropriate and sound before large sums are invested. Generally only internal institution/government staffs are used for this work. Projects are appraised both in the field and at the desk level. Appraisals should cover at least seven aspects of the project, each of which must have been given special consideration during the project preparation stage. Those seven aspects are:

* Technical- here the appraisals concentrate on verifying whether the proposed project will work in the way suggested or not.
* Financial- In this, the appraisals try to see whether requirements for money needed by the project have been calculated properly, their sources are all identified and reasonable plans for their repayment are made where necessary.
* Commercial-the way the necessary inputs for the project are conceived to be supplied is examined here and also the arrangements for the disposal of the products are verified.
* Incentive- the appraisals here will see into it whether things are arranged in such a way that all those whose participation is required will find it in their interest to take part in the project, at least to the extent envisaged in the plan.
* Economic- the appraisal here tries to see that what is proposed is good from the view point of the national economic development interest when all project effects (positive and negative are taken into account and check whether all are correctly valued.
* Managerial- this aspect of the appraisal examines whether the capacity exists for operating the project and the people who were assigned responsibilities can operate it satisfactorily or not. Moreover, it tries to see whether the responsible persons are given sufficient power and scope to do what is required.
* Organizational- this appraisal examines the project if it is organized internally and externally into units, contract policy institution, etc., to allow the proposals to be carried out properly and to allow for change as the project develops.

The above issues are the subjects of specialized appraisal report. On the basis of this report, financial decisions are made- whether to go ahead with the project or not. In practice, there can be quite a sequence of project selection decisions. Following appraisal, some projects may be discarded. If the project involves loan finance, the lender will almost certainly wish to carry out his own appraisal before completing negotiations with the borrower. Comments made at the appraisal stage frequently give rise to alterations in the project plan.

**4. Implementation Phase:**

The clear objective of any effort in project planning and analysis is to have a project that can be implemented to the benefit of the society. Thus implementation is perhaps the most important part of the project cycle. In this stage, funds are actually disbursed to get the project started and keep running. A major priority during this stage is to ensure that the project is carried out in the way and within the period that was planned. Problems frequently occur when the economic and financial environment at implementation differs from the situation expected during appraisal.

It is during implementation stage that many of the real problems of projects are first identified. Because of this feedback effect on the discovery and design of new projects, and the deficiencies in the capabilities of the project action can be revealed. Therefore to allow the management to become aware of the difficulties that might arise, in recording, monitoring and progress reporting are important activities during the implementation stage.

**5. Evaluation Phase:**

At later stage that is in 1978, BAUM has added an additional stage called Evaluation which usually closes the project life cycle. 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, to judge whether the decisions and actions taken were corrective, to see whether the results obtained are optimal in a sense that the resources are efficiently utilized and whether the project’s goals and objectives are effectively achieved. The extent to which the objectives of a project are being realized provides the primary criterion for an evaluation. The analysts look systematically at the elements of success and failure in the project experience to obtain insights about how to plan more productive projects in future.

 Evaluation is not limited only to completed projects. It is the most important managerial tool in ongoing projects and rather formalized evaluation may take place at several times in the life of project. Evaluation may be undertaken when a project is in trouble, as the first step in a re-planning effort. Careful evaluation of the project should precede any effort to plan follow-up projects. Finally, evaluation should be undertaken when a project is terminated or as well in routine operation. Different people may do evaluation like:

* Project management will be continuously evaluating its experience as implementation proceeds.
* The sponsoring agency, the operating ministry, the planning agency or an external assistance agency may undertake evaluation.
* In large and innovative projects, the project’s administrative structure may provide a separate evaluation until responsible for monitoring the projects implementation and for bringing problems to the attention of the project’s management.

Evaluation can help not only in the management of the project after the initial phase but also in the planning of the future projects.

**B. The UNIDO model:**

The United Nations Industrial Development organization (UNIDO)is the most devoted institution towards the development and the standardization of the concept, context and content(CCC)of industrial project management system. According to the UNIDO approach documented in the UNIDO manual, the project development cycle comprises three distinct phases, they are:

1. Pre- investment phase

2. Investment phase and

3. Operational phase

Each of these three phases is divided into several stages, some of which constitute important consultancy, engineering and industrial activities as shown below:

**1. Pre- investment phase**

* Opportunity study( identification of project ideas)
* Pre-feasibility study (preliminary project formulation , selection of alternatives)
* Feasibility study (techno-economical project back ground, final project formulation stage)
* Evaluation report ( decision making about project availability)

**2. Investment phase**

* Project design stage
* Construction stage
* Pre-production marketing stage
* Training
* Start-up stage

**3. Operational phase**

* Replacement of equipment
* Development, invasion or liquidation

Before dealing with pre –investment phase, the various stages of the investment and operational phases are considered since these impacts on the nature and scope of pre-investment studies. The project investment or implementation phase for a large industrial business project will be different as compared to that of a small non- industrial project.

