AMBO UNIVERSITY
WOLISO CAMPUS

AGRICULTURAL PROJECT PLANNING AND ANALYSIS (AGEC 3124)

LECTURE NOTE

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Chapter I-

Introduction

Project concept

- Project planning and analysis has a long history in financial and business analysis.
- Project planning has always been used as a means of checking the profitability of a particular investment by private firms.
- Recent experiences show that project analysis has attracted the attention of development economists.
- Projects are now assessed from the economy's viewpoint instead of only from the firm's perspective.
- The selection criteria have also included economic criteria on top of financial criteria.

What is a Project?

- A Project can be defined as an investment activity in which financial resources are expended to create capital assets that produce benefits over an extended period of time.
- The simplest way to understand a project is to identify the following common characteristics:
  - it has a specific starting and finishing time,
  - it has usually geographical and sometimes organizational boundary,
  - it has clearly defined set of objectives,
  - it entails the investment of scarce resources in the expectation of future benefit, and
  - it may be planned, financed and implemented as a unit

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- The basic characteristics of capital expenditure (also referred to as a capital investment or capital project or just project), is that it typically involve current outlay (or current and future outlays) of funds in the expectation of a stream of benefits extending far into the future.

- Capital investment decisions often represent the most important decisions taken by the firm or other decision maker. Capital investment decisions have far reaching impact into the future. They are also characterized by irreversibility. Thus, a wrong capital investment decision often cannot be reversed without incurring substantial loss. They also involve substantial outlay of capital.

Terminology of project word

- P: Problem
- R: Rhythm
- O: Objectivity
- J: Justified
- E: Effort
- C: Creativity and
- T: Time bound

The linkage between projects and programs

- It is necessary to distinguish between projects and programs because there is sometimes a tendency to use them interchangeably.
- While a project refers to an investment activity where resources are used to create capital assets, which produce benefits over time and has a beginning and an end with specific objectives, a program is an ongoing development effort or plan which may not necessarily be time bounded.
- Examples could be a road development program, a health improvement program, a nutritional improvement program, a rural electrification program, etc.

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- A development plan is a general statement of economic policy. National development plans are further disaggregated into a set of sectoral plans.
- A development plan or a program is therefore a wider concept than a project. It may include one or several projects at various times whose specific objectives are linked to the achievement of higher level of common objectives.
- For instance, a health program may include a water project as well as a construction of health centers both aimed at improving the health of a given community, which previously lacked easy access to these essential facilities.

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- Projects, which are not linked with others to form a program, are sometimes referred to as "stand alone" projects.
- Projects in such context are the concrete manifestations of the development plans in a specific place and time.
- One can think of projects as subunits and bricks of programs, which constitute the national plan (usually the direction is from plans to projects).
- We have to note that projects could be either public or private. It is the smallest operational element prepared and implemented as a separate entity in a national plan or program.

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- From the above discussion it can be seen that the major difference between a project and a program is not so much in objectives stated but lies more in scope, the details and accuracy.

- A project is designed with a high degree of precision and details as regards its objectives, features, calculation of returns and implementation plan.

- A program by contrast is general, lacks details and precision and aims at a broader goal often related to a sectoral policy of a country or departmental policy of an organization.

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- Perhaps the distinction between projects and programs would be clear if we see the basic characteristics of projects. Projects in general need to be **SMART**.

S – Specific

- A project needs to be specific in its objective. A project is designed to meet a specific objective as opposed to a program, which is broad.

- A project has also specific activities. Projects have well defined sequence of investment and production activities and a specific group of benefits. A project is also designed to benefit a specific group of people.

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M - Measurable

- Projects are designed in such a way that investment and production activities and benefits expected should be identified and if possible be valued (expressed in monetary terms) in financial, economic and if possible social terms.
- Though it is sometimes difficult to value especially secondary costs and benefits of a project, attempt should be made to measure them.
- Measure costs and benefits must lend themselves for valuation and general projects are thought to be measurable.

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A – Area bounded

- As projects have specific and identifiable group of beneficiaries, so also have to have boundaries.
- In designing a project, its area of operation must clearly be identified and delineated.
- Though some secondary costs and benefits may go beyond the boundary, its major area of operation must be identified.
- Hence projects are said to be area bounded.

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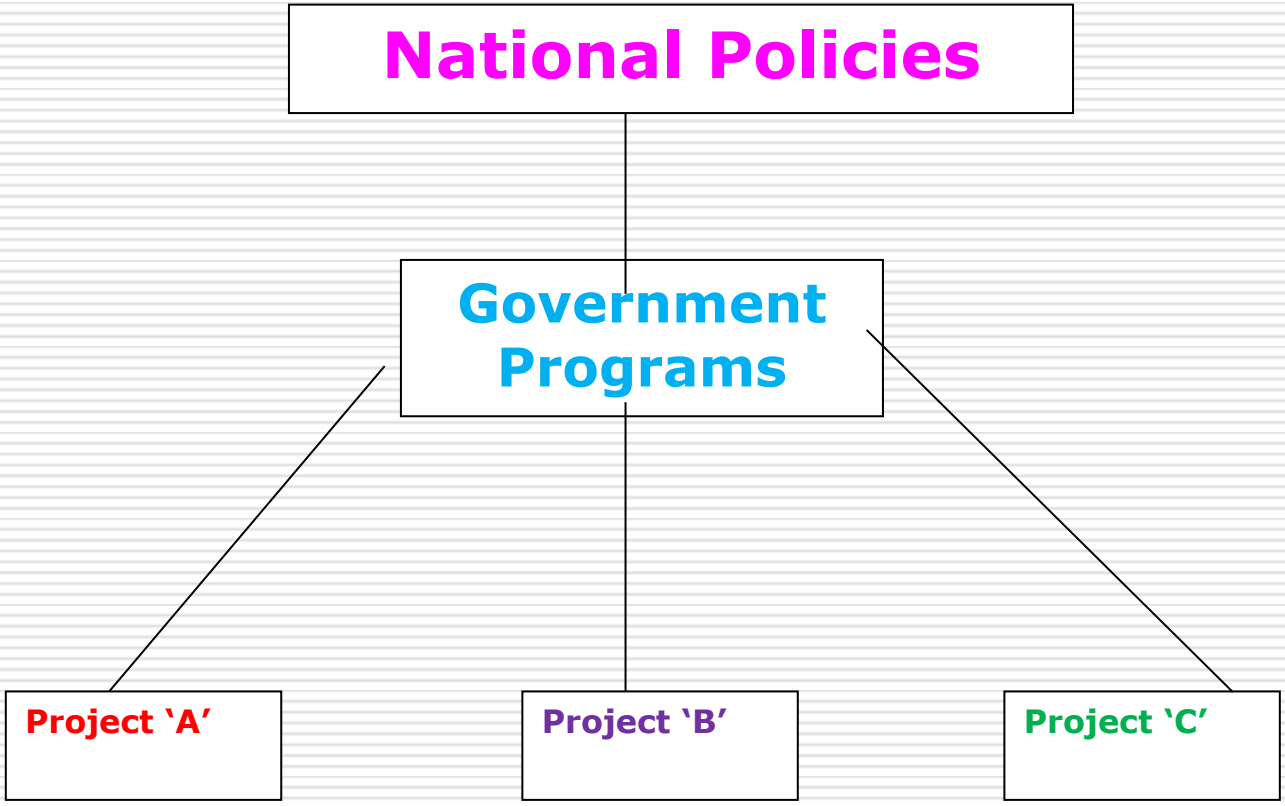
R – Real

- Planning of a project and its analysis must be made based on real information. Planner must make sure whether the project fits with real social, economic political, technical, etc situations. This requires detail analysis of different aspects of a project.

T – Time bounded

- A project has a clear starting and ending point. The overall life of the project must be determined. Moreover, investment and production activities have their own time sequence. Every cost and benefit streams must be identified, quantified and valued and be presented year-by-year.

Relationship among Projects, Program & Policies



What is Rural Project Management?

- Rural Project Management is mainly concerned with development projects which aim at providing basic services to common people.

- Therefore, a development manager's primary objective is to bring benefits to people such as improving livelihood, health status, and educations status.

- **Why Rural Project Management?**
  - Save time
  - Save money
  - Optimize the resources
  - Serve customer needs

Chapter 2

Criteria and approaches for project development

Introduction

- Project planning represents processes during the identification and preparation stages of the project cycle whereby the broad context in which a project will operate is clarified; where particular problem areas are identified and clear objectives are set to achieve the required changes; where alternatives are developed and choices are made; and where appropriate actions are prepared for implementation.

