

Lecture notes

Course No: AECON 311

Course Title: AGRIBUSINESS MANAGEMENT

No. of credits: 3 (2+1)

Lecture 1

Agribusiness – Meaning - Definition – Structure of Agribusiness (Input sector, Farm sector and Product sector) – Importance of Agribusiness in Indian Economy.

AGRIBUSINESS:

Agri-business as a concept was born in Harvard University in 1957 with the publication of a book “A concept of Agri-business”, written by *John David and A. Gold Berg*. It was introduced in Philippines in early 1966, when the University of the Philippines offered an Agri-business Management (ABM) programme at the under-graduate level. In 1969, the first Advanced Agri- business Management seminar was held in Manila.

Definition of Agri-business:

“Agri-business is the sum total of all operations involved in the manufacture and distribution of farm supplies, production activities on the farm, storage, processing and distribution of farm commodities and items made from them” (*John David and Gold Berg*)

Agri-business involves three sectors:

1. Input sector: It deals with the supply of inputs required by the farmers for raising crops, livestock and other allied enterprises. These include seeds, fertilizers, chemicals, machinery and fuel.
2. Farm sector: It aims at producing crops, livestock and other products.
3. Product sector: It deals with various aspects like storage, processing and marketing the finished products so as to meet the dynamic needs of consumers.

Therefore, Agribusiness is sum total of all operations or activities involved in the business of production and marketing of farm supplies and farm products for achieving the targeted objectives.

Importance of Agri-business:

1. It deals with agricultural sector and also with the portion of industrial sector, which is the major source of farm inputs like fertilizers, pesticides, machines, processing and post harvest technologies.
2. It suggests and directs the government and private sectors for development of sub sectors.
3. It contributes a good part of the national economy.

Dimensions of Agri-business:

1. It deals with different components of both *agricultural and industrial sector*, their inter- dependence and influence of one sector on other.
2. It deals with *decision making process* of farm either private or government in relation to production and selling aspects.
3. It deals with *strengths and weaknesses of a project* and thereby their viability in competing enterprises.
4. Agri-business is always *market oriented*.

5. Structure of Agri-business is generally vertical and it comprises the following
 - a. Govt. policies and programmes regarding raising of crops or taking enterprises etc.,
 - b. Research and extension programmes of the Govt.
 - c. Farm supplies or inputs
 - d. Agricultural production
 - e. Processing
 - f. Marketing of agricultural products

Scope of Agri-business:

- 1) Our daily requirements of food and fiber products *at desired place at required form and time* come from efficient and hard working of many business personnel in input, farm and food production and also in marketing them. The entire system in brief is called Agri- business.
- 2) Agribusiness, of late, is combining the diverse commercial enterprises, using heterogeneous combination of labour, materials, capital and technology.
- 3) It is a dynamic sector and continuously meets current demands of consumers in domestic and world markets.
- 4) Agri-business establishment leads to *strengthening of infrastructural facilities* in that area, expansion of credit, raw materials supply agencies, adoption of modern technology in production and marketing of agricultural products.
- 5) Agri-business provides crucial *forward and backward linkages*.
(Backward linkage include supply of inputs, credit, production technologies, farm services etc.,
A forward linkage includes storage, processing, transportation and marketing aspects.)
- 6) Agri-business generates potential *employment opportunities*.
- 7) It adds value to products and thereby increases the net profits.

Structure of Agri-business:

As mentioned earlier agri-business sector provides crucial backward and forward linkages. It involves two important sectors.

1. Farm input sector: It deals with agro-based industries providing seeds, fertilizers, feed, chemicals etc., The industries supplying machinery or equipment, implements and petroleum etc are also important in this regard.
2. Farm product sector: It deals with production and distribution of farm commodities. Large co- operative bodies also exist in Agri-business, but they are few in number, whereas small scaled agro- industries are large in number. The vertical integration of a farm is very common in poultry, fruit and vegetable farms.

(Horizontal integration: If one firm assumes the functions of other firm is called the horizontal integration Ex: Co-operative marketing societies, Co-operative farming societies.

Vertical integration: If one firm assumes other functions which are having close relationship.

- a. If one firm assumes other functions (succeeding) related to *consumption function* is called forward integration.
Ex: A wholesaler firm assuming the function of a retailer.

- b. If one firm assumes the other functions (proceeding) related to the *production function* is called backward integration.

Ex: A wholesaler firm assumes the functions such as assembling, processing, packing etc.,

Conglomerate integration: If one firm assumes several functions which do not have any relationship.

Ex: Hindustan Lever Ltd.)

Lecture 2

Agribusiness Management - The distinctive features of Agribusiness Management- The importance of good management - Definitions of Management.

Distinctive Features of Agri-business Management:

The important distinctive features or the principle characteristics of agribusiness are as follows:

1. *Management varies from business to business* depending on the kind and type of business. It varies from basic producer to brokers, wholesalers, processors, packagers, manufacturers, storage proprietors, transporters, retailers etc.,
 2. Agri-business is very large and evolved to handle the products through various marketing channels from producers to consumers.
 3. Management varies with several million of farmers who produce hundreds of food and livestock products
 4. There is *very large variation in the size of agri-business*; some are very large, while many other are one person or one family organization.
 5. Most of the Agri-business units are *conservative and subsistence* in nature and family oriented and deal with business that is run by family members.
 6. The production of Agri-business is seasonal and depends on farm production. They deal with vagaries of nature.
 7. Agri-business is always market oriented.
 8. They are by far vertically integrated, but some are horizontally integrated and many are conglomerated.
 9. There is direct impact of govt. programmes on the production and performance of Agri- business.
- ✓ People in many countries flock to the cities, complicating the problem of food, transportation, distribution and marketing. In the developing new nations, this marks the beginning of a shift from subsistence farming to commercial agriculture. The commercial agriculture can not exist with out the support of Agri-business and other industries.
 - ✓ The hungry countries are usually those with the highest percentage of their people in farming. This is because of their farmers are still close to subsistence farming. The role of agricultural economist is to advice farmers on the commodities to be produced and the most economical methods of combining resources so as to maximize profits from the farm.

MANAGEMENT

Definitions:

- Management is the *administration of business concerns* of public undertaking.
- It is *decision making process through which purposes and objectives of business firms* or organizations or human groups are *determined, clarified and effectuated*.
- MANAGEMENT is the whole activities by means of which the business units direct their desired actions towards achieving their set goals.
- It is accomplishment of desired objectives through establishing an environment favourable to performance by people operating in organized groups.
- Management is *unifying and coordinating action, which combines different activities of individual personnel into meaningful and purposeful group endeavour*.

Hence, management in brief is the *efficient use of men, material and resources towards achieving specific objectives*.

In order to achieve the desired objectives of an organisation through group action, “MANAGEMENT” is a must to direct, coordinate and integrate the activities and affairs of the organisation.

Manager: Manager is defined as a person, who provides the organization with leadership and who acts as a catalyst for change. Good managers are most effective and permit desirable changes.

Ordinarily there are the two main functions of each manager: Decision Making and Implementation.

Elements of good management:

1. There are two dimensions of it. Human dimension: It is related to skill and ability of people. Technical dimension: It is related to intellectual capacity of people thereby efficient execution of activities. Among these two, human dimension is very important.
2. Management is an art but not science. But every manager should use the Management principles, knowledge, skill and past experience as guidance to successfully operate the firm.
3. Good management is the key to success of firm
4. Successful managers stimulate highest potential returns from the given resources by recognizing the optimality of input use, enterprise combination and by minimizing the risk through plans and programmes.

Concepts of Management

1. Some describe Management as division of the area of responsibility into finance, marketing, production and personnel.
2. Others look at the Management as six M concepts. These are money, market, materials, machinery, methods and manpower. Here the management is conceptualized as effective use of resources available.

3. Another concept is its division into approaches and processes. This includes industrial engineering management, institutional or organizational management and behavioral management.
4. Another concept is functional approach to management.

Functional Approach to management:

Recently developed concept of management, is to view management as series of functions. These are:

1. Planning
2. Organizing
3. Directing
4. Controlling
5. Co-ordinating
6. Communicating
7. Motivating

Execution of these functions is important for success of business firm. In fact, this is the best concept of management.

✓ Some management specialists have divided the functions as main and subsidiary as below: Main

functions

1. Planning
2. Organizing
3. Staffing
4. Directing
5. Controlling
6. Co-ordinating
7. Motivating

Subsidiary functions

1. Communication
2. Decision making
3. Innovation

✓ Management is needed to convert the disorganised resources of men, machines , materials and methods into useful and effective enterprise

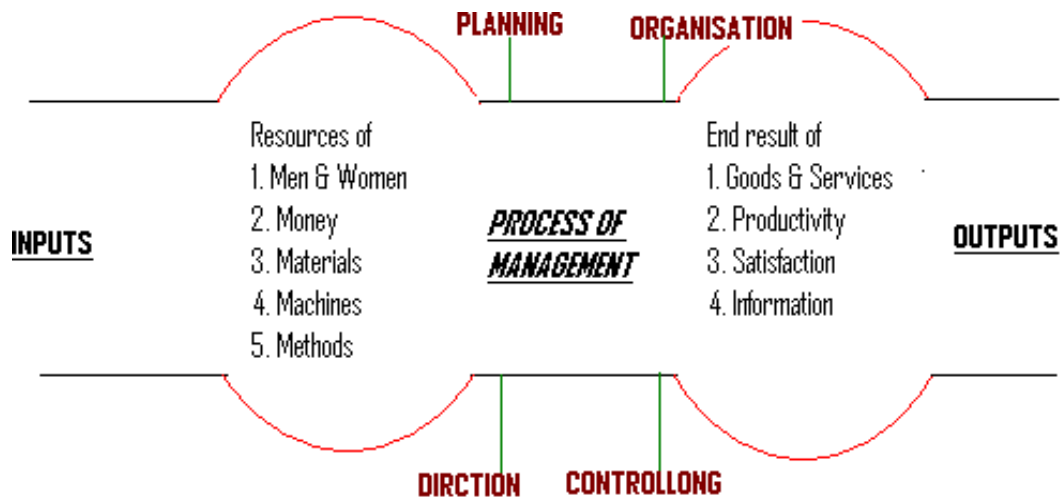


Fig: Management is reprinted as a pipe line diagram

- It is like a *pipeline*; the inputs are fed at the one end and they are processed through management functions like planning, organising, directing and controlling and ultimately we get the end results or outputs in the form of goods and services, productivity, satisfaction, information etc.,
- It is the unifying and coordinating activity which combines the sections of individuals into meaningful and purposeful endeavour.
- The purpose of management is to achieve certain organisational ends and to maintain or improve the ability of an organisation to efficiently achieve objectives.
- The essence of management is coordination of people and functions.
- The manager directs and controls the organisation and its activities towards chosen objectives.