Assuming that a projected industrial activity involves the construction of a factory and the installation of machinery and equipment, the project investment phase could be divided in to the following stages:

* Project engineering designs
* Negotiations and contracting
* Construction and training and
* Plant start up

An adequate importance should be given to the pre investment phase, because the success or failure of an industrial project ultimately depends upon the marketing, technical, financial and economic feasibility study findings and their interpretation. To reduce wastage of scarce resources, a clear comprehension of the sequence of events is required when developing an investment proposal from the conceptual stage by way of active promotional efforts to the operational stage.

1. **Pre-investment stage**

It is a usual practice, project ideas must be elaborated in a more detailed study. However, formulation of the detail techno-economic feasibility study, that enables a definite decision to be made on the project, is a costly and time consuming task. Therefore, before assigning large funds for such a study, a preliminary assessment of the project idea must be made in a pre-feasibility study. This is just seeing that whether:

* All possible project alternatives are examined
* The project concept justifies the detail study
* All aspects are critical and need in-depth investigation
* The project idea is viable and attractive or not

According to the UNIDO manual, the main stages of the pre-investment phase are as follows:

* Identification of investment opportunities (opportunity studies)
* Analysis of project alternatives and preliminary project selection
* Project preparation( pre-feasibility and feasibility studies ) and
* Project appraisal and investment decision (appraisal report)

These stages assist a potential investor in the decision making process and provide the base for project decision and implementation.

**a. opportunities studies**

Identification of investment opportunities is the starting point in a series of investment related activities when potential investors (private or public) are interested in obtaining information on newly identified viable investment opportunities. The main instrument used to quantify the parameters, information and data required to develop a project idea into a proposal is the opportunity study. An opportunity study should identify investment opportunities or project ideas by analyzing the following factors in detail:

* Natural resources with high potential for processing and manufacture:
* Existing agricultural pattern that serves as a basis for agro-based industries:
* The future demand for certain consumer goods or for newly developed goods:
* Imports in order to identify areas for import substitution:
* Cost and availability of production factors:
* Possible expansion of existing industrial capacity to attain economies of scale and
* Export possibilities.

**b. Pre-feasibility studies**

A Pre-feasibility study should be viewed as an intermediate stage between a project opportunity study and a detailed feasibility study. c and the intensity with which project alternatives are examined. The structure of a prefeasibility study should be the same as that of the detailed feasibility study. These two studies basically compile the information on the justification of the project. In a practical sense, the main components of the project feasibility report are:

* Executive summary
* Project back ground and history
* Market and plant capacity
* Location and site
* Project engineering works
* Factory, administrative and sale overheads
* Man power
* Project implementation
* Financial analysis and
* Project risk analysis

**C. feasibility studies**

A feasibility study should provide all data necessary for making the investment decision.

The commercial, technical, financial, economic and environment prerequisites for an investment project should therefore be defined and critically examined on the basis of alternative solutions already reviewed in the pre-feasibility study. The results of these efforts strengthen a project whose back ground conditions and aims have been clearly defined, in terms of its control objective and possible marketing strategies, the possible market share that can be achieved, the corresponding production capacities, the plant location existing raw materials, appropriate technology and mechanicalequipment and, location, existing raw materials, appropriate technology and mechanical equipment and if required an environmental impact assessment.

The financial part of the study covers the scope of the investment, including the net working capital, the production and marketing costs, sales revenue and the return on capital invested. The final estimates on investment and production costs and its subsequent calculations of financial and economic profitability are only meaningful if the scope of the project is defined in order not to omit any essential part and its related cost. However, there is no uniform approach or pattern to cover all industrial projects of whatever type, size or category. The emphasis on the components varies from project to project. For most industrial projects, however, there is a broad format of general application-bearing in mind the larger the project the more complex will be the information required.

**d. Appraisal Report**

When a feasibility study is completed, the various parties will carry out their own appraisal of the investment project in accordance with their individual objectives and evaluation of expected risks, costs and gain. Large investment and development finance institutions usually have formalized project appraisal procedures and usually prepare an appraisal report. This is the reason why project appraisal should be considered an independent stage of the pre-investment phase, marked by the final investment and financing decisions taken by the project promoters.