- Project planning also provides the framework for project management, implementation, monitoring and evaluation. To participate in and manage the planning process it is important to learn to work with uncertainty, subjective perceptions and values, and flexibility, openness and communication. Participation is a key to successful project planning. The Logical Framework Approach is very useful in effective participative project planning.

1. What is Logical Framework Analysis (LFA)?

- The log frame model was developed in the United States.
- A log frame (also known as a Project Framework) is a tool for planning and managing development projects.
- Logical Framework Analysis (LFA) is a way of describing a project in a logical way. Earlier it was called "Objective – Oriented Intervention Planning" (OOIP). Now, it is referred to 'Logical Framework Analysis'.
- A logical framework is also known as 'Project Framework'. It is widely being used by the funding agencies including Department For International Development (DFID).

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- The LFA approach is a tool for planning, monitoring and evaluating projects. This is also a useful approach to link projects (at the micro level) to the broader context of regional development programs and national goals (ie. the macro level).
- LFA is essentially used as a tool to clarify cause-effect relationships and to clarify the logical link between project inputs and objectives; project activities and outputs; broader purposes; and the ultimate goals a project could serve. LFA is therefore a systematic planning process based on logical deductions. Experience and knowledge is important to apply LFA.
- Several organisations were involved in developing a scientific, standardised planning methodology such as; the EU, the World Bank, ADB and many donor governments

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- It aims to present information about the key components of a project in a clear, concise, logical and systematic way.

- DFID describes the Logical Framework as "a tool to help designers of projects think logically about what the project is trying to achieve **(the purpose),** what things the project needs to do to bring that about **(the outputs)** and what needs to be done to produce these outputs **(the activities)**.

- The purpose of the project from the DFID viewpoint is to serve our higher level objectives **(the goal)"**.

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- A log frame summarizes all the details of the project in a standard format:
  - What the project is going to achieve?
  - What activities will be carried out to achieve its outputs and purpose?
  - What resources (inputs) are required?
  - What are the potential problems which could affect the success of the project?
  - How the progress and ultimate success of the project will be measured and verified?

What do I need to make a logical framework?

- Supply of large sheets of paper, (preferably flip chart sheets).
- Pencil, eraser and 'Post-it' notes or cards, so you can adjust and amend as you go along.
- Somewhere to work without distractions.
- Ideally, someone to discuss and 'bounce' ideas around with.
- As much information about the planned project as possible - preferably do it 'on site'.

The LFA Process

- LFA is simply a planning tool that provides a structure for specifying the components of an activity or activities, and the logical linkages between a set of means and a set of ends.

- It places a project in its larger framework of objectives. It serves as a useful tool for defining inputs, time tables, assumptions for success, outputs and measurable indicators or "milestones" for monitoring and evaluating performance. It is a highly effective planning tool.

The project context

- Before beginning work on problem or opportunity identification, it must be clarified why we – individually or as a group – are going into the planning process, and what the task is. It is therefore important to clarify the context of the project by answering the following type of questions:

  - How can agricultural production be improved?
  - How can farm incomes be stabilised?
  - How can added value be generated?
  - Who are the major stakeholders and beneficiaries?
  - Who will benefit from the project and who will loose out?

The analytical phase

- Analysis enables us to collect and profile the data needed to plan the intervention.
- A range of different groups (we) are involved in development issues, such as: the target group or groups, the national government, the regional authorities, the sponsor, the experts carrying out the surveys, the institution responsible for implementing the intervention, and so on.
- Each of these parties has its own angle on the situation or has some special contribution to make and they will all seek to put their point of view.
- The problems are written out on charts, which are then displayed. A check is made to see that all have understood them; if not, they are re-formulated.

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- The charts (which include negative states perceived as problems) are displayed in such a way as to highlight the cause-and-effect linkages between the different problems; this exercise will result in a "problem tree"

- Developing the Problem Tree
  - Problems
  - Causes
  - Effect

- By changing the negative states into positive states and by arranging these in groups reflecting the activities-ends linkages, the problem tree turns into an "objective tree"

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- Developing the Objective Tree
  - Objective
  - Activities
  - Ends

- If the participants accept that the activities-ends linkages are correct and complete, they will then, using the criteria at hand, carry out a "strategy analysis" and select the objectives which will constitute the bounds of the planned intervention.

- Strategy analysis

The planning phase: Completing the logframe matrix

Describing the matrix

- When we have analysed the situation, our next step is to plan the intervention. The **planning phase** aims at setting up a logical framework (logframe), in the form of a summary matrix showing four vertical columns and four horizontal ones:
- vertical columns
  - **Column one** shows the (project) **INTERVENTION LOGIC (IL)** which follows from the objectives tree. It is a narrative summarising:
    - **The goal:** The future state at a high level, to which several interventions will contribute.
    - **The purpose (or objective):** The future state targeted by the project intervention itself.

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- **The intermediate results (or outputs):** The future intermediate states or outputs to be brought about **by the intervention** and which together aim at achieving the purpose. The (project) intervention leader is responsible for achieving intermediate results.
- **The activities: The work** which must be carried out as part of the intervention in order to achieve the intermediate result. The intervention leader is responsible for carrying out and managing these activities.

- **Column two** shows the **OBJECTIVELY VERIFIABLE INDICATORS (OVI)**. These describe the goal, the purpose and the intermediate results in operational terms, **ie. in terms of quality, quantity, place** and **time.** An indicator describe **"milestones"** of progress and enables detailed follow-up and monitoring.
- This column shows the **RESOURCES** needed to carry out the planned activities.

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- **Column three** shows the **SOURCES OF VERIFICATION**. These indicate where and in what form information may be obtained in order to verify progress towards achieving the goal, the purpose and the intermediate results.
- This column also includes the **COST** of the resources needed to carry out the activities.
- **Column four** shows **ASSUMPTIONS**: External factors over which the intervention has no direct control but which are nevertheless important with a view of achieving the intermediate results, the purpose and the goal.

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The logframe matrix summarises the intervention in one (full) page as follows:

- **WHAT IS THE GOAL** of the (project) intervention being carried out?
- **WHAT IS THE PURPOSE** of the (project) intervention?
- **HOW** does the intervention contribute to this objective (intermediate results)?
- **WHAT WILL** the intervention **DO** (activities)?
- **WHICH** crucially important external factors will determine the success, or failure, of the intervention (assumptions)?
- **WHERE** can we find the data needed to administer, monitor and evaluate the intervention (sources of verification)?
- **WHAT** resources – and their cost – are involved in the intervention?

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Description of the intervention logic

- The intervention logic comprises all stages contained within the (project) intervention, which need to be completed in order to achieve the goal:
  - intermediate results are achieved through the activities,
  - the purpose is realised through the intermediate results,
  - the goal is reached via the purpose.

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LOGFRAME

Intervention Logic		Objectively verifiable indicators	Sources of verification	Assumptions
Goal				
Purpose				
Intermediate Results (outputs)				
Activities & inputs		**Resources**	**Cost**	