Management can also be represented as a wheel:

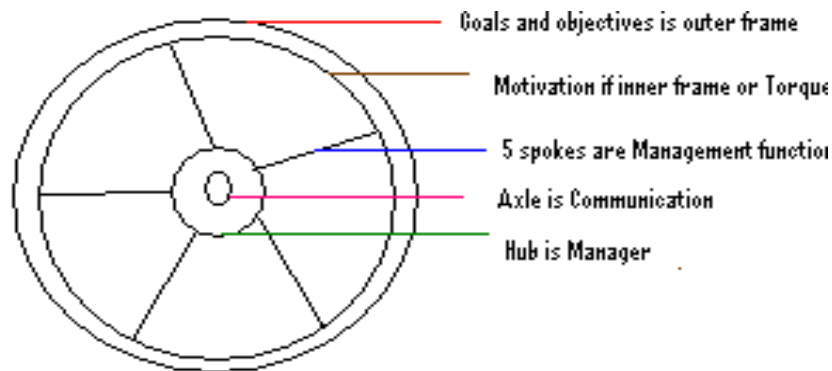


Fig: Management is represented as Wheel Diagram

- ➔ Manager: Hub
 - ➔ Functions of management: 5 spokes (planning, organization, directing, controlling & Coordinating)
 - ➔ Communication: Axle Motivation:
 - ➔ Torque or speed
 - ➔ Goals or Objectives: Outer frame of the wheel
-
- Each management function is compared to each spoke of the wheel.
 - The axle on which the entire wheel of management turns is communication. With out good communication the wheel of management begins to unstable.
 - Motivation is compared to speed and torque with which the functions are done.
 - Goals are tied to outer frame of the wheel.
 - Poor management can hold back progress of the agri-business. It is the not the matter how hard the manager works in the given situation, but how intelligently he solves the problem and handles to the success of the firm is important.

SIX ELEMENTS OF DECISION MAKING PROCESS:

1. Being aware of the opportunities
2. Establishment of objectives
3. Development of premises
4. Discovering alternate courses of action
5. Budgeting
6. Establishing and the best course of action selected followed by evaluation

Lecture No. 3 & 4

Management Functions - Planning, Characteristics of sound plan – steps in planning.

PLANNING:

Planning is the process by which a manager looks to the future and discovers alternate courses of action. Planning describes the adoption of specific programme in order to achieve desired results. It means the selection from among alternatives of future courses of action for the enterprise as a whole and each department with in it. It is determining goals, policies and courses of action and it involves the processes like work scheduling, budgeting, setting up procedures, setting goals or standards, preparing agenda and programming.

In the body of management knowledge, Planning is the *MUSCLE* and it allows the other functions to move in the desired direction. Planning is not a forecast but an *action oriented* statement.

Definition:

The *forward thinking* (looking ahead) about *course of action* or *activity* (developing alternatives) based on full understanding of all the related factors and directed at specified objectives.

Why we need planning? Importance of planning:

1. Agri-business is a more complex activity.
2. Planning is essential for the business survival and development.
3. Planning reduces risks and safeguards against uncertainty.
4. It helps to achieve the objectives or goals and thereby move the things in a right direction.
5. It improves operational efficiency of resources
6. It is most basic function of management and a requisite to other functions.
7. Planning is an antecedent process. Planning process may be divided into different steps, such that a highest priority will be given to immediate need and later to the less priority needs.
8. After dividing the entire planning process in to different steps, the problems are stated and objectives are framed. These problems and objectives will serve as boundaries for thinking process to prepare a plan of action.
9. While stating problems and objectives certain assumptions should be made depending up on situation which may or may not be under the control of management. After stating the objectives and assumptions, the plan of action will be prepared to accomplish objectives and goals.
10. Planning necessitates faithfulness to objectives.

Types / Levels of planning: In agri-business planning may be of several types.

1. Financial planning
2. Industrial relations planning
3. Research and development planning
4. Physical facilities planning

POLICY LEVEL	MIDDLE LEVEL	SUPERVISOR LEVEL	PRODUCTION LEVEL
Very flexible	Somewhat flexible	Discretionary changes	Inflexible
Long range	Intermediate term	Short term	Immediate

Written	Written	Outlined	Unwritten
Analyses	Reports	-	-
Complex	Less detailed	Highlighted	Simple
detailed	Outlined	-	-
Broad	General	Some what specific	Very specific

- The above table shows the different levels at which various types of planning occur.
Planning moves from chief executive to the worker. Several notable changes occur in between.
- At the top level plans have a tendency towards flexibility, are longer range, are usually written, are more complex, and are broader in nature. At production (lower) they are vice versa as shown in above table.
- All the plans would benefit from being written down because written plans tend to consolidate thoughts, are easier to communicate, and to provide a source for further reference.
- The executives make plans that are generally add or subtract resources from the agribusiness, while those plans that are made at the lower levels generally relate to using the existing resources in the most efficient manner.

Characteristics/ attributes / features of a sound (good) plan:

1. The objectives formulated in plan should be with in available resources and available information. *(Generally while setting the objectives for any enterprise the important factors to be kept in mind are: Market share and market stand among the competitors, How fast in growth?, amount of profits?, employee's relation and performance, profit distribution percentage, public relations, kind of equipment needed, research for new products etc.,)*
2. The plan should be flexible i.e. it can be suitably changed according to situations.
3. The plan should increase the resource use efficiency and should reduce wastage.
4. The objectives formulated in plan should be very clear without any confusion
5. The plan should carry various alternative courses of action with in available resources.
6. The plan should employ modern techniques in production and marketing of agricultural products.
7. Plan should stabilize the earnings of the firm.
8. plan should avoid possible risks and uncertainties
9. Plan should give consideration for efficient marketing of products.
10. Plan should provide programme for obtaining usage and repayment of credit and loan.

Six steps involved in the planning process:

1. Gathering the facts and information that have a bearing on the situation. (Assessment of resources available with business firm)
2. Analyzing what the situation is and what problems are involved? (Analyzing the existing operations in business firm)
3. Forecasting the future developments (Identification of defects in existing plan of business firm)
4. Setting goals, the benchmark for achieving the objectives. (Discussions with specialists to examine possible improvements in existing plan)

5. Preparation of various alternative plans within the existing level of resources under the guidance of specialists or scientists and selecting the most suitable one.
6. Developing a means of evaluating progress and readjusting one's sights as the planning process moves along.

TYPES OF PLANS or HIRARCHY OF PLANS:

It is very easy to see that a major programme, such as to build and equip a new factory, is a plan. But what is sometimes overlooked is that a number of other courses of future action are also plans. So a plan encompasses any course of future action, we can see that plans are varied. They are classified as Purposes or mission, objectives, strategies, policies, procedures, rules, programmes, and budgets.

Purposes or Missions:

Every kind of organization should have a purpose of establishment or mission. Generally many organizations may have a social purpose of producing and distribution of economic goods and services, it may accomplish this by fulfilling a mission of producing certain lines of products. The mission of Reliance Oil Company is to search, produce, refine, market and producing wide variety of petroleum products.

Every kind of enterprise in the society should know who its customers are and what they expect. It is some times thought that the mission of a business, as well as objective is to make profit, to survive and do the task society entrusted to it. But this basic objective is accomplished by undertaking activities, going in clear directions, achieving goals and accomplishing a mission.

Objectives or Goals:

The planning process starts with setting of objectives. Objectives or goals are the ends towards which the activity is aimed at. Objectives are the statements developed by the top management, board of directors, and chief executives to define what they believe to be the organizations mission. These are the shining stars that provide light to the path of subsequent planning and thinking. They are the targets towards which goals are aimed.

The enterprise objectives constitute the basic plan of the firm, while the departmental objectives are attained through fulfilling the assigned goal. For example Philips Company's objective is to make certain profit by producing a given line of production of music systems, while the goal of the manufacturing department might be to produce the required number of said systems.

These also the most neglected of all the planning segments. This neglect occurs because managers either avoid the mental exercise needed to set objectives or fear the failure that might be evidenced by an inability to reach them.

Management has multiple objectives which are inter-related. Objectives mean short term goals in a business firm. Depending on the period of action objectives are classified as

- (i) Short range objectives, which are to be fulfilled immediately within a short period.

- (ii) *Long range objectives, which are also known as goals.* They can be terminated at a certain point in the long run or they can be continued depending up on the situation.

The objectives enable the managers to plan, organize, direct and control the business and other resources in proper direction. They also help in efficient utilization of resources in a business.