The appraisal report will prove whether the pre production expenditures spent since the initiation of the project idea were well spent or not. Project appraisal, as carried out by financial institutions concentrates on the health of the company to be financed, the returns to be obtained by equity holders and the protection of its creditors. The techniques applied to appraise projects in line with these criteria center around technical, commercial, market, managerial, organizational, financial and if possible economic aspects of project.

1. **Investment (implementation) phase**

The investment or implementation phase of a project provides a wide scope for consultancy and engineering work, first and foremost, in the field of project management. The investment phase can be divided into the following stages:

* Technological acquisition and transfer
* Detailed engineering design and contract, including tendering, evaluation of bids and negotiations
* Acquisition of land, construction work and installation
* Pre-production marketing, including the securing of suppliers and setting up the administration of the firm
* Recruitment and training of personnel and
* Plant commissioning and start-up

Detailed engineering design comprises preparatory work for site preparation, the final selection of construction planning and time scheduling of factory construction, as well as the preparation of flow charts, scale drawing and a wide variety of layouts. During the stage of tendering and evaluation of bids, it is chiefly important to receive comprehensive tenders for goods and services for the project from a sufficiently large number of national and international supplies of proven efficiency and with good delivery capacity.

This stage covers the signing of contracts between the investor on the one hand, and the financing institutions, consultants, architects and supplies of raw materials and required inputs on the other.

The construction stage involves site preparation, construction of buildings and other civil works, together with the erection and installation of equipment in accordance with proper programming and scheduling. The personnel recruitment and training stage, which should proceed simultaneously with the construction stage, may prove very crucial for the expected growth of productivity and efficiency in plant operations. Plant commissioning and start up is usually a brief, but technically critical span in project implementation.

1. **Operational Phase**

The problem of the operational phase needs to be considered from both short and long term view points. The short term view relates to the initial or commencement of production when a number of problems may arise concerning such matters as the application of production techniques, operation of equipment or inadequate labor productivity owing to lack of qualified staff and labor. Most of the problems have their origin in the implementation phase. The long term view relates to chosen strategies and the associated production and marketing costs as well as sales revenues. These have a direct relationship with the productions made at the pre-investment phase. If such strategies and projections prove faulty and remedial measures will not only be difficult, but may prove highly expensive.

1. **The DEPSA Model**

In Ethiopia, **Development Project Studies Authority (DEPSA)** made certain efforts and developed a model for Project life cycle which is known as DEPSA’s Project life cycle. This life cycle comprises three major phases. They are:

1. **Pre-investment phase**
2. **Investment and**
3. **Operation**

Each of these three phases may be divided into different stages.

The following is the summary of this classification of the project life cycle.

**1. Pre- investment Phase**

 **a. Identification Stage**

 **b. Formulation Stage**

* Pre-feasibility study
* Feasibility study

 **c. Appraisal**

* Appraisal
* Decision

**2. Investment Phase**

* **Implementation**
* Tendering negotiation and contractual
* Detailed engineering design
* Construction, erection and commissioning

 **3. Operation Phase**

* Operation
* Ex-post evaluation
1. **Pre-investment phase**
2. **Project Identification**

Projects identification amounts to finding projects, which could contribute toward achieving, specified development objectives. Or the first stage in project cycle is to identify an idea, which enables to launch a project. The question at this stage is where do project ideas come from?

### Sources of project ideas

We can distinguish two level where projects ideas are born: the macro level and the micro level.

At the macro level project idea comes from:

* National, sectoral or regional plans and strategies supplemented by special studies often called opportunity studies, conducted with the explicit aim of translating national and sectoral programmes into specific projects.
* Constraints in the development process due to shortage of essential infrastructure facilities, problems in the balance of payments, etc
* A government's decision to correct social and regional inequalities or to satisfy basic needs of the people through development projects.
* Unusual events such as drought, floods, earthquake, etc
* A possible external threat that necessitate projects aiming at achieving, for example, self sufficiency in basic materials, energy, transportation etc.
* Multi or bilateral agreement

At the micro level, project idea emanate from:

* The identification of unsatisfied demand or need
* The existence of unused or underutilized natural or human resources and the perception of opportunities for their efficient use
* The initiative of private or public enterprise in response to incentives provided by the government
* The necessity to complement or expand investment previously undertaken: and
* The desire of local groups or organization to enhance their economic independence and improve their welfare.