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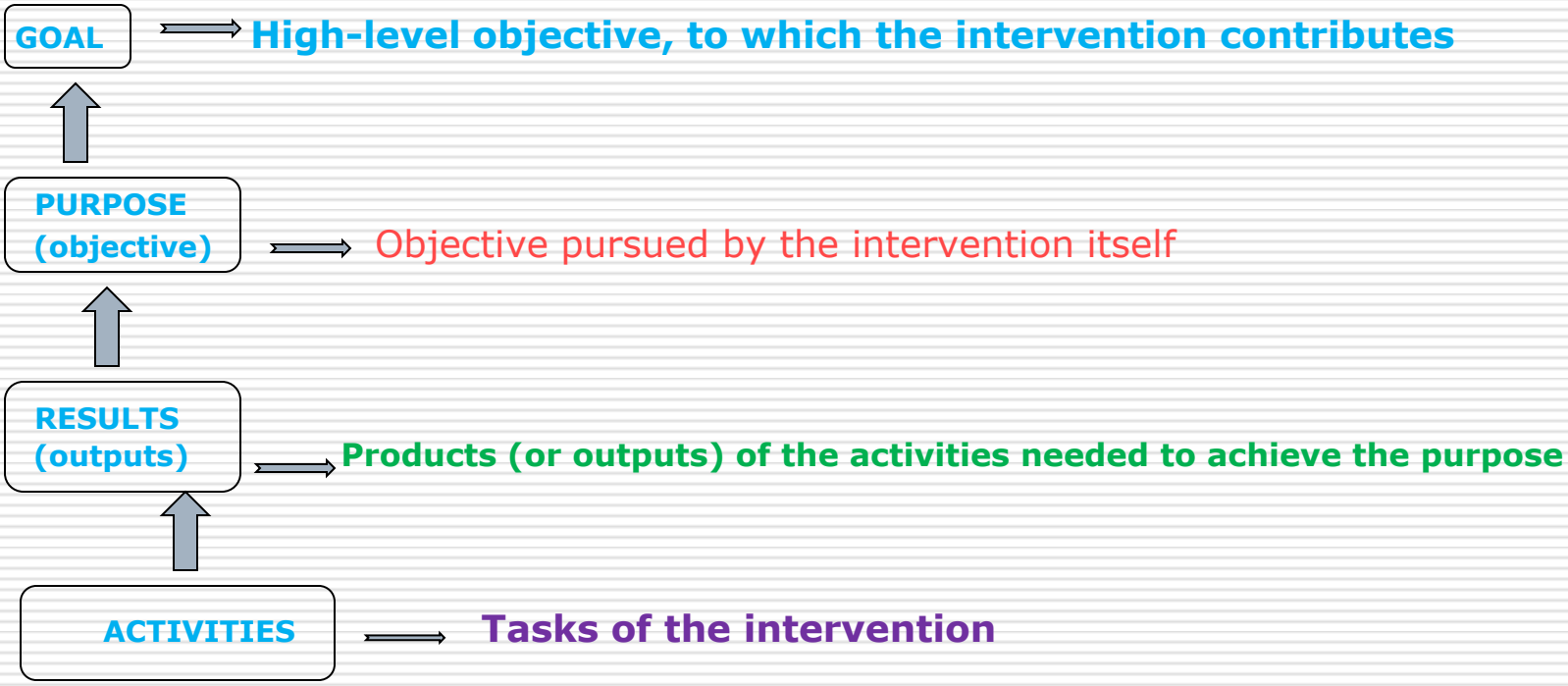
- The following sequence is adhered to:



Objectively Verifiable Indicators (OVI):

- OVI are measures designed to admit of (objective study) the goal, the purpose and the intermediate results.

- The key to the log frame in terms of effectiveness is the clear identification of indicators.

- Here an attempt is made to translate the general objectives, and attach one or more indicators to each specific objective, thus, transforming the general objectives of the project into measurable performance targets.

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- Indicators are formulated to measure the achievements of the objectives for each output. Indicators are performance standards, and set the targets for a project.

- The indicators describe each objective precisely in terms of :
  - The quality to be reached;
  - The quantity which is set as target;
  - The target group which is affected by an objective or that benefits from these objectives;
  - The time at which the objective is supposed to be achieved; and
  - The location or region where the objective is supposed to be realised.

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Example 1: For the purpose: **"Rice production increased"**

- Target group : The farmer (owning at least 0.5 hectares)
- Quantify : 10 000 farmers increase their output by 50%
- Qualify : **10 000 farmers increase rice production whilst maintaining 2007 crop quality**
- Time : Before 2009
- Place : The district of Girar jarso

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Example 2: For the purpose: "Quality of hospital services improved"

- Target group : Road casualties
- Quantify : 500 casualties
- Qualify : **The death rate among casualties falls from 25% to 12.5%**
- Time : 2008
- Place : Fitche Hospital

Sources of verification

- Sources of verification are the results of surveys and/or findings which give us the data we need to use the OVI.
- What should we look out for when describing the sources of verification?. It is wise to specify:
  - Access: Where and when can we find the data?
  - Who is responsible for the data?
- Why do we describe the sources of verification?
  - To find out what the intervention should do to obtain the data and at what cost.
- The sources of verification must supply infallible, reliable and accessible data.

Resources (inputs)

- **Resources comprise** the (human and physical) input thanks to which the intervention will be able to carry out its activities. kind of resources may be;
  - **Human resources**: National staff, expatriate development worker and scholarship students.
  - **Investment (or production) resources**: There are assets which cover several production cycles and for which a depreciation allowance must be made.
  - **Operating resources** are resources which can be used only once, since they are destroyed (ie. seed) or transformed (ie. raw materials, fuel, incidental expenses) in the process
- **There are three possible sources of resource:**
  - **The donor**
  - **The developing country institutions**
  - **The intervention itself**

The Advantages of LFA as a Planning Tool

- It tries to make the project appraisal transparent by explicitly stating the assumptions underlying the analysis, and by allowing a check on the proposed hypotheses and expected results in an ex-post analysis;

- It deals explicitly with a multitude of social goals and does not require the reduction of the benefits into one figure;

- It is understandable to non-scientists. The logframe, therefore, can be used as a tool to clarify trade-offs, and thus, to ameliorate the decision-making process; and

- It is flexible with regard to information and skill requirements. It can incorporate social benefit – cost analysis, use input-output tables, and partial models. But it can also be used with rudimentary information skills, albeit of the cost of more hypothesis and uncertainties.

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Thus, **a log frame** enables planners to:

- Set clear objectives.
- Define indicators of success:
- Performance standards.
- Incorporate change over time.
- Clarify logical linkages in the plan.
- Define critical assumptions underlying the project.
- Identify key activity groups.
- Identify means of verifying project accomplishments.
- Define resources required for implementation.
- Set up a need-based monitoring and evaluation system

2. SWOT analysis

- Strengths, Weaknesses, Opportunities, Threats. These aspects of a business are examined to assess its past and present performance and prospects.

Example:

- A SWOT analyses for establishing a dairy farm is given below.

Strengths

- Livestock products i.e. Milk & Meat are major source of food.
- Dairy sector is having enormous potential for sizeable earnings
- North Shawa is having wide scope of Milk Production, ranking 2rd at Oromia region level
- Dairy sector in Ethiopia is having low cost of production compare to competitive milk producing countries
- Ample human resource and manpower availability in dairy farming
- Ethiopian culture is having long tradition of cattle and livestock rearing
- Large base of cattle for milk production

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Weaknesses

- Relatively small dairy cattle milk production market
- Chronic lack of improved, adapted dairy cows
- Unorganized sector, unaware of basic farm management practices including record keeping, farm/ market infrastructures & marketing information
- Nutrition is still a problem hampering the livestock productivity in general and milk production in particular
- Enormous production losses due to endemic diseases every year
- Poorly developed cold chain with inadequate number of milk chilling and processing centers
- Lack of education, technical skills, initiative and experience in modern dairy farming
- Adoption of traditional approach
- Post harvest milk losses are very high estimated at 40 kg per capita per year
- Obsolete equipment and technologies

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Opportunities

- Increasing demand of value added dairy products
- Local and global dairy products needs are much higher than supply
- Govt. of Ethiopia & State Bank of Oromia priority sector
- Commercially viable sector with great credit potential and absorption capacity
- Cooperatives can play a big role for development of dairy sector in Ethiopia
- Dairy sector provides raw material for food & leather industry

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Threats

- High risks of diseases in livestock
- Defective and unorganized markets
- Imbalance between prices of inputs & outputs
- Rising trend of cost of production with higher rate of interest as compared to profit ratio
- Lack of media projection, non-recognition of problems and monopoly of multinationals
- Lack of community organizations and out dated farm practices
- Lack of coordination towards common causes & goals
- Lack of awareness about economics, demand & supply in market
- Low saving, low holding capacity
- Non-availability of subsidy, tax holidays

Chapter 3

Project costs and Benefits

Identifying project costs and benefits

- We undertake economic analysis of projects to compare costs with benefits and determine which among alternatives project have an acceptable economic return and we do the same for financial analysis.

- The costs and benefits of a project therefore must be identified. Further more, once costs and benefits are known they must be priced and their economic value determined.

3.1Objectives, Costs and Benefits

- In identifying costs and benefits of a project, objectives play important role.
- In project analysis, the *objectives* of the project provide the standard against which cost and benefits are defined.
- Simply put, a cost is anything that reduces an objective, and a benefit is anything that contributes to an objective. The problem with such simplicity, however, is that each participant in the project has many objectives.

1. For a farmer

- A major objective of participating in a project is to maximise the amount his/her family has to live on.
- A farmer may have an objective to avoid risk and so may plan his cropping pattern to limit the risk of crop failure to an acceptable level or to reduce the risk of depending solely on the market for the food grains the family will consume.
- All these considerations affect a farmer's choice of cropping pattern and thus the income-generating capacity of the project.

2. private business firm

For example - A private business firm can have objectives such as:

- Maximizing net income (profit)
- Increasing market share
- Improving customer satisfaction
- Reducing risk, etc.