Nothing is important to the long-range success of an agribusiness as written, well-thought- out objectives. Quite simply, an organization that knows where it is going is much likely to get there than one that depends on arriving by accident.

Well stated objectives should:

1. Record the direction the agribusiness should take.
2. Provide guides for the goals and results of each unit or person.
3. Allow appraisal of the results contributed by each unit or person.
4. Contribute to a successful overall organizational performance.
5. Indicate the philosophy and desired image of the organization.

Objectives should be broad, long-range, flexible, and not necessarily time-oriented. Most agribusiness will have at least five objectives, and a few might have ten or more. An organization with more than ten overall objectives is almost certainly mixing goals with its objectives.

Objectives are usually found on the following business areas:

1. Market standing (position compared with competitors)
2. Growth and development (how much and fast should growth be?)
3. Profitability (what kinds and amounts of profits are feasible?)
4. Employee relations and performance (What rewards and share of income should go to employees, and what is expected of them?)
5. Investor relations and return (What portion of earnings should go to investors?)
6. Public responsibility and relationships (What kind of business citizen does the company want to be?)
7. Physical resources (What plant equipment, tools, etc., are needed?)
8. Products and innovation (What emphasis will be placed on new products and research?)

Strategies:

Strategies denote a general programme of action and an implied deployment of emphasis and resources to attain comprehensive objectives. According to Chandler, the Strategy is “the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary to carry out these goals”. Ex: Nano car from TATA is a strategy to capture the market of adjacent countries as well as to pose competition to the native manufacturers.

Policies:

Policies are used to guide one's thinking process during the planning or decision-making stage. The formulation of policies allows everyone to consistently make decisions that are in line with organizational objectives. The policy sets boundaries within which an agribusiness employee can exert individual creativity. For example, one business unit instituted a policy that the general manager must approve all purchases compulsorily that totaled Rs. 500 or more. The purpose of such a policy was to protect the business against unexpected large cash drain.

Policies are not the objectives, although they are closely tied to objectives. Because they are not the objectives, policies should never be used to fence in managers as they make decisions about long-range, complex problem situations.

Procedure:

A procedure is a step-by-step guide to a specific activity or function. In many cases, there is a definite need to set out just such a precise course of action. A procedure should not, in most cases, be applied to complex tasks of a long-range nature. If the business firm sought to implement its new purchasing policy, the procedure involved called for an employee to fill out a requisition form, submit it to the general manager for approval, then send it to the purchasing director. Procedures work best when they are applied to routine and recurring tasks of a relatively simple nature that require control.

Both policies and procedures are of tremendous value to the new employee who is learning on the job, majorly to prevent unauthorized actions.

Practices:

Practices represent what is actually done in the agribusiness, and they may conflict with policies and procedures. Managers have to be sure that policies make sense, are relevant, and are enforced, in order for them to become widespread practices.

A course of action that is established on a recurring basis becomes a practice, often by tradition or habit more than anything else. The status of practices can become as important as that of either policies or procedures, and even more difficult to change, so the agribusiness manager must see to it that practices coincide with policies and procedures. For instance some agribusiness company is practice to give sweets on Dewali to their employees, some follow a policy of sharing a portion of profits with their employees.

Rules:

Rules are frequently confused with the policies and procedures. A rule is that it reflects a managerial decision that certain action be taken or not be taken. A rule requires that a specific and definite action be taken or not taken with respect to a situation. As a matter of fact, a procedure could be looked up on as a sequence of rules.

Programmes:

Programmes are a complex of goals, policies, rules, task assignments, steps to be taken, resources to be employed, and other elements necessary to carry out a given course of action and are ordinarily supported by the necessary capital and operating budgets. Designing programme therefore truly requires the most rigorous application of systems thinking and action.

Budget:

It is a plan of statement of expected results expressed in numerical terms. It may be referred as a “numberised programme”. The financial operating budget is called as a profit plan and may be expressed in terms of labopur-hours, units of products, machine-hours,etc.,

It is a fundamental planning instrument in many companies because it forces a degree of definiteness in planning.

Lecture No. 5

Organising – Meaning – purpose – Staffing – Definition – Staffing *Process*.

ORGANISATION:

Meaning: In any business activity there is always a person who guides and controls its functions. He also co-ordinates and regulates all the factors which are employed in the business activity. Apart from monitoring it, he takes the responsibility of the outcome. We call such a person an entrepreneur (organizer) and the business activity which he is doing is called an enterprise or organization.

If management is seen as a body of knowledge, then the organization is *skeleton or framework* on which the management is built.

Barnard referred to an organization as the activities of two or more persons were concisely coordinated towards a given objective. An organization structure is effective if it facilitates the contribution of individuals in the attainment of enterprise objectives.

Purpose:

The purpose of organization in an enterprise involves

1. The process of identification, classification and grouping up of required activities
2. Grouping of activities in light of resources and situations
3. Assigning these activities to positions
4. Delegation of the authority to different persons and
5. Horizontal and vertical co-ordination of the authority and information relationships to enable them to carryout these activities very effectively and efficiently towards achieving the objectives.

Organization brings co-operation, harmony and integrity among the people.

As a part of the organization function, the agribusiness manager must see that each employee has a role that is clearly defined. The employees' work goals, the decision to place some one in charge, and the overall goals of the organization, coupled with the ways in which each person and department relate to each other, comprise the organizational plan. Such a plan allows management to establish accountability for the results achieved; it prevents buck passing and confusion as to who is responsible; and it details the nature and degree of authority that is given to each person as the activities of the firm are accomplished.

The process of organization starts with staffing and recruitment of persons.

Functions of organizer:

1. To determine the jobs to be done by the staff (job description, selecting, allocating & training personnel)
2. Defining the line of activities of the staff.

3. Establishment of relationship among the staff.
4. Selecting and training of personnel in organization.

Staffing: (Human Resource Management)

It is defined as the process of filling the positions in an organization structure through identifying work-force requirements, inventorying the people available, recruitment, selection, placement, promotion, appraisal, compensation and training of needed people to carry out the business activities very effectively.

Staffing should be based on the need of the enterprise operation and day to day running of the business with out any sort of hindrance. On the basis of the need, Managers should determine the number and type of persons to be staffed in the enterprise.

The manager of the firm should develop a strategic staffing plan in such a way that the working by all in a collective way without the feeling of overwork. The staffing plan with specification of the positions / jobs should always thrive to fulfill the set objectives of the firm.

Once the staffing plan is prepared, the duty of the manager is to develop the job description (i.e. the work should be performed by the specific position) in a constructive way so that the qualified people should think that they should not leave the opportunity of working with that enterprise.

Organization and staffing go side by side. Staffing starts with recruitment of personnel. Recruitment starts with specification or qualifications of individual who will occupy important positions to carry out the activities of organization.

There are different ways of recruiting the staff.

1. Advertising in news papers
2. Recruiting through persons who are already working in the organization
3. Recruiting through friends
4. Considering the persons who knock at the doors of organization, etc.

Selection Process:

1. The performance of choosen person on the job is the best criterion.
2. The application of the firm is usually carries information pertaining to personal data of applicant and his educational background, training he has undergone, work experience if any, salary history, special interest of individual if any etc.,
3. An interview will be conducted through which mental alertness, sense of values, quickness of judging, general orientation, communication skills, degree of professionalism etc., of the applicant will be studied. Besides such mental ability of the individual, language efficiency of persons is also studied.
4. The applicant's academic record usually serves a major indicator for selection process.
5. In highly specialized jobs, the academic record is the best criteria.
6. In the case of managerial positions along with academic record and leadership qualities communication skills assume greater significance.

7. The reference letters submitted by the applicant are of some use, but some managers do not give much importance to such reference letters because applicant submits such letters which are with favourable comment from previous organization.
8. Examination of physical fitness of individual is most common in any organization because no organization will ready to recruit a sick person.
9. Good organizer selects the person with fairly above average academic record with extracurricular activities which give rise to a good leadership.

Lecture No. 6 & 7

Directing – Motivation – Ordering – Leading – Supervision – Communication and control – Meaning and definitions.

DIRECTION:

Direction is nothing but motivating, ordering, guiding, leading, executing and supervising the organization. It is an important management function making the people engaged in various positions to move towards the achievement of goals and objectives.

Managers as directors know that the successful measure of the output / profits is due to sum of the performance or work output of all those who work under their control in the firm. Such managers recognize that no one or some one in the firm is completely satisfied. It is also true that all employees can not be happy all the time. The good manager would always have good qualities of directing and building leadership that could help his staff to succeed in their work and derive job satisfaction in their work. Good directors always change their styles to bring about the desired changes.

He identifies the skills of the workers in the firm and assigns such job to execute. The

function of directing is compared to HEART of body of management.

The direction function of management has the following works:

1. Assigning duties and responsibilities to personnel.
2. Establishing the results to be achieved.
3. Delegating the necessary authority
4. Creating a desire for success.
5. Supervising that the job is done properly by workers.

Orders:

Orders or instructions are the vehicles for messages with proper direction from top to bottom of an organization.

Features of orders:

1. Orders should be very clear and understandable
2. Generally orders are unidirectional and moves from top to bottom operating units
3. The timing of orders is crucial i.e. they must be issued when needed and should reach the grass root level workers in time.
4. To have a check whether the orders are converted into action, a feed back report should be the source of orders
5. Orders vary in form and details depending up on the degree of delegation practiced in the organization. Some of them are negative, which prohibit certain actions, whereas some orders are positive, prescribing the course of action towards the attainment of objectives.