Once to some project ideas have been put forward, the first step is to select one or more of them as potentially viable. This calls for a quick preliminary screening by experienced professional who could also modify some of the proposal. Following the preliminary screening, promising project options should be investigated in a systematic manner. This requires the preparation of brief reports that clearly indicates in sufficient and details those project versions that are promising and suggests those projects options that should be eliminated. Reports of this type are often called pre-feasibility or pre investment studies**.**

1. **Project Formulation**

**I. Content of the pre-feasibility study**

The pre-feasibility study should briefly discuss

* The objectives of the project
* The nature and size of the demands 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
* Basic alternative technologies available and their merits and weakness
* Approximate investments and operation costs as hell as expected revenue
* Rough estimate of financial and economic return
* Any major factors that is likely to have an important effect on the project

 **II. Feasibility study**

If the pre-feasibility study indicates that the project is, prima facie, promising and further work is justified, the project enter the stage of preparation. The project is now being seriously considered as a definite investment action and detailed planning of the idea can begin project preparation (sometimes called project formulation) covers the establishment of technical, economical and financial feasibility. Decisions have to be made on the scope of the project, location, and site etc. Complete technical specifications of distinct proposals accompanied by full details of financial and economic costs and benefits are the outcomes of the project preparation stage. The project now exists as set tangible proposals.

**III. Project Appraisal**

Project appraisal can be defined as second look at a project report by a person or an institution that is in no way involved in its preparation. It helps in taking an entirely independent view of the project. Appraisal is the comprehensive and systematic assessment of all aspects of the proposed projects.

Appraisal highlights wide area in the project with the ultimate objective of strengthening them adequately so as to ensure final success of the project. The main objective of the appraisal is to improve and renovate the project with the cooperation of the promoter (financing agencies). It's in this stage that the bank will judge whether the project is acceptable or unacceptable.

Appraisals should cover at least seven aspects of a project, each of which must have been given special consideration during the project preparation phase:

1. Technical: does the proposed project work in the way suggested?
2. Financial: have the financial requirement of the project been properly calculated, their sources identified and reasonable plans made for their repayment? Where this is necessary?
3. Commercial: how will the necessary inputs for the project be supplied and are the arrangements for the disposal of the product satisfactory?
4. Incentives: does things go as they are planned?
5. Economic: does the proposed project consistent from the view point of national development?
6. Managerial: does their exist capable manager to run the planned project successfully and are they given sufficient power and scope to do what is required?
7. Organizational: is the project organized internally and externally into units, etc so as to allow the proposals to be carried out properly, and to allow for change as the project develops?

Frequently these questions are the subjects of a specialized appraised report. On the basis of this report, final decisions are made about whether to go ahead with the project or not. Following appraisal, some projects may be discarded.

 **2. Investment phase**

 **Project Implementation**

In this stage, funds are actually disbursed to get the project set up and running. Translating project plan into actual investment and operation is one of the most critical and difficult task. No matter how sophisticated or detail the project preparation work, it has no value unless it is transformed into action or implemented.

Implementation can be defined as a project stage which 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's where the earlier preparations and designs, plans and analysis are tested in the highlight of reality. The project's objectives are realized only when it is successfully implemented.

Implementation stages begins immediately after the final decision on the project and ends when it starts rendering the benefit envisaged. While in earlier stages of project planning there was more thinking and less action, in this stage more actions and less thinking is needed.

Project implementation, even though it may involve complex decisions, is essentially a logical and systematic approach. Now a days planning the implementation stage of a project explicitly is one of the activity in project preparation. The better and more realistic a project implementation plan is, the more likely it is that the plan can be carried out effectively and the expected output or benefit realized.

Project analysts generally divide the implementation phase into three different time periods. These are:

1. *The investment period:* when the major project investments are undertaken.
2. *The development period:* when the project's production builds up.
3. *The life of a project:* when full development is reached.

 **3. Project Evaluation and operational phase**

Once a project has been carried out, it is often useful (but not always done) to look back over what took place, to compare actual progress with the plans, and to judge whether the decisions and actions taken were reasonable and useful. This we call evaluation.

Evaluation can be defined as a systematic and periodical gathering, analyzing and interpreting of inputs, information to see the effects and impacts of a development programme/project in order it may be adjusted where necessary.

This kind of analysis can help not only in the management of the project after the initial construction phase, but will also help in the planning of future project. Experience with one project can give rise to new ideas for extension of the project. Generally evaluation of a project helps to determine whether the objectives sets were realistic, given the capacities with which and the circumstances in which they had to be fulfilled, to assess the impact of the project activities.