3. society or a nation as a whole

- A society or a nation as a whole may want to achieve the following objectives as:
  - Increasing national income (growth objective)
  - Ensuring equitable distribution between persons, regions, generations, etc. (distributional objective)
  - Improving balance of payments
  - Improving regional integrity
  - Reducing inflation
  - Reducing unemployment
  - Maintaining environment

Cont'd…

- However, the problem with such a number of objectives is, there is no formal analytical system for project analysis that could possibly take into account all the various objectives of the society or private business firm.

- Thus, we will take maximization of net incremental income (profit) for a private firm and maximization of national income for a nation as the *fundamental objectives* in the analysis of a project.

3.2 Costs & Benefits in Financial and Economic Analysis

- The projected financial revenues and expenses are often a good starting point for identifying economic benefits and costs but two types of adjustments are necessary.
- First it is necessary to include (or exclude) some costs and benefits.
- Second it is necessary to revalue inputs and outputs at their opportunity cost.

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- The important difference between financial and economic analysis is in the price that the project entity uses to value the inputs and outputs.

- Financial analysis is simply based on the actual prices that the project entity pays for inputs and receives for outputs. The prices used for economic analysis, however, are based on the opportunity costs to the country.

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❖The economic values of both inputs and outputs usually differ from their financial value (market prices) because:

- There are different market imperfections;
- There are government interventions of various kinds (taxes, subsidies, tariff, price control, etc, and;
- Some goods are public goods by their nature (may not totally have market (price) or the price consumers are willing to pay are less).

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- The divergence between financial and economic prices and flows show;
  - The extent to which some one in society, other than the project entity, enjoys a benefit or pays a cost of the project. And hence enable the analyst to identify 'gainers' and 'losers'.

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- The magnitudes and incidence of transfers are important pieces of information that;
  - shed light on the project's fiscal impact, other distribution of costs and benefits and hence on its likely opponents and supporters.
  - By identifying the groups that benefits from the project and groups that pay for its costs, the analyst can extract valuable information about the incentives that these groups have to see to it that the project implemented as designed.

3.3 Categories of Costs and Benefits

A. Direct transfer payments

❖ Common transfer payments in projects are:

- **Taxes**: Payment of taxes is clearly cost in financial analysis.
- **Subsidies :**are simply direct transfer payment that flow in the opposite direction from taxes.
- **loans, and debt services**

B. Costs of inputs

- **Physical goods**
- **Labor**
- **Land**

Con't

C. Contingency allowance

- Contingency allowance may be divided into those that provide for physical contingencies and those for price contingencies.
- ***Physical contingency:*** allowance is a real cost & will reduce the final goods and services available for other purposes, i.e. it will reduce the national income and, hence, is a cost to the society.

Con't

- **Price contingency***:* In most practical cases, in project cost estimation is assumed that there will be no relative changes in domestic or international prices and no inflation during the investment period.

D. Sunk costs

- Sunk costs are those costs incurred in the past upon which a proposed new investment will be based.
- When we analyze a proposed investment, we consider only future returns to future costs; expenditure in the past, or sunk costs, do not appear in both financial and economic accounts.

3.4.Tangible benefits of projects

- Increased production
- Quality improvement
- Change in time of sale
- Change in location of sale
- Change in product form (grading & processing)
- Cost reduction (through mechanization)
- Losses avoided

➢ Since all these benefits are real increase in value of commodities or reduction in costs, they will be considered in both analyses.

3.5. Externalities

- **Secondary costs and benefits:** Projects can lead to benefits created or costs incurred outside the project itself. Economic analysis must take account of these external, or secondary, costs and benefits so they can be properly attributed to the project investment.
- **Intangible costs and benefits:** Almost all projects have costs and benefits that are intangible. These costs and benefits will not usually appear in financial accounts and are excluded from financial analysis.

Con’t

- Intangible benefit may include creation of job opportunities, better health and reduced infant mortality, better nutrition, reduced incidence of disease, national integration, national security, etc.
- Likewise in the cost side, a project may displace workers, it may increase disease incidences, it may increase regional income inequality, it may destroy or reduce the scenic beauty of an area, etc.

3.6.With and without project comparison

- Project analysis tries to identify and value the costs and benefits that will arise with the proposed project and compare them with the situation as it would be without project.
- The difference is the incremental net benefit arising from the project investment.
- This approach is not the same as comparing the situation "before" and "after" the project.

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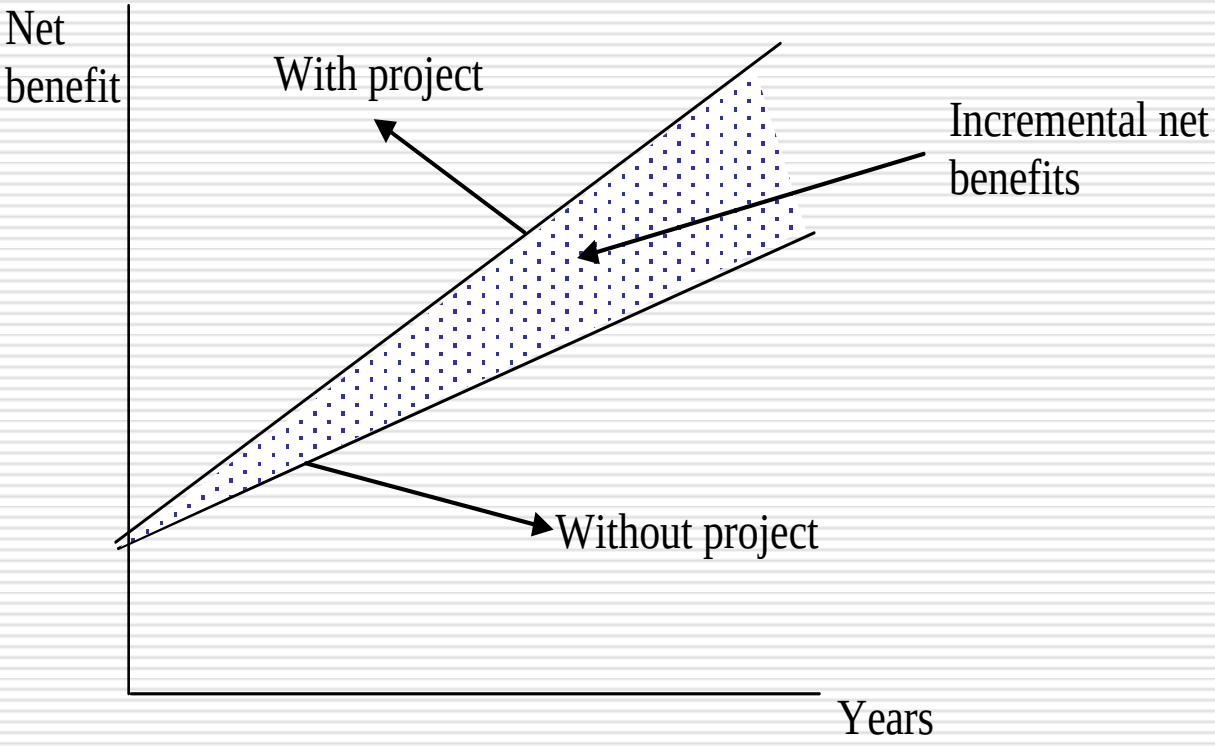

Fig. 1.1: The with/without project comparison

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- The above figure illustrates a change in output can take place if production is already increasing (decreasing) and would continue to increase (decrease) even without project.

- Thus, if production without the project were to increase at 3 percent per year and with the project at 5 percent per year, the project's contribution would be an increase of 2 percent per year.

Chapter 4

Financial cost-benefit Analysis

4.1 Objectives of Financial Analysis

Assessment of financial impact

- The most important objective of financial analysis is to assess the financial effects the project will have on participants (farmer, firms, government, etc).

- This assessment is based on the comparison of each participant's current and future financial status with the project against the projection of his future financial performance as the project is implemented.

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Judgment of efficient resource Use

- For management especially, overall return is important because managers must work within the market price framework they face. Investment analysis & financial ratio analysis provide the tool for this review.

Provision of sound financial plan

- The financial plan provides a basis for determining the amount and timing of investment, debt repayment capacity, and also helps to coordinate financial contributions. Assessment of financial management competence especially for large projects, financial analysis will enable the analyst to judge the complexity of the financial management & the capability of managers so that he can judge what changes in organization and management may be necessary.

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Assessment of Incentives

- The financial analysis is of critical importance in assessing the incentives for different participants of the project.
- Will participants have an incremental income large enough to compensate them for the additional effort and risk they will incur? Will private sector firms earn a sufficient return on their equity investment & borrowed resources to justify making the investment the project requires?
- For semipublic enterprises, will the return be sufficient for the enterprises to maintain a self-financing capability and to meet the financial objectives set out by the society?