A firm should be conditioned for effective direction. The manner in which it is organized could facilitate conditioning. Often, it is necessary to keep persons in the organization, both as individuals and as groups motivated for proper direction. The workers must also find meaning and purpose in the orders and in implementing the orders.

Motivation:

The goal seeking behavior or goal directing behavior of individual is called as motivation.

All the personnel in the organization should be reoriented towards achieving the objectives. But this is not an easy task.

Certain motivational devices are usually followed to make the direction effective such as rewards for better work, time bound promotions and better working conditions. Any way these are not the standard devices and vary from situation to situation.

The organizer in firm has to motivate his staff towards better utilization of resources and move the things in right direction towards accomplishment of goals and objectives.

Leadership:

The function of direction may also be described in broader terms as the task of making the organization take on life, of creating the conditions that make for interest in the the job, vigour of action, imaginative thinking and continuous team work. This goal is one that cannot be reached by magic formulae. Its achievement rests in large measure, up on the qualities of leadership exhibited by the manager.

Leadership is helping individuals or groups to accomplish organizational goals. It is also, perhaps paradoxically, the process by which the manger attempts to unleash each persons individual potential, once again, as a contribution towards organizational success. Leaders recognize the result of a person's activities counts for more than the activities themselves.

Successful managers must have a leadership style and capability that allows them to modify their management patterns to fit the changing times.

The changes in the management pattern are observed as below in the recent times according to the dynamic working conditions in the business.

<u>YEASTERDAY</u>		<u>TODAY</u>
Strong leadership	—————→	Group leadership
Arbitrary rewards	—————→	Planned rewards
No participation	—————→	Meaningful participation
Absolute power	—————→	Diluted power
Rigid organization	—————→	Flexible organization
Thing oriented	—————→	People oriented

A good manager today must help subordinates to find satisfaction and to identify themselves with their jobs and with the organization. At the same time, a sense of balance is required. Managers must recognize the usefulness of human behavioral principles; but they must also recognize that there are other objectives in running a business besides having happy, satisfied employees.

Successful agribusiness managers know that the output is some total of the outputs of all those who work for them. Such managers recognize that no one is ever completely satisfied with any organization, and probably some will never be satisfied at all. What satisfies one person will not satisfy other. But the manager as a director will see that most of the people should be happy most of the time with satisfactions that they derive from their work. The good agribusiness manager will develop those qualities of direction and leadership that will help subordinates to succeed and to derive satisfaction from their work.

CO-ORDINATION:

Co-ordination is unifying and synchronizing action of group of people in the firm. It is considered as the BRAIN in the body of management skills.

Sound, good and command of management skills will keep the need for coordinating function at a minimum level. The good manager would always strive to co-ordinate operations, departments and individuals under their control and properly work for their integration to achieve the desired results.

➡ In general coordination means working together by

1. Interpreting the programmes, plans, policies, proceeds and practices.
2. Providing for growth and development of employees.
3. Keeping in touch with the employees.
4. Conditioning the firm for its success.
5. Providing the free flow of information.

The manager must work hard for welfare of the employees. Efficient workers must be rewarded & promotion policies should be designed. Bonus distribution should be timely and adequate. Accommodation, transport, medical and education allowances, training facilities should be provided.

The good manager should identify the hidden talents of personnel by stimulating them through varied assignments that offer continuously increasing challenges and opportunities. He should have regular schedule of contacts with his staff. He should set himself as a good example to others.

A good coordinator continuously and carefully seeks the participation of workers. His actions should always be result oriented. He should inspire confidence and motivate the staff with his skills.

Work climate: Without a proper working climate, none of the skills and principles of management can flower and bear fruits

Six Principles of creating the climate:

1. Set a good example himself by the manager
2. Conscientiously seek participation
3. Be goals-and results- oriented
4. Give credit (in public) and blame (in private) as needed
5. Be fair, consistent and honest
6. Inspire confidence and lend encouragement.

Good managers know how to use these principles to create a productive working climate.

Communication:

The key to the success of any of the management functions is the free flow of communication. The agribusiness manager is responsible for designing and implementing the communications process.

Free flow of information means that communications must flow not only downward (from management to subordinates), but upward (from subordinates to managers) and laterally (at the same level) to be effective. Too often managers depend almost exclusively on downward communications and then wonder why policies, procedures, and goals are misunderstood. Successful communications require feed back. Feed back allows the managers to see whether understanding has indeed occurred. It also allows the good ideas and potential contributions of each employee to be part of the success mix of collective wisdom and knowledge found in the organization. The manager must provide the opportunity for this feed back and involvement through a carefully designed communication process involving comities, meetings, memos and individual contacts.

No matter how well thought out the organizational structure is, there will be times when it breaks down. In such a situation the complex operations that do not always work way that they are laid out on the paper. People have emotions, misunderstandings and ego needs that sometimes get in the way, especially during seasonal peaks of hectic activity, when they get physically and emotionally tired. Effective management recognizes the need for interpreting the formal structure in terms of the human element, by adjusting and working through misunderstandings when they occur. No organizational structure can be successful without a constant concern about honest but tactful communication at all levels.

CONTROL:

Control function is complementary to other management functions and considered as NERVOUS SYSTEM of body of knowledge that reports the function of the parts of the body to the whole system. It measures the deviations from the desired course of action and thereby suggests for desired direction.

Definition: Controlling is the process of influencing the performance or executing the supervision, so that the results of organizational efforts will reach the expectations.

Massie stated four essential elements of control as follows:

- ✓ A pre-determined criterion / goal / benchmark.
- ✓ A means of measuring current activity quantitatively, if possible.
- ✓ A means of comparing current activity with a prefixed criterion.

- ✓ Some means or measures of correcting current activity to achieve desired criterion / goal.

Control does not mean restriction of power over subordinates. Control system sounds a warning when necessary for taking up remedies for problems. Workers in general make mistakes, so the plans finally could not be executed according to schedule. Then there will be great need for having control system to set right the things. Through proper controlling, managers would become aware of weak spots in organizational, directional and co-ordinating efforts and operations of the business.

Another important purpose is to evaluate the progress being made towards organizational goals. In the absence of control system employees can not respect the programmes, disregard and in-accuracy are likely to result. The control programmes should be checked periodically and reviewed so that the irrelevant control programmes can be dropped.

To be successful, the agribusiness manager must apply this functional knowledge and ability to each of four basic areas of agribusiness viz., financial management and planning, marketing and selling, production and operations, and personal and human dimension.

Lecture No. 8

Capital – Meaning – Working capital – Gross working capital – Net working capital – Permanent working capital- Temporary working capital- Balance sheet working capital – Cash working capital.

CAPITAL MANAGEMENT IN AGRI-BUSSINESS:

Capital is not an original factor like land, but it is the result of man-made efforts.

Man makes the capital goods to produce other goods and services, which provides income. Ex:

Machinery, raw material, transport equipment, dams etc.,

- ✓ „Capital is produced means of production“
- ✓ Karl Marx in his book “*Das Kapital*” defined “capital is crystallized labour”.

All capital is necessarily wealth, but all wealth is not necessarily capital. Money if used for the purchase of capital goods, then only it becomes capital.

Ex: Residential buildings are the wealth of the individuals, but these are not considered as capital. But earning the rent from that building is capital.

Characteristics of Capital:

1. Capital is not a free gift of nature. It is the resultant of the man-made efforts.
2. Capital is productive, as it helps in enhancing the over all productivity of all the resources employed in the production process. Invested capital provides interest for its productive capacity. Farm machinery, when used with skilled labourers enhances the productivity of land. Irrigation dam, by providing water can bring out complementary effect on the productivity of other resources like fertilizers, seeds etc.,
3. Capital is prospective, as its accumulation reward income in future.
Ex: Savings and investment in the economy leads to growth and development of the economy due to accumulation of capital over time.
4. Capital is highly mobile among factors of production. Ex:
Tractor
5. Capital is supply elastic, as its supply can be altered according to the need. Based on demand, supply of the capital goods can be changed.

Economists speak of capital as wealth which is used in the production of additional wealth. Business men frequently use the word capital in the sense of the total assets employed in a business. In law, capital usually means capital stock. A financial manager determines the proper capital structure for his firm. *He determines the mix of debt and equity stock*. The balancing of the capital expenditures against estimated savings in future requires careful analysis while dealing with the financial aspects of the company's operations. A careful balancing of facilities at each stage of the productive process is necessary to avoid higher operating costs and delay caused by facility bottlenecks and the freezing of capital in idle equipment.

Long range planning for the capital management / expenditures is essential due to the following reasons:

1. It helps in fitting yearly corporate expansion on orderly plan of growth by adopting capital expenditures to anticipated sales requirements.
2. It assists in testing the profitability of capital expenditure over a period of time as against in the next following year.
3. It facilitates in contracting for plant sites, construction, water or power requirements etc., in advance.
4. Aids to assess the necessary funds provided by internal or external sources.
5. Assist in examining the impact of capital expenditures on depreciation, insurance expenses and other fixed expenses in advance in order to make the necessary allowance for them.

Working capital:

It is regarded as the *life blood of a business*, because its efficient management will lead to success of business and its inefficient management will lead to failure of the business.

Definitions:

- ✓ Working capital can be defined as that portion of the assets in a business which are used to meet the day to day / current operations of the business.
- ✓ The assets formed due to the working capital are relatively temporary in nature.
- ✓ In accounting, working capital is defined as difference between inflow and out flow of funds. It is otherwise called as net cash flow per year.

$$\text{Net cash flow / Yr} = \text{Cash in-flow} - \text{Cash out-flow}.$$

- ✓ Working capital is the excess of current assets over current liabilities of a business. It is otherwise called as net current assets or net working capital / year.

$$\text{Net working capital per year} = \text{Current assets} - \text{Current liabilities}$$

- ✓ Working capital may also be defined as total current assets employed before operating the business. It is also called gross working capital.
- ✓ Working capital is also called as circulating capital. At the beginning cash is provided by owners and lenders. A part of capital is invested on the fixed assets and the remaining cash is used to meet the current requirements like purchase of services, raw material or merchandise. By selling the products from the enterprise, cash will be received, which is used for the expansion of the business. This process indicates the circular flow of working capital, so named as circulating capital.