4.2 Pricing Project Costs and Benefits

- Once costs and benefits have been identified, if they are to be compared, they must be valued.

4.2.1 Finding Market Prices

- The first step in valuing costs and benefits is finding the market prices for the inputs and outputs.
- The project will have to consult many sources such as merchants, consumers, experts, published statistical bulletins, etc.

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- Point of first sale and farm-gate price
- Predicting Future Prices
- Change in prices
- Change in relative price
- Inflation
- Financial export and import parity price
- Export Parity Price
- import parity price

Point of first sale and farm-gate price

- **Point of first sale** - the location where the first sale transaction takes place for a product. If the point of first sale is in a relatively competitive market, the price may be a good estimate of economic value. By using a price derived from the point of first sale, the analyst avoids using an imputed value.

- Usually the price at point of first sale can be accepted as the farm-gate price; even if this point is in a near by village market, the farmer sells his output there and thus earns for himself any fee that might be involved in transporting the commodity from the farm to the point of first sale.

- A good starting point is the farm-gate price at the peak of the harvest season. This is probably close to the lowest price in the cycle. The reasoning is that the rise in price is due to marketing services.

Predicting Future Prices

- Since project analysis is about judging future returns from future investment, we have to judge what the future prices of inputs and outputs may be.
- The best starting point is to see the trend of these prices over the past few years.
- Having this data, the project analyst can forecast the price with certain degree of precision.
- Moreover, we have to keep in mind that, as projects involve distant future, the prediction power of the model will decline as we go far from the present.

4.2.2 Change in price

- **Change in relative price**
- These changes in relative price of items imply a change in marginal productivity of inputs in production or a change in marginal satisfaction (MU) in consumption.
- Thus, changes in relative prices have a real effect on the project objective and must be reflected in project accounts in the years when such changes are expected. This can be judged from past trend.
- For instance, the price of agricultural products to price of inputs (manufactured) may rise over time. This would have a real effect on the net benefit of the firm.

Inflation

- Inflation is common for every country although the magnitude may vary between countries.
- However, the approach most often taken is to work the project analysis in constant price.
- It is assumed that inflation will affect most prices to the same extent so that prices retain their same general relations.
- It is quit possible, however, to work the whole project analysis in current (not constant) prices.
- The problem with this approach is it involves predicting inflation rates of both domestic and foreign countries that would have substantial impact.

4.2.3 Financial export and import parity price

- As indicated earlier, financial analysis will be made base on market price. The project may use imported inputs and export its output, to foreign markets.
- If there are domestic markets for these inputs and outputs, and if the firm is free to sell or buy at the domestic or world market, we take the domestic price with appropriate adjustment to reflect the price at the project site.
- If, on the other hand, commodities of the project are produced only for foreign market or if the domestic demand cannot absorb the firm's output, we will take export-parity and import parity prices ever in financial analysis.

Export parity price

- One common case for which an export parity price has to be calculated is that of a commodity produced for a foreign market.
- If for example, a project produces flower to export it to Canada or U.S.A., we start with the c.i.f. price at the harbor of importing country.

Export Parity Price

C.i.f. at point of import (say, Canada port)

Deduct- unloading at point of import

Deduct- freight to point of import (in this case air freight)

Deduct – insurance

Cont'd…

Equals – *f.o.b.* at point of export (A.A)

Convert foreign currency to domestic currency at official exchange rate (OER)

Deduct –tariff (export duties)

Add - subsidy

Deduct - local port charges

Deduct - local transport & marketing (if not part of project)

Equals *export parity price* as project boundary

Deduct - local storage, transport & marketing costs (if not part of project cost)

Equal export parity price at project location (farm gate)

Import Parity Price

F.o.b. price at point of export

Add-freight charges to point of import

Add-insurance charges

Add- unloading from ship to pier at port

C.i.f. Price at the harbor of importing countries

Convert foreign currency to domestic one (multiply by OER)

Add-tariffs (import duties)

Deduct-subsidies

Add-local port charges

Add-transport & marketing costs to relevant wholesale market

Equal price at wholesale market

Cont'd…

Deduct-local storage & other marketing costs (if not part of project cost) -this is the marketing margin between central market and the project site.

Equals *import parity price* at project location (Farm/project gate price).

- OER (official exchange rate) is the rate at which one currency (say, Birr) is exchanged for another currency (say, Dollar). It is official because it is the rate established by monetary authorities of a country not by the market mechanism. In financial analysis the OER would always be used.

Cont'd…

- Before calculating the export or import parity price at the project site, we need to forecast the future *c.i.f.* or *f.o.b.* price at the border.
- This may require assessment of the past trend of this border price.
- After we determined the future *c.i.f.* or *f.o.b.* price, we then continue to calculate export parity price.

4.3 Financial Ratios

- From the projected financial statements for an enter prize, the financial analyst is able to calculate financial ratios that allow him to form a judgment about the efficiency of the enterprise, its return on key aggregates and its credit worthiness. These can be;

4.3.1 Efficiency Ratios

Inventory turnover

- This measures the number if times that an enterprise turns over its stock each year and indicates the amount of inventory required to support a given level of sales. It can be computed as;

$$\text{Inventory turnover} = \frac{\text{cost of goods sold}}{\text{the inventory}}$$

cont'd…

- The inventory turnover can also relate to the average length of time a firm keeps its inventory on hand.

- A low ratio may mean that the company with large stocks on hand may find it difficult to sell its product, and this may be an indicator that the management is not able to control its inventory effectively.

- Thus a low ratio, though good, may indicate cash shortage & the firm might sometime be forced to sell by forgoing sales opportunities.

cont'd…

- **Operating ratio**

- This is obtained by dividing the operating expenses by the revenue.

$$\text{Operating ratio} = \frac{\text{Operating expense}}{revenue}$$

Cost of raw material, labor etc

cont'd…

4.3.2 Income ratios

- Financial viability of an enterprise depend on the funds it can generate for reinvestment and growth and on its ability to provide a satisfactory return on investment.

- ***Return on sales***
- This shows how large an operating margin the enterprise has on its sales.

$$\text{Return on sales} = \frac{Net income}{revenue}$$

cont'd…

- **Return on equity**

- It is an amount received by the owner of the equity. It is obtained by dividing the net income after taxes by the equity. Equity - an ownership right or risk interest in an enterprise. Equity capital is the residual amount left after deducting total liabilities (excluding stockholder's claim) from total assets.

$$\text{Return on equity} = \frac{\text{Net income}}{equity}$$

- This ratio is frequently used because it is one of the main criteria by which owners are guided in their investment decisions.

cont'd…

- ***Return on assets***

$$\text{Return on assets} = \frac{\text{Operating income}}{\text{Assets}}$$

- The earning power of the assets of an enterprise is viral to its success. The return on assets is the financial ratio that comes closest to the rate of return on all resources engaged.

- A crude rule of thumb is this value should exceed interest rate.

4.3.3 Creditworthiness Ratios

- The purpose of creditworthiness ratios is to enable a judgment about the degree of financial risk inherent in the enterprise before undertaking a project. It also help to estimate the amount and terms finance needed.

- **Current ratio**

- This is computed by dividing the current assets by the current liabilities. Though it needs caution, as a rule of thumb, a current ratio of 2 is acceptable.

$$Current = \frac{\text{Current asset}}{\text{Current liability}}$$

cont'd…

- **Debt-equity ratio**
- This is an important ratio for credit agencies. It is calculated by dividing long-term liabilities by the sum of long-term liabilities plus equity to obtain the proportion that long-term liabilities are to total debt and equity, and then by dividing equity to obtain the proportion that equity is of the total debt and equity. These are then compared in the form of a ratio.

$$\text{Equity Ratio} = \frac{\text{Equity}}{\text{Equity} + \text{Longterm liability}}$$

$$\text{Liability ratio} = \frac{\textit{Longterm liability}}{\text{Equity} + \text{Long term liability}}$$

cont'd…

$$\text{Debt - Equity Ratio} = \frac{LR}{ER}$$

- It tells us, of the total capital, how much proportion is equity & how much is debt. If for example we have 40 to 60, it means that of the total capital 40% is debt and 60% is equity. In general strong equity base is good for a project to overcome risk & uncertainty. Especially in some risky projects, high ratio is a necessary condition.
- ***Debt service coverage ratio***
- The most comprehensive ratio of creditworthiness is the debt service coverage ratio. This is calculated by dividing net income plus depreciation plus interest paid by interest paid plus repayment of long-term loans.

cont'd…

- Debt service coverage ratio = $\frac{\text{Net income} + \text{Depr.} + \text{Interest}}{\text{Interest} + \text{repayment of loan (p)}}$

- It tells us how a project can absorb only shocks without impairing the firms ability of meeting obligations.

- In contrary to this it can also tell us how the firm chose an appropriate credit term.

CHAPTER: 6
Measures of Project Worth

- When costs and benefits have been identified, quantified and priced (valued), the analyst is trying to determine which among various projects to accept, which to reject.

- There are two methods for measuring the worthiness of projects: undiscounted & discounted methods.

- The arithmetic of these discounted methods, and the way we interpret the measures and their limitations, is exactly the same whether we are using them for financial analysis or for economic analysis.

Cont'd…

- Before embarking on the methods, it is important to note two critical points.
- First, there is no one best technique for estimating project worth; each has its own strength & weakness.
- Second, these financial and economic measures of investment worth are only tools of decision-making, i.e., they are necessary conditions & are not sufficient condition for final decision.
- There are many other non- quantitative and non-economic criteria for making final decision of whether to accept or reject a project.

6.1 Undiscounted Measures of Project Worth

1. Ranking by inspection

- Some cases, we can tell by simply looking at the investment costs and the 'shape' of the stream for the net value of incremental production that one project should be accepted over another if we must choose.

- The analyst can sometimes simply choose one project among alternatives projects by examining the following:

  - Total cost of investment and investment period;
  - The structure & amount of costs and benefits;
  - The structure & total amount of the net incremental benefit;
  - The lifetime of the project, etc.

- The problem with this method is that the selection lacks objectivity.

Cont'd

2. Payback Period

- The payback period is the length of time from the beginning of the project until the sum of net incremental benefits of the project equal to total capital investment.
- It is the length of time that the project requires to recover the investment cost.
- The method is very simple. Moreover, it is a good measure when the project has problem of liquidity.
- The pay-back period is also a common, rough means of choosing among projects in business enterprise, especially when the choice entails high degree of risk.

Con't

- This method has two important weaknesses:
- First, it fails to consider the time & amount of net benefits after the payback period.
- Second, it does not adequately take into account the time value of money even in the payable periods.

Cont'd

Consider the following alternative projects

Alternative projects	Year	Investment cost	Net incremental benefits	Commutation net incremental benefits
I	1 2 3 4 5	20000	- 2000 8000 10000 9000	29000
II	1 2 3 4 5	20000	- 200 12000 8000 12000	32000
III	1 2 3 4 5 6 7 8	20000	- 1000 5000 6000 8000 10000 5000 2000	37000

* Note that the incremental net benefit could be financial or economic incremental net benefits.

Cont'd

- Project I & II have a payback period of 4 year. But project III has a payback period of 5 years.
- Thus, based on this criterion, project I & II have equal higher rank than project III.
- Therefore, the method fails to consider the time & amount of net incremental benefit after the payback period- project III.
- In addition, the method results equal rank for both project I and II.

6.2 Discounted measure of project worth

Time Value of Money

- Present values are better than the same values in the future and earlier returns are better than later.
- This shows that money has time value. Thus, to include the time dimension in our project evaluation, we have to use discounting methods.
- Discounting is essentially a technique that ‘reduces’ future benefits and costs to their ‘present worth’.
- The rate used for discounting is called discount rate.

Cont'd

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- **Compounding**: Interest rates reflect time values as defined by the financial markets. To determine future value of money, therefore, a compound interest rate is applied and this process is generally referred to as compounding. The future value is determined by multiplying the present value by the expression: $(1+i)^t$
- Where: i = interest rate and t = the number of years.

Cont'd

- Future values (FV) are obtained by the formula FV = PV $(1 + r)^t$ .The expression: $(1 + r)^t$ is a compounding factor.

- **Discounting**: Discounting is the opposite of compounding and the process involves finding the present value or worth of a future amount. The present worth of a future amount is determined by multiplying the future amount by the following expression, also known as the discount factor:

- The value in a year 1 is the present value (PV) and the procedure for determining it is called discounting. The expression: $1/ (1 + r)^t$ is a discount factor.

Cont'd

- Suppose a bank lends 1567.05 Birr for a project at 5% interest rate. The project owner is supposed to repay the principal & interest rate after 5 years. How much the owner will have to pay at the end of 5 years?
- At -= P (1 + r) t
- At = total amount after t years
- r = interest rate
- t = time
- A5 = 1567.05 (1 + 0.05)5
- = 2000 B

Cont'd

- Suppose again a project is expected to obtain 2000 B after 5 years. Value of this money today can be calculated as:

$$P = \frac{At}{(1+r)^t} = \frac{2000}{(1+0.05)^5} = \underline{\underline{1567.05}}$$

- The difference between this & the previous is only the viewpoint.

- The interest rate used for compounding assumes a viewpoint from here to the future, whereas discounting looks back ward form the future to the present.

Cont'd

1. Net present values

- The net present value of an investment proposal is the present value of expected future benefit, discounted at the costs of capital, less discounted cost.

$$NPV = \sum_{t=1}^{n} \frac{NB}{(1+r)^t}$$

NPV = net present value

NB= net benefit

r = cost of capital or discount rate

t = life of the project

Cont'd

2. Benefit cost ratio

- The ratio of discounted benefit over discounted cost

$$BCR = \frac{\Sigma((B/(1+r)^t)}{\Sigma((C/(1+r)^t)}$$

BCR = Benefit cost ratio

$(B/(1+r)^t)$ = discounted benefit

$(C/(1+r)^t)$ = discounted cost

r = cost of capital or discount rate

t = life of the project

Cont'd

3. Internal rate of return

- The discount rate which makes the net present value of an investment project equal to zero. This is a widely used method of investment appraisal as it takes into account the timing of cash flows. It is the value of *r* in the following equation.

$$I = \sum_{t=1}^{n} \frac{At}{(1+r)^t}$$

I – investment cost

A_t – Net benefit for year t

r - IRR

n - Life of the project

Cont'd

Suppose a project has the following net benefit flows of its project life of 4 years.

Year	Net Benefit
0	-100
1	200
2	400
3	500
4	700

Cont'd

- The IRR can be calculated as:

$$1000 = \frac{200}{(1+r)^1} + \frac{400}{(1+r)^2} + \frac{500}{(1+r)^3} + \frac{700}{(1+r)^4}$$

r can be found through trial & error method.

- When r = 23.068 percent the value in the above equation in the right hand side will be equal to 1000.0087 which is equal to the value in the left hand side.
- The problem with this method is that the value of r (IRR) can only be found by trial and error.

Decision To Accept or Reject The Project

NPV> or = 0

BCR> or = 1

IRR> or = r

Chapter 5

Economic and social cost-benefit Analysis

5.1 Determining Economic and social Values

- Once financial prices or costs and benefits have been determined and entered in the project accounts, the analyst estimates the economic value of a proposed project to the nation as a whole.

- The financial prices are the starting point for the economic analysis; they are adjusted as needed to reflect the value to the society as a whole of both the inputs and outputs of the project.

Cont,d

- Economic analysis – analysis done using economic values.
- In general, economic analysis omits transfer payments (including credit transactions) and values all items at their value in use or their opportunity cost to the society (often a border price for traded items).

- When the market price of any good or service is changed to make it more closely represent the opportunity cost (the value of a good or service in its next best alternative use) to the society, the new value assigned becomes the "shadow price" (sometimes referred to as an "accounting price").

Cont'd…

- In economic analysis the most important question is whether or not the project under study is beneficial to the national economy.

- Economic analysis is, therefore, conducted to identify costs and benefits where there is a significant divergence between market prices and economic costs or values, and its application is important in the selection of economically viable projects for Public Investment Program (PIPs) or Public Expenditure Program (PEP).

5.1.1 Purpose of economic analysis

- To ensure that public investment funds are used only for economically viable projects.
- To ensure that a convincing economic case can be made for PIP or PEP projects to benefit from external funding.

❖ Economic analysis is less likely to be needed when:

- The project is small (unless it is a pilot project likely to be replicated),
- The project is financially viable and although to producing primary for the local market, is receiving no significant protection and involves no significant negative externalities and no significant use of under valued local resources.

What is opportunity cost?

- The value of the alternative foregone by choosing a particular activity.
  - For example, suppose a farmer produces both rice and maize hut applies all his available fertilizer to rice. If instead he transferred some of the fertilizer to his maize, he would reduce the value of his rice production somewhat, hut he might gain a much higher value of increased maize production. The value of his rice production forgone would be the opportunity cost of the fertilizer used for maize production.

  - The opportunity cost of land can be investigated by asking what the alternative use of the land might be. Urban land can be used for houses, offices, shops, factories, and the like. Rural land is normally used for crops, pasture or forestry.