Types of working capital:

1. Net working capital: Net working capital is the difference between the current assets and current liabilities of a business. This concept enables a firm to determine how much is left for operational requirements.

$$\text{Net working capital per year} = \text{Current assets} - \text{Current liabilities}$$

2. Gross working capital: It is the total amount of the funds invested in the business or the total current assets employed in the business. It helps to plan and control the funds usage in the business and also helps in identifying the prioritized areas of investment.

3. Permanent working capital: This is the minimum amount of current assets which is needed to conduct a business even during the dull / slack season of the year. It is the amount of the funds required to produce the goods and services which are necessary to satisfy demand at a particular point. It represents the current assets which are required on a continuous basis over the entire year. It is maintained as the medium to carry on operations at any time.

4. Temporary working capital: It represents the additional assets which are required at different times during the operating year like additional inventory, extra cash etc.,

5. Balance sheet working capital: The working capital that is calculated from the items appear in the balance sheet is called balance sheet working capital. Ex: Gross working capital and Net working capital.

6. Cash working capital: This will be calculated from the items appear in profit & loss account. It will show the real flow of money at a particular point of time and hence it is considered as *most realistic approach in working capital management*. It forms the basis for operational cycle concept and gained more important in the financial management. The major reason is that cash working capital indicates the adequacy of the cash flow in the business, hence considered as prerequisite of the business.

7. Negative working capital: It arises when current liabilities are more than current assets. Such situation arises when firm is nearing a crisis of some magnitude.

Tests of working capital policy:

There are four tests of working capital policy.

1. Level of working capital: It is the test to be done in a careful manner by observing the movements of working capital in a firm in successive periods of production activity. If a management can develop a pattern of flow of working capital in these movements, this pattern would serve as a guide to its changing requirements in relation to certain decisions which are made from time to time.
2. Structural Health: The relative health of the various components of the working capital should be considered from the point of view of liquidity. It is necessary to draw structural relationships in respect of each component constituting the current assets.
3. Circulation: This is one of the important features of the liquid position and involves the natural activity cycle of an enterprise. Ratios may be calculated to show the average period required for the conversion of raw materials into finished goods into sales, and sales into cash.
4. Liquidity: A more comprehensive test to measure liquidity may be adopted by using the following ratios by expressing them in the percentages of
 - a. Working capital to current assets.
 - b. Stocks to current assets.
 - c. Liquid resources to current assets.

Lecture No.9

Financial management-importance of financial statements-balance sheet-profit and loss statement

Financial analysis is one of the roots of management used to carry out its controlling function. Proper interpretation of data presented by the financial statement helps in judging the profitability of operations during given time periods, in determining the soundness of financial condition at a specific date, in determining future potential to meet existing or anticipated credit obligations and in developing performance trends to be used as a basis for future decision making.

At regular period public companies must prepare documents called financial statements. Financial statements show the financial performance of a company. They are used for both internal and external purposes. When they are used internally, the management and sometimes the employees use it for their own information. Managers use it to plan ahead and set goals for upcoming periods. When they use the financial statements that were published, the management can compare them with their internally used financial statements. They can also use their own and other enterprises' financial statements for comparison with macroeconomical data and forecasts, as well as to the market and industry in which they operate in.

The term financial statement refers to two basic statements that an accountant prepares at the end of a specified period of time for a business enterprise.

1. Balance sheet: It is a statement of financial position of a firm at a particular point of time.
2. Income statement: It is also called profit-loss statement. It shows firm's earnings for the period covered, usually half yearly or yearly.

Balance Sheet

From an analyst point of view, it is a written representation of resources and liabilities of the business firm. It shows the financial condition of the business firm at a given date (particular point of time). The balance sheet contains information on assets, liabilities and net worth of a firm. Assets must always equal the sum of liabilities and net worth. What is owned by or owed to firm (assets) must equal what the firm owes to its creditors plus what is owed to its owners (net worth). Balance sheet indicates the sources from which business obtained capital for its operations and the form in which that capital is invested on a specific date. Net worth represents owner's equity in the business.

Assets: Assets include anything that the company actually owns and has disposal over. Examples of the assets of a company are its cash, lands, buildings, and real estates, equipment, machinery, furniture, patents and trademarks, and money owed by certain individuals or/and other businesses to the particular company. Assets that are owed to the company are referred to as accounts-, or notes receivables.

1. Current Assets include anything that companies can quickly monetize. Such current assets include cash, government securities, marketable securities, accounts receivable, notes receivable, inventories, prepaid expenses, and any other item that could be converted into cash within one year in the normal course of business.
2. Fixed Assets are long-term investments of the company, such as land, plant, equipment, machinery, leasehold improvements, furniture, fixtures, and any other items with an expected useful business life usually measured in a number of years or decades. Fixed assets are usually accounted as expensed up on their purchase. They are normally not for resale and are recorded in the Balance Sheet at their net cost less accumulated depreciation.
3. Other Assets include any intangible assets, such as patents, copyrights, other intellectual property, royalties, exclusive contracts, and notes receivable from officers and employees.

Liabilities: Liabilities are money or goods acquired from individuals, and/or other corporate entities. Some examples of liabilities would be loans, sale of property, or services to the company on credit. Creditors (those that loan to the company) do not receive ownership in the business, only a (usually written) promise that their loans will be paid back according to the term agreed upon.

1. Current Liabilities are accounts, and notes, taxes payable to financial institutions, accrued expenses (eg.: wages, salaries), current payment (due within one year) of long-term debts, and other obligations to creditors due within one year.
2. Long-Term Liabilities are mortgages, intermediate and long-term loans, equipment loans, and other payment obligations due to a creditor of the company. Long-term liabilities are due to be paid in more than one year.

Shareholder's equity (or net worth, or capital)

The shareholder's equity is money or other forms of assets invested into the business by the owner, or owners, to acquire assets and to start the business. Any net profits that are not paid out in the form of dividends to the owner, or owners, are also added to the shareholder's equity. Losses during the operation of the business are subtracted from the shareholder's equity.

Assets are calculated the following way:

$$\text{Assets} = \text{Liabilities} + \text{Net worth}$$

All balance sheets contain the same categories of assets, liabilities and net worth figures. Assets are arranged in decreasing order of their liquidity. Liabilities are listed in the order of how soon they must be repaid, followed by retained earnings (net worth of owner's equity).

The categories and formats of balance sheets are established by a system known as Generally Accepted Accounting Principles (GAAP).

Limitation: It is an interim statement between two operating periods. It summarizes solvency of business at a given time rather than financial transactions occurred in business during an accounting period.

Example: Balance sheet of Mango pulp industry Entrepreneur as on 1.1.2010

Assets		Liabilities	
	Rs.		Rs.
Current assets		Current liabilities	
Cash in the bank	50000	Accounts payable	150000
Cash in the hand	10000	Promissory notes payable	30000
Prepaid expenses	70000	Taxes payable	25000
Inventory	300000	Wages payable	100000
Others	75000	Interest payable	50000
		Dividends payable	25000
Total current assets	505000	Total current liabilities	380000
Long term assets		Long term liabilities	
Land	1500000	Mortgage loan	300000
Buildings	800000	Other loans	2000000
Less depreciation @ 5%	-40000	Total long term liabilities	2300000
Equipments	1000000		
Less depreciation @ 5%	-50000	Total liabilities	2680000
Other assets	300000		
Less depreciation @ 5%	-15000	Networth	1320000
Total long term assets	3495000		
Total assets	4000000	Total liabilities and networth	4000000

Income Statement

It is also called profit and loss statement. It states the source of firm's incomes, describes the nature of the expenses, and shows the net profit earned (or net loss incurred) during an accounting period. It is supporting evidence to balance sheet, in the sense, that it explains the change in retained earnings on the balance sheet.

Income statements show the results of operating during those accounting periods. They are also prepared using the Generally Accepted Accounting Principles (GAAP) and contain specific revenue and expense categories regardless of the nature of the company.

The format of a profit & loss statement varies from business to business but such statement generally begins with sales and subtracts the appropriate expenses with profit showing as a remainder.

Sales: It represents the monetary value of all products and services that have been sold during a specified period.

Cost of goods sold: We can define cost of goods sold as the cost of opening stock of goods plus cost of purchases minus cost of closing stock.

In the case of manufacturing firm, cost of goods sold will include manufacturing costs such as raw material consumed, wages & salaries, power & fuel, repairs & maintenance, consumables, etc.

Operating expenses: Expenses relating to the main operation / business of the firm are called operating expenses.

Examples include manufacturing expenses such as raw material, wages and salaries, power and fuel, depreciation, director's fees, management salary, office expenses, travel expenses, selling and distribution expenses such as wages, salaries, commission, transportation, advertising and promotion.

Non-operating expenses: Expenses which are incidental / indirect for main operations of firm called non-operating expenses. Expenses incurred in generating non-operating revenues are classified in this category.

Operating revenue: Revenue arising from the main operations or business of the firm are called operating revenue. Ex: Gross proceeds from the sale of products, manufactured by a firm are operating revenue.

Non-operating revenue: Revenues which are incidental or indirect to main operations of firms are non-operating revenue. Ex: Gross proceeds from sale of an old equipment, dividends, interest, income from temporary investment, etc.