5.2 Economic Benefit and Cost Analyses

- A project will be profitable to society if the economic benefits of the project exceed the economic costs or to put in another way, if the net present value of the project to society is grater than zero.

- The question is, how should a projects economic benefits and costs be measured, and what common unit of account (or *numéraire*) should the benefits & cots be expressed in, given a societies objectives & the fact that it has trading opportunities with the rest of the world so that it can sell and buy outputs & inputs abroad (so that domestic & foreign goods will be made comparable).

Cont'd

- Broadly, there are two methods of measuring economic costs & benefits of a project: UNIDO approach and Little-Mirrlees approach.

UNIDO approach

- In this method economic benefits & costs may be measured at domestic prices using consumption as the *numiraire*, with adjustment made for divergence between market prices and economic values, and making domestic and foreign resources comparable using shadow exchange rate (SER).

Cont'd

- In this method, if commodities are traded, first all these traded goods will be adjusted for any distortions in the domestic markets.
- After this adjustment is made the adjusted domestic price will be multiplied by SER to make domestic resources be comparable with foreign resources.

- The easiest way for adjusting domestic market distortions is to use border prices, *c.i.f.*, for imports and *f.o.b.* for exports and then multiply this border price expressed in foreign currency by SER to arrive at economic border prices.

Cont'd…

- But, if the commodities are non-traded, i.e. if *f.o.b.* prices are less than domestic prices & domestic prices less than *c.i.f.* prices and if the market prices are good estimates of opportunity cost or willingness to pay, we directly take the market price as economic value of the item.

- But if the prices of non-traded items (goods and services or factors of production) are distorted, we will adjust the market price to eliminate distortions and then use these estimates of opportunity cost as the shadow price to be entered in the economic analysis.

Cont'd

- This method can be summarized by the following example. Suppose we have a project producing export item that uses both foreign & domestic inputs. The net benefit (ignoring discounting) would be estimated as:

- Net benefit= SER(X-M)-D
- Where X - border price of exports in foreign currency

  M - border price of imported goods in foreign currency

  D - adjusted (economic) values of domestic goods in domestic currency

Cont'd…

- SER - is the shadow exchange rate (assuming the official exchange rate does not accurately reflect the true value of foreign currencies to the economy).

- Where SER= $\frac{\text{DP (domestic price)}}{\text{WP (world price)}}$

Little-Mirrlees approach

- The other method of adjusting market prices into economic prices is the Little-Mirrlees approach (see Little & Mirrlees, 1969, 1974).

- In this approach benefits and costs may be measured at world price to reflect the true opportunity cost of outputs and inputs using public saving measured in foreign exchange as the *numéraire* (that is, converting everything into its foreign exchange equivalent).

- The fact that foreign exchange is taken as a *numéraire* does not mean that project accounts are necessarily expressed in foreign currency.

Cont'd…

- The above adjustment applies for traded goods (imported or exported goods). But if the goods or inputs in question are non-traded goods, the analyst needs to use conversion factor to translate domestic prices into their border price equivalent.

- A conversation factor (CF) is the ratio of the economic (shadow) price to the market price, that is:

$$CF = \frac{\text{economic price}}{\text{market price}}$$

- Taking the following example can summarize Little-Mirrlees approach of adjusting domestic prices into economic prices. A project that produces export goods can be assessed as follows.

Cont'd…

- Net Present Value (NPV) = OER (X-M) - SCF.D

Where -OER- official exchange rate

X- exported goods in foreign currency

M- imported goods in foreign currency

SCF- standard conversation factor

D- price of non-traded goods in domestic currency

- To summarize, as long as SCF is the ratio of OER to SER, the two approaches - UNIDO and Little-Mirrless - differ only to the extent that SER is different from the actual exchange rate.

5.2.1Economic Export and Import Parity Price

Export Parity Price

C.i.f. at point of import (say, Canada port)

Deduct- unloading at point of import

Deduct- freight to point of import (in this case air freight)

Deduct – insurance

Equals – *f.o.b.* at point of export (A.A)

Convert foreign currency to domestic currency at official exchange rate (OER) if you are using the L-M approach or shadow exchange rate (SER) if you are using UNIDO approach

Cont'd…

Deduct - local port charges

Deduct - local transport & marketing (if not part of project) at their economic price and multiply it by SCF in L-M approach

Equals *export parity price* at project boundary

Deduct - local storage, transport & marketing costs (if not part of project cost) at their economic price and multiply it by SCF in L-M approach

Equal *economic export parity price at project location* (farm gate)

Cont'd…

- A parallel computation leads to the economic import parity price. Here the issue can be finding the price of project's output that is intended to substitute previous imports or the project will use imported inputs. In either case, the import parity price can be derived as follows.

Import Parity Price

F.o.b. price at point of export

Add-freight charges to point of import

Add-insurance charges

Add- unloading from ship to pier at port

C.i.f. Price at the harbor of importing countries

Cont'd…

- Convert foreign currency to domestic one (multiply by OER) if you use L-M approach and SER if you use UNIDO approach

Add-local port charges

Add-transport & marketing costs to relevant wholesale market at economic price and multiply it by SCF in L-M approach

Equal price at wholesale market

Deduct-local storage & other marketing costs at economic price and SCF in L-M approach (if not part of project cost) -this is the marketing margin between central market and the project site. If the project uses imported inputs, we have to add this cost to the project.

Equals *economic import parity price* at project location (Farm/project gate price)

Cont'd...

- There is conceptual difference between social costs - benefits and economic cost - benefit analysis. The results of social cost-benefit analysis may diverge from the results of economic cost-benefit analysis.

- Economic costs and benefits when they are adjusted to consider other objectives of society as distributional consequences & other objectives, they become social costs & benefits of a project. This depends on the method used in the analysis. If the market prices are adjusted only for market distortions of various kinds; direct transfer payments & externalities, it is simply economic cost-benefit analysis.

- If on the other hand this adjustment process systematically considers other objectives as distributional aspects, it will become social cost-benefit analysis.

5.2.2 Adjusting Financial Prices to Economic Values

- We will divide these into three steps:

(1) adjustment for direct transfer payments

- The first step in adjusting financial prices to economic values is to eliminate direct transfer payments.

(2) adjustment for price distortions in traded items, and

- Traded items are those for which, if exports , f.o.b. price > domestic cost of production, or the items may be exported through government intervention by use of export subsidies and the like, and, if imports , domestic cost of production > c.i.f. price.
- Conceptually-and usually in practice, too-prices for traded items in project analysis are more easily dealt with than those for non-traded items. We begin the valuation by determining the "border price." For imports, this normally will be the c.i.f. price and, for exports, normally the f.o.b. price.

cont'd…

- The border price is then adjusted to allow for domestic transport and marketing costs between the point of import or export and the project site; the result is the efficiency price to be used in the project account

(3) **adjustment for price distortions in non-traded items.**

- The third step in adjusting financial prices to economic values is the adjustment for distortions in market prices of non-traded items. Non-traded items are those for which c.i.f. price > domestic cost of production > f.o.b. price, or the items are non-traded because of government intervention by means of import bans, quotas, and the like.
- Often, non-traded items will be bulky goods such as straw or bricks, which by their very nature tend to be cheaper to produce domestically than to import but for which the export price is lower than the domestic cost of production. In other instances, non-traded items are highly perishable goods such as fresh vegetables or fluid milk for direct consumption.

cont'd…

Summary

- In agricultural projects, the most common transfer payments are taxes, direct subsidies, and credit transactions that include loans, receipts, repayment of principal, and interest payments. Two credit transactions that might escape notice are accounts payable and accounts receivable. All these entries should be taken out before the financial accounts are adjusted to reflect economic
- A non-tradable good is defined as when:

  c.i.f. $\geq$ Local Cost of Production $>$ f.o.b.
- A tradable good would be subject to one of the following conditions:

  Importable good: c.i.f. $\leq$ local production cost

  Exportable good: f.o.b. $\geq$ local production cost

5.2.3 Social Aspect

- The process of development is inherently social, dealing as it does with the improvement of social conditions and working through social structures to achieve these objectives.
- It is, therefore, crucial to integrate comprehensive social assessment into the project formulation process.
- The precise role of social assessment can be defined as ensuring that people, their capacities, values and needs are put at the centre of the development process.
- Project planners must make careful consideration of social factors when formulating projects. Experience has shown that ignorance of these factors can lead to project failure.

cont'd…

- Project formulators who have designed projects by applying expert knowledge without stakeholder consultation have often failed to achieve positive results.

- If social assessment is primarily concerned with ensuring that projects, and consequently the development process, are 'people- centered' then the following points must be taken into account in any project formulation exercises. These are:

  - Identifying of stakeholders and target groups: people, groups, communities and institutions
  - Participation issues: create awareness
  - Social impact assessment (SIA):is a term used to classify the process of assessing how the benefits (and Costs) of a project are distributed amongst various stakeholders over time
  - Assessing of mitigation measures, strategies and costs of SIA.

Chapter 5

Economic and social cost-benefit Analysis

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Cont,d

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Cont'd

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Cont'd

- In this method, if commodities are traded, first all these traded goods will be adjusted for any distortions in the domestic markets.
- After this adjustment is made the adjusted domestic price will be multiplied by SER to make domestic resources be comparable with foreign resources.

- The easiest way for adjusting domestic market distortions is to use border prices, *c.i.f.*, for imports and *f.o.b.* for exports and then multiply this border price expressed in foreign currency by SER to arrive at economic border prices.

Cont'd…

- But, if the commodities are non-traded, i.e. if *f.o.b.* prices are less than domestic prices & domestic prices less than *c.i.f.* prices and if the market prices are good estimates of opportunity cost or willingness to pay, we directly take the market price as economic value of the item.

- But if the prices of non-traded items (goods and services or factors of production) are distorted, we will adjust the market price to eliminate distortions and then use these estimates of opportunity cost as the shadow price to be entered in the economic analysis.

Cont'd

- This method can be summarized by the following example. Suppose we have a project producing export item that uses both foreign & domestic inputs. The net benefit (ignoring discounting) would be estimated as:

- Net benefit= SER(X-M)-D
- Where X - border price of exports in foreign currency

  M - border price of imported goods in foreign currency

  D - adjusted (economic) values of domestic goods in domestic currency

Cont'd…

- SER - is the shadow exchange rate (assuming the official exchange rate does not accurately reflect the true value of foreign currencies to the economy).

- Where SER= $\frac{\text{DP (domestic price)}}{\text{WP (world price)}}$

Little-Mirrlees approach

- The other method of adjusting market prices into economic prices is the Little-Mirrlees approach (see Little & Mirrlees, 1969, 1974).

- In this approach benefits and costs may be measured at world price to reflect the true opportunity cost of outputs and inputs using public saving measured in foreign exchange as the *numéraire* (that is, converting everything into its foreign exchange equivalent).

- The fact that foreign exchange is taken as a *numéraire* does not mean that project accounts are necessarily expressed in foreign currency.

Cont'd…

- The above adjustment applies for traded goods (imported or exported goods). But if the goods or inputs in question are non-traded goods, the analyst needs to use conversion factor to translate domestic prices into their border price equivalent.

- A conversation factor (CF) is the ratio of the economic (shadow) price to the market price, that is:

$$CF = \frac{\text{economic price}}{\text{market price}}$$

- Taking the following example can summarize Little-Mirrlees approach of adjusting domestic prices into economic prices. A project that produces export goods can be assessed as follows.

Cont'd…

- Net Present Value (NPV) = OER (X-M) - SCF.D

Where -OER- official exchange rate

X- exported goods in foreign currency

M- imported goods in foreign currency

SCF- standard conversation factor

D- price of non-traded goods in domestic currency

- To summarize, as long as SCF is the ratio of OER to SER, the two approaches - UNIDO and Little-Mirrless - differ only to the extent that SER is different from the actual exchange rate.

5.2.1Economic Export and Import Parity Price

Export Parity Price

C.i.f. at point of import (say, Canada port)

Deduct- unloading at point of import

Deduct- freight to point of import (in this case air freight)

Deduct – insurance

Equals – *f.o.b.* at point of export (A.A)

Convert foreign currency to domestic currency at official exchange rate (OER) if you are using the L-M approach or shadow exchange rate (SER) if you are using UNIDO approach

Cont'd…

Deduct - local port charges

Deduct - local transport & marketing (if not part of project) at their economic price and multiply it by SCF in L-M approach

Equals *export parity price* at project boundary

Deduct - local storage, transport & marketing costs (if not part of project cost) at their economic price and multiply it by SCF in L-M approach

Equal *economic export parity price at project location* (farm gate)

Cont'd…

- A parallel computation leads to the economic import parity price. Here the issue can be finding the price of project's output that is intended to substitute previous imports or the project will use imported inputs. In either case, the import parity price can be derived as follows.

Import Parity Price

F.o.b. price at point of export

Add-freight charges to point of import

Add-insurance charges

Add- unloading from ship to pier at port

C.i.f. Price at the harbor of importing countries

Cont'd…

- Convert foreign currency to domestic one (multiply by OER) if you use L-M approach and SER if you use UNIDO approach

Add-local port charges

Add-transport & marketing costs to relevant wholesale market at economic price and multiply it by SCF in L-M approach

Equal price at wholesale market

Deduct-local storage & other marketing costs at economic price and SCF in L-M approach (if not part of project cost) -this is the marketing margin between central market and the project site. If the project uses imported inputs, we have to add this cost to the project.

Equals *economic import parity price* at project location (Farm/project gate price)

Cont'd...

- There is conceptual difference between social costs - benefits and economic cost - benefit analysis. The results of social cost-benefit analysis may diverge from the results of economic cost-benefit analysis.

- Economic costs and benefits when they are adjusted to consider other objectives of society as distributional consequences & other objectives, they become social costs & benefits of a project. This depends on the method used in the analysis. If the market prices are adjusted only for market distortions of various kinds; direct transfer payments & externalities, it is simply economic cost-benefit analysis.

- If on the other hand this adjustment process systematically considers other objectives as distributional aspects, it will become social cost-benefit analysis.

5.2.2 Adjusting Financial Prices to Economic Values

- We will divide these into three steps:

(1) adjustment for direct transfer payments

- The first step in adjusting financial prices to economic values is to eliminate direct transfer payments.

(2) adjustment for price distortions in traded items, and

- Traded items are those for which, if exports , f.o.b. price > domestic cost of production, or the items may be exported through government intervention by use of export subsidies and the like, and, if imports , domestic cost of production > c.i.f. price.
- Conceptually-and usually in practice, too-prices for traded items in project analysis are more easily dealt with than those for non-traded items. We begin the valuation by determining the "border price." For imports, this normally will be the c.i.f. price and, for exports, normally the f.o.b. price.

cont'd…

- The border price is then adjusted to allow for domestic transport and marketing costs between the point of import or export and the project site; the result is the efficiency price to be used in the project account

(3) **adjustment for price distortions in non-traded items.**

- The third step in adjusting financial prices to economic values is the adjustment for distortions in market prices of non-traded items. Non-traded items are those for which c.i.f. price > domestic cost of production > f.o.b. price, or the items are non-traded because of government intervention by means of import bans, quotas, and the like.
- Often, non-traded items will be bulky goods such as straw or bricks, which by their very nature tend to be cheaper to produce domestically than to import but for which the export price is lower than the domestic cost of production. In other instances, non-traded items are highly perishable goods such as fresh vegetables or fluid milk for direct consumption.

cont'd…

Summary

- In agricultural projects, the most common transfer payments are taxes, direct subsidies, and credit transactions that include loans, receipts, repayment of principal, and interest payments. Two credit transactions that might escape notice are accounts payable and accounts receivable. All these entries should be taken out before the financial accounts are adjusted to reflect economic
- A non-tradable good is defined as when:

  c.i.f. $\geq$ Local Cost of Production $>$ f.o.b.
- A tradable good would be subject to one of the following conditions:

  Importable good: c.i.f. $\leq$ local production cost

  Exportable good: f.o.b. $\geq$ local production cost

5.2.3 Social Aspect

- The process of development is inherently social, dealing as it does with the improvement of social conditions and working through social structures to achieve these objectives.
- It is, therefore, crucial to integrate comprehensive social assessment into the project formulation process.
- The precise role of social assessment can be defined as ensuring that people, their capacities, values and needs are put at the centre of the development process.
- Project planners must make careful consideration of social factors when formulating projects. Experience has shown that ignorance of these factors can lead to project failure.

cont'd…

- Project formulators who have designed projects by applying expert knowledge without stakeholder consultation have often failed to achieve positive results.

- If social assessment is primarily concerned with ensuring that projects, and consequently the development process, are 'people- centered' then the following points must be taken into account in any project formulation exercises. These are:

  - Identifying of stakeholders and target groups: people, groups, communities and institutions
  - Participation issues: create awareness
  - Social impact assessment (SIA):is a term used to classify the process of assessing how the benefits (and Costs) of a project are distributed amongst various stakeholders over time
  - Assessing of mitigation measures, strategies and costs of SIA.