Concept of profit: The difference between revenue (sales) and cost of goods sold is called gross profit. When we deduct all other expenses including interest and taxes from gross profit we obtain profit after taxes and net profit.

Uses of Income Statement

1. Can determine what profit is earned by the business.
2. Can find particular causes of low profit or operating losses.
3. Management can take action to prevent the occurrences of future losses or to prevent further decline in profits.

Example: Profit and loss statement of a hypothetical fertilizer company year ending Dec 31, 2009

(Rs. in lakhs)

I. Sales	90
II. Cost of goods sold	40

III. Gross margin (I-II)	50
IV. Operating expenses	
1. Salaries and wages	5
2. Local taxes, licenses	3
3. Insurance	1
4. Depreciation	7
5. Rent and lease	2
6. Advertising and sales promotion	3
7. Office expenses	1
8. Maintenance and repairs	0.5
Total operating expenses (1+2+3+4+5+6+7+8)	22.5
V. Net operating profit (III-IV)	27.5
VI. Interest expenses	2.75
VII. Other non-operating income	5
VIII. Net profit before taxes (V-VI+VII)	29.75
IX. Profit taxes @ 30%	8.93
X. Net profit after taxes (VIII-IX)	20.82

Lecture No. 10 & 11

Analysis of financial statements-liquidity ratios-leverage ratios-Coverage ratios-turnover ratios-profitability ratios

Ratio analysis is a powerful tool of financial analysis. A ratio is defined as the indicated quotient of two mathematical expressions and as the relationship between two or more things.

In financial analysis, a ratio is used as bench mark for evaluating the financial position and performance of a firm. Ratio analysis will explain what strength, weakness, pressures and forces are currently at work in your business operation. Farm business managers will need a full time job accountant for the change accruing in his capital structure and net worth as revealed in his balance sheet.

Ratio analysis of properly calculated rates can be readily compared with

1. firm's past ratio in order to show trends
2. ratio of other firms of similar size, large size or of smaller size with which the manager is familiar
3. industrial standards
4. projected goals as reflected in plans for the future.

Fundamental difference between ratio analysis and trend is that the ratio analysis measures the movement in absolute terms whereas the trend indicates the relationship. The marginal analysis is used in determining the most profitable combination of resources and products. It is concerned with last added or marginal unit of input and product.

Ratio analysis has the following advantages

1. Has no units
2. Compares numerator with respect to denominator
3. Relative and comparable

The following are the five important categories of ratios.

1. Liquidity ratios
2. Leverage ratios
3. Coverage ratios
4. Turnover ratios and
5. Profitability ratios

Liquidity ratios

Liquidity ratios measure the ability of the firm to meet its current obligations.

1. **Current Ratio (CR)**: It is calculated by dividing current assets by current liabilities.

$$\text{Current ratio} = \text{Current assets} \div \text{Current liabilities}$$

Current assets include cash, marketable securities, debtors, inventories, prepaid expenses. All those assets which can be converted into cash within a year are included in current assets.

Current liabilities include creditors, bills payable, accrued expenses, short term bank loans, income tax liability, long term debt maturing in current year, etc. All obligations maturing within a year are included in current liabilities.

Current ratio is a measure of the firm's short term solvency. It indicates the availability of current assets in rupees for every one rupee of current liability. A ratio of greater than one indicates that the firm has more current assets than current claims against them.

2. **Quick ratio**: The ratio establishes a relationship between quick or liquid assets and current liabilities.

$$\text{Quick ratio} = (\text{Current assets} - \text{inventories}) \div \text{current liabilities}$$

(or)

$$\text{Acid or quick ratio} = (\text{Cash} + \text{marketable securities} + \text{accounts receivable}) \div \text{current liabilities}$$

3. **Cash ratio**: Since the cash is the most liquid asset, a financial analyst may examine the ratio of cash and is equivalent to current liabilities. Marketable securities are equivalent cash.

$$\text{Cash ratio} = (\text{Cash} + \text{marketable securities}) \div \text{current liabilities}$$

4. **Net working capital ratio**: The difference between current assets and current liabilities excluding short term borrowings is called net working capital (NWC) or net current assets.

$$\text{NWC ratio} = \text{Net working capital} \div \text{Net assets}$$

Leverage Ratios

These ratios may be calculated from the balance sheet items to determine the proportion of debt in total financing.

1. **Debt-equity ratio**: The relationship describing the lender's contribution for each rupee of the owner's contribution is called debt-equity ratio.

$$\text{Debt-equity ratio} = \text{Total debts} \div \text{Net worth}$$

2. **Total debt ratio**: In order to know the proportion of the interest-bearing debt (also called funded debt) in the capital structure, debt ratio is computed

Debt ratio = Total debts ÷ (Total debt + Net worth)

Total debt will include short and long term borrowings from financial institutions, debentures / bonds, deferred payment arrangements for buying capital equipment and bank borrowing, public deposits and any other interest bearing loan. Capital employed will include total debt and net worth.

Coverage ratios

The interest coverage ratio is one of the most conventional coverage ratio used to test the firm's debt servicing capacity.

Interest coverage ratio = Earnings before interest and taxes (EBIT) ÷ Interest

The interest coverage ratio shows the number of times the interest charges are covered by funds that are available for their payment. Since taxes are computed after interest, interest coverage is calculated in relation to before tax earnings. Depreciation is a non cash item. Therefore, funds equal to depreciation are also available to pay interest charges. We can calculate the interest coverage ratio as earnings before depreciation, interest and taxes (EBDIT) divided by interest.

Interest coverage ratio = EBDIT ÷ Interest

Activity ratios (or) Turnover ratios

These ratios are employed to evaluate the efficiency with which the firm manages and utilizes the assets. They also indicate the speed with which assets are being converted or turned over into sales. Thus activity ratios involve a relationship between sales and assets.

1. Inventory turnover: The ratio indicates the efficiency of the firm in selling its product.

Inventory turnover = Cost of goods sold ÷ Average inventory

The average inventory is the average of opening and closing balance of inventory. In manufacturing company inventory of finished goods is used to calculate inventory turnover.

Inventory turnover can also be calculated by dividing sales with inventory.

The inventory turnover shows how rapidly the inventory is turning into receivable through sales. High inventory turnover is indicative of good inventory management. A low

inventory turnover implies excessive inventory levels than warranted by production and sales activities or slow moving inventory.

- 2. Debtors turnover:** A firm sells goods for credit or cash. Credit is used as a marketing tool. When the firm extends credit to its customers, book debts (debtors or receivable) are created in the firm's records. Book debts are expected to be converted into cash over a short period and therefore included in current assets.

$$\text{Debtors turnover} = \text{Sales} \div \text{Debtors}$$

Profitability ratios

Profit is the difference between revenue and expenses over a period of time. Profit is the ultimate output of a company and it will have no future if it fails to make sufficient profit. The profitability ratios are calculated to measure the operating efficiency of the company.

- 1. Gross profit margin:** The gross profit margin reflects the efficiency with which management produces each unit of product. A high gross profit margin is a sign of good management. A low ratio reflects higher cost of goods sold due to firm's inability to purchase raw materials at favourable terms, inefficient use of fixed and variable resources.

$$\begin{aligned} \text{Gross profit margin} &= (\text{Sales} - \text{cost of goods sold}) \div \text{Sales} \\ &= \text{Gross profit} \div \text{Sales} \end{aligned}$$

- 2. Net profit margin:** Net profit margin is obtained when operating expenses, interest and taxes are subtracted from the gross profit. The net profit margin indicates management's efficiency in manufacturing, administering and selling the products. This ratio is the overall measure of the firm's ability to turn each rupee sales into profit. It also indicates the firm's capacity to withstand adverse economic conditions.

$$\text{Net profit margin} = \text{Profit after tax} \div \text{Sales}$$

- 3. Operating expense ratio (OER):** It explains the changes in the profit margin (EBIT to sales) ratio. The ratio is computed by dividing operating expenses viz., cost of goods sold plus selling expenses and general administrative expenses (excluding interest) by sales.

$$\text{Operating expenses ratio} = \text{Operating expenses} \div \text{Sales}$$

A higher operating expenses ratio is unfavourable since it will leave small amount of operating income to meet interest, dividends, etc.

- 4 Return on investment (ROI): The term investment may refer to total assets or net assets. The funds employed in net assets are known as capital employed. Net assets equal fixed assets plus current assets minus current liabilities excluding bank loans. Alternatively capital employed is equal to networth plus total debt.

Return on investment (ROI) = Return on total assets (ROTA) = $\text{EBIT(IT)} \div \text{Total assets}$
Return on investment (ROI) = Return on net assets (RONA) = $\text{EBIT(IT)} \div \text{Net assets}$

- 5 Return on equity (ROE): This ratio indicates how well the firm has used the resources of owners. It reflects the extent to which the objective of earning a satisfactory return has been accomplished.

Return on equity = $\text{Profit after tax} \div \text{Net worth}$

Lecture no.12 &13

Agro-based industries-importance-need-institutional arrangements for the promotion of agro-based industries-Procedure to be followed to set up agro-based industries –constraints in establishing agro-based industries

Importance

- Establishment of agro-based industries is based on the availability of raw material.
- Agro-based industries have to set up at rural areas where raw material may be available in plenty – helps in the upliftment of the rural economy.
- Provide rural population an opportunity for employment.
- Generate income and thereby improve economic condition of people – which in turn creates potential for demand based industries.
- Provide an opportunity for the dispersal of industries instead of concentrating at a particular place.
- Solve the problem of exploitation of farming community by traders and middlemen.
- Farmers could be assured of better price for their produce.
- Encourage to bring more and more areas under various crops – increase agricultural production and improve nation's economy.
- Transportation cost of agricultural products can be minimized – thereby help to minimize cost of finished goods.
- Avoid wastage of perishable agricultural products.
- Help to develop backward areas based on their suitability for setting up agro- industries.
- Prevent migration of people from rural to urban areas.

Industries are divided into four groups.

1. Resource based
2. Demand based
3. Skill based
4. Ancillary

Again the resource based industries are divided into agro-based, forest based, animal husbandry and poultry based, mineral based, marine based, etc.

Agro-based industries are those industries which have either direct / indirect link with agriculture. Industries which are based on agricultural produce and industries which support agriculture come under agro-based industries.

Types of Agro-based industries

There are four types of agro-based industries.

1. Agro-produce processing units

They merely process the raw material so that it can be preserved and transported at cheaper cost. No new product is manufactured. Ex: Rice mills, Dal mills, etc.

2. Agro-produce manufacturing units

Manufacture entirely new products. Finished goods will be entirely different from its original raw material. Ex: Sugar factories, bakery, solvent extraction units, textile mills, etc.

3. Agro-inputs manufacturing units

Industrial units which produce goods either for mechanization of agriculture or for increasing productivity come under this type. Ex: Agricultural implements, seed industries, pumpset, fertilizer and pesticide units, etc.

4. Agro service centres

Agro service centres are workshops and service centres which are engaged in repairing and servicing of pumpsets, diesel engines, tractors and all types of farm equipment.

Need for Agro-based industries

- Suitable to rural areas as they are raw material oriented.
- For upliftment of rural economy.
- To solve the problem of unemployment.
- To generate income and increase standard of living.
- For decentralization and dispersal of industries.
- To reduce disparity between rural and urban areas.
- To encourage balanced growth between agriculture and industry.
- To solve the problem of exploitation of farming community.
- To reduce transportation costs.
- To give big push to agriculture and act as a source of demand and supply.
- To avoid wastage of perishable agricultural products.
- To prevent migration of rural people.
- To develop suitable backward areas.
- To improve infrastructural facilities.

Institutional Arrangements for Promotion of Agro based Industries

Following Ministries & Departments at the Centre and State level are at present looking after development of agro based industries.

1. Ministry of Agriculture

Deals with rice mills, oil mills, sugar mills, bakeries, cold storage, etc.

2. Khadi and village industries board

Covers traditional agro based industries like „gur“, handicrafts, khandasari, etc.

3. Director General of Trade and Development

Looks after the industries engaged in the manufacture of tractors, power tillers, diesel engines, pump sets, etc.

4. Agro-industries Development Corporation

In each state mainly supply agricultural machinery, inputs and agricultural advisory services to farmers. Some corporations have also undertaken certain manufacturing activities in agro- industries sector.

5. Small Industry Development Organization

Deals with small agro-industries like hosiery, processing of food products, beverages, food and fruit preservation, agricultural implements, pesticide formulations, etc.

Procedure to be followed to set up agro based industries

1. Assessment of agricultural resource potential in the desired areas.
2. Qualification of agriculture output and inputs.
3. Present utilization of resources in existing units
4. Surplus produce left out.
5. Agricultural produce preserving requirements. Even for local consumption of food grains, processing is necessary.
6. Selection of certain items of considerable importance.
7. Follow certain approach for actual location of the units to avoid wastage of resources and maximize utilisation of existing infrastructure.
8. Preparation of industrial profitable and feasibility studies
9. Identification of entrepreneurs.
10. Suggesting appropriate technology and imparting suitable training.
11. Finance and other problems.
12. Marketing assistance.

Constraints in establishing agro based industries

1. Proper guidance is not available to entrepreneurs.
2. It involves some element of risk taking
3. Change in crops / cropping pattern
4. Change in variety of crop due to technological improvement
5. Failure of monsoon may hit the raw material supply.
6. Proper guidance, training for modern and sophisticated agro-industries are not available.
7. As modern small industries are capital intensive, supply of finance will be a considerable problem.
8. Promotional activities such as conducting, intensive campaigns, identifying candidate industries and explaining to entrepreneurs about prospects are inadequate.
9. Uncertainty about future market demands.
10. Absence of information about quantity and quality of market.

11. Multiplicity of agricultural produce and absence of suitable methodology to select best suited industries to a given region.
12. Seasonal supply of agricultural produce may result in under utilization of capacity of the units as the unit will not be working throughout the year. Ex: Sugarcane
13. Industries based on fruits and vegetables may not get the same variety throughout the year, but they may get some other variety.
14. Absence of proper integration among the various agencies of development in the district.

Lecture No. 14

Project- meaning-definition-project cycle-identification-formulation-appraisal- monitoring-evaluation

Meaning and Definition

- Projects are the building blocks of investment plan.
- The whole complex of activities in the undertaking that uses resources to gain benefits constitutes the agricultural project.
- An agricultural project is an investment activity in which financial resources are expended to create capital assets that produce benefits over an extended period of time.
- Project is an activity on which money is spent in expectation of returns and which logically seems to lend itself to planning, financing and implementation as a unit.
- Project is a specific activity with a specific starting point and a specific ending point intended to accomplish a specific objective. It is something which is measurable both in its major costs and returns. It will have some geographic location or at least a rather clearly understood area of geographic concentration. It will have a specific clientele group which it is intended to reach. It will have a relatively well defined time sequence of investment and production activities.

Projects are cutting edge of development. Therefore, we need to identify national agricultural development objectives for selection of priority areas for investment. Sound developmental plans require good projects and good projects require sound planning. Both are interdependent. Project planning seeks to ensure optimization of scarce resources for balanced growth of economy. It should facilitate an analysis in planning, financing, implementation, monitoring, controlling and evaluation.

Characteristics of Agricultural Projects

1. Project is made up of many sub-projects / investments. Ex: Sericulture, palm oil industry, ice factories for fisheries project, construction of 500 dug wells (each well a sub-project).
2. Project increases capital intensity of farm enterprise
3. Investment costs vary according to natural conditions, market conditions and processing conditions
4. The quantum of incremental benefits (income) depends on benefitting area and the level of benefits depends on stage of development farms
5. The level of benefits may, however fluctuate from year to year due to weather conditions.

Types of Agricultural Projects

1. Water Resource Development Projects

These projects include irrigation projects, ground water projects, projects for land reclamation, drainage projects, salinity prevention and flood control.

2. Agricultural Credit Projects

These are called “on-lending projects”. These projects provide credit to the farmers for farm investment for increasing agricultural production, raising their standard of living and the economy as a whole.

3. Agricultural Development Projects

These are the projects aimed at improving farm economy of individuals and regional development.

4. Agro-industries and Commercial Development Projects

Projects of input, services to farming, projects concerned with processing, storage, market development, projects for fisheries development.

PROJECT CYCLE

There tends to be a natural sequence in the way projects are planned and carried out, and this sequence is often called the "project cycle."

The important phases in project cycle are

- (1) Conception or Identification
- (2) Formulation or preparation of the project
- (3) Appraisal or Analysis
- (4) Implementation
- (5) Monitoring
- (6) Evaluation

1. Conception or identification of the project

The first stage in the cycle is to find potential projects. In agricultural projects, costs are easier to identify than benefits because the expenditure pattern is easily visualized.

The various types of costs involved in the project are:

- Project costs: These include the value of the resources in maintaining and operating the projects
- Associated costs: Costs that are incurred to produce immediate products and services of the projects for use or sale

- Primary costs or Direct costs: These include costs incurred in construction, maintenance and execution of the projects
- Indirect costs or Secondary costs: Value of goods and services incurred in providing indirect benefits from the projects such as houses, schools, hospitals, etc
- Real costs and nominal costs: Costs at current market prices are nominal costs, whereas if costs are deflated by general price index, these are termed as real costs
- Social costs: These are technological externalities and technological spill-over accrued to the society due to presence of projects, i.e., pollution problems, health hazards, salinity conditions, etc.

Next to identifying the costs, the estimation of benefits is imperative to ascertain the impact the projects. This is generally done by taking into account two situations, i.e., „with“ and „without“ the projects. The difference is the net additional benefit arising out of the project. Benefits are split into two: tangible and intangible benefits.

- Tangible benefits: Incremental income due to the existence of projects is obtained either from an increased value of production or from reduced costs.
- Intangible benefits: These include better income distribution, national integration, better standard of living, etc.

In identification phase, it is also important to see whether the project is implemented in high priority areas and whether on prima-facie grounds the project is economically feasible.

It is also imperative to identify problems and objectives of the projects and whether the Government gives sanction for the project implementation or not.

The important stages in the process of identification are:

1. Preliminary study
2. Pre-feasibility study
3. Project report

In these stages we assess whether the project proposed on the grounds of prima-facie is feasible and the objectives of the project achieved.

On this ground, the preliminary study should embody the investment proposals, benefits extended from the projects and method of implementation.

Assessment of the demand for the project's products, technical feasibility of the project, import and export requirements, marketing aspects, investment prospects, etc., should be exhaustively covered by the feasibility studies, including the analysis of sensitivity.

Some of the sources through which the projects identified are:

1. Agricultural and allied programmes proposed in the plans of the country as well as states.
2. Areas identified as potential for further development through Governmental surveys
3. Special developmental programmes like IRDP
4. Irrigation projects which offer scope for development through forward and backward linkages.
5. New projects emerging out of existing projects, etc.

2. Formulation or Preparation of the Project:

The following points are considered while formulating the projects.

- The location of the project site must be based on technical analysis and technical feasibility of the projects.
- The location of the project depends up on available physical resources, market conditions, marketing facilities, alternative investment prospects, administrative experience, farmers' objective, technical skill, motivations, demand for products, etc.
- Technical analysis must make into consideration all aspects of technology to be used in the project and account for all inputs of goods and services.
- Assessment of suitability and adequacy of natural resources in advance based on the scientific investigations
- Due consideration to be given to all the organizational, social, economic aspects, etc.
- Technical aspects: The issues which need technical examination are thoroughly analysed here.
- Financial aspects: The implementing agency should be in a position to estimate financial requirements and anticipated returns, through farm planning and budgeting. Once the incremental income is arrived at, the repayment capacity duly giving allowance for risk and uncertainty can be worked out. Cash flow chart can be profitably used here.
- Commercial aspects: The aspects focus on the estimation of effective demand, availability of input supplies and arrangements for the output marketing. Market potentiality for the products needs a careful scrutiny.
- Managerial aspects: If we want successful implementation of the project, effective managerial issues are very crucial. The managerial skills can be sharpened.
- Organisational aspects: Organisation refers to the process of putting the priorities in an orderly form. For proper administration of the projects, efficient personnel and other requirements are indispensable.
- Social aspects: Here customs, culture, traditions and habits etc., of the beneficiaries are considered. The relevant implications like the probable changes in the living standards, material welfare, consumption habits, income distribution effects, etc., fall under this coverage.
- Economic aspects: Here we have to examine the benefits, which the project is going to contribute in terms of the utilization of scarce resources of the nation. The indirect effect like, the income distribution, needs to be assessed.

3. Appraisal or Analysis

Appraisal should take place before the implementation of the project. It is done independently by specialists. In the appraisal stage it is important to know whether the project is technically feasible according to the data available. The technical data for assessing the feasibility of the project

should be consistent with the information available in the office of the sanctioning authority or elsewhere.

Managerial aspects play a key role in the project appraisal. Projects become abortive due to the failure to consider managerial aspects, i.e., such as new skills and information gained by the farmers in the project area, including adoption of new technology. The managerial capabilities and capacity of administrative personnel must also be assessed in project appraisal.

4. Implementation

This is the most crucial phase of the project cycle. The secret of successful implementation depends up on the extent of realism put into the plans drawn beforehand. It is often not uncommon, to notice our plans getting deviated from the reality. Here the role of prudent decisions by the personnel incharge of implementation to take the situation comes into play.

Project implementation can be divided into three different periods, viz., investment period, development period, and full-production period. Investment period may range from few months to few years depending up on the nature of assets to be acquired. Assets proposed should be of superior quality.

Development period too consumes time. Implementing agency should make all efforts to reduce the gestation period as per the plan envisaged in the beginning. Full production period is the time during which the beneficiaries start reaping the benefits of the project.

5. Monitoring

Monitoring is the timely collection and analysis of data on the progress of a project, with the objective of identifying constraints which impede successful implementation. This is highly desirable, particularly when projects fail, to be completed as per time schedule or in the process of attaining the set goals.

It is imperative to get the feedback on the problems faced so that effective measures can be taken up to plug the deficiencies, which hamper the speedy implementation. Monitoring has to be done continuously to offset various shortcomings that crop up from time to time with regard to various aspects of implementation.

6. Evaluation

This is the last phase of the project cycle. Evaluation can be done several times during the life of a project. In the evaluation process, it is important to see, how far the objectives set out in the project are achieved. Deficiencies, snags or failures to achieve the objectives may be analysed and appropriate solutions to such failures answered.

Evaluation process is to be completed in three phases. They are pre-project evaluation, concurrent evaluation and ex-post evaluation.

In the first phase, evaluation is attempted before any change occurs in the existing situation. This is primarily meant to assess economic feasibility of the projects, since it is done at the very beginning. This type of analysis is otherwise called pre-project evaluation.

Sometimes it is also important to take up evaluation when the project is in execution, and such evaluation is called concurrent evaluation. This type of evaluation is basically meant for identifying and analyzing the pitfalls in the execution of the project.

Evaluation is also resorted to particularly when the project is completed in all its phases, in order to assess the achievement of ends or objectives set out by the projects. Such evaluation is called ex-post evaluation or end-evaluation.

Lecture No. 15 & 16

Project appraisal and evaluation techniques-undiscounted measures-pay back period- proceeds per rupee of outlay-Discounted measures-Net Present Value (NPV)-Benefit Cost Ratio (BCR)-Internal Rate of Return (IRR)-Net Nene fit Investment ratio (N/K ratio)-sensitivity analysis

When costs and benefits have been identified, priced, and valued, the analyst is ready to determine which among various projects one is to accept and which to reject. There is no one best technique for estimating project worth (although some are better than others, and some are especially deficient).

The techniques of project appraisal can be discussed under two heads viz., (i) Undiscounted and (ii) Discounted.

- (i) Undiscounted techniques: Include (a) Payback period, (b) Value-added, (c) Capital- Output Ratio, (d) Proceeds per unit of outlay, and (e) Average annual proceeds per unit of outlay.
- (ii) Discounted measures: Under this Net Present Worth (NPW), Benefit-Cost Ratio (BCR), Internal Rate of Return (IRR), N/K Ratio and Sensitivity analysis are prominent.

UNDISCOUNTED TECHNIQUES

Pay Back Period

The payback period refers to the length of time required to recover the capital cost of the project. In other words, it is the length of time from the beginning of the project until the net value of the incremental production stream reaches the total amount of capital investment (Net value of incremental production = value of incremental production less O&M, production cost).

The formula used to workout the pay back period is

$$P = I \div E$$

P = Payback period of the project in years
I = Investment of the project in rupees
E = Annual net cash revenue in rupees

According to this criterion, the shorter the period for recovery the more profitable is the project. This criterion has two important weaknesses viz.,

- a) It fails to consider earnings after the payback period and
- b) It does not adequately take into consideration the timing of proceeds.

Value-Added

It is the amount of economic value generated by the activity carried out within each production unit in the economy. In any production unit, value-added is measured by the difference between the value of the output of the firm and the value of all inputs purchased from outside the firm. The capital and labour attached to each firm are considered internal inputs. Thus, value-added is the value that has been added by the labour and capital of the

enterprise to the economy. Gross value-added includes payment for taxes, interest, rent, profits, and reserves for depreciation. Deducting depreciation gives the net value-added. The sum of all the net value-added is referred to as net domestic product. So the more the value added by the project, the more it will be justified economically.

Capital-Output Ratio

The capital-output ratio is defined as the average value-added produced per unit of capital expenditure. Projects with low capital-output ratio are favoured.

Proceeds Per Unit of Outlay

It is calculated by dividing total net value of incremental production by the total amount of investment. So the higher the proceeds per unit of the outlay, the higher the economic viability of the project. This criterion does not take into consideration the time value of money.

Average Annual Proceeds Per Unit Outlay

To calculate this measure, the total of the net value of incremental production is first divided by the number of years during which it will be realized and then this average of annual proceeds is divided by the total capital cost. So if average annual proceeds per unit of outlay are high, the project will be economically justified for implementation.

DISCOUNTING TECHNIQUES

Discounting techniques take into account the time-value of money. Discounting is essentially a technique by which one can "reduce" the future benefit and cost streams to their present worth.

The technique of discounting permits us to determine whether to accept or reject the projects for implementation that have obviously shaped time-stream that is, patterns of when costs and benefits fall during the life of the project, when they differ from one another and are of different durations.

The most common means of doing this is to subtract year by year the costs from the benefits to arrive at the incremental net benefit-stream, the so-called cash flow and then to discount that. Then we may consider the differences between these present worth and determine what discount rate would be necessary to make the net present worth equal to zero (IRR), derive a ratio of present worth of benefit and cost streams (BCR) and internal rate of return.

Net Present Worth (NPW)

It is simply the present worth of the incremental net benefit or incremental cash flow. It is the difference between discounted benefits and discounted costs of a project.

$$NPV = \sum_{t=0}^T \frac{b_t - c_t}{(1 + r)^t} - K$$

where *NPV* = net present value from project
b_t = benefits (\$) received from project in year *t*
c_t = costs (\$) of project in year *t*

$\frac{1}{1 + r(t)}$ = discount factor at interest rate *r p.a.*

T = lifetime of project
 K = initial (capital) outlay at t = 0

NPW criterion suggests to us to accept all independent projects with a zero or greater net present worth when discounted at opportunity cost. No ranking of acceptable, alternative independent project is possible with the present worth criterion because it is an absolute and not relative measure. A small, highly attractive project may have a smaller net present worth than a larger marginally acceptable project. If both have positive NPW then both projects should be undertaken. It is because of lack of funds we cannot undertake both; the complication is that the opportunity cost of capital has been estimated to be too low. Then the correct response is to raise the estimate of opportunity cost until we have only the selection of projects with NPW that are zero or positive and for which, in fact, there will be just sufficient investment funds.

Example: Estimation of NPW for Two Projects (Hypothetical)

Year	Sericulture (one ha)					Mango orchard (one ha)					
	Costs (in Rs)	Returns (in Rs)	Net income (in Rs)	Discount factor at 12%	NPW (in Rs)	At the end of Year	Costs (in Rs)	Returns (in Rs)	Net income (in Rs)	Discount factor at 12%	NPW (in Rs)
1	38900	-	-38900	0.8929	-34733.81	6 th year	25000	-	-25000	0.507	-12675
2	9239	28475	19236	0.7972	15334.94	7 th year	4250	10260	6010	0.452	2716.52
3	10575	32550	21975	0.7118	15641.81	8 th year	4792	12550	7758	0.404	3134.23
4	11952	35610	23658	0.6355	15034.66	9 th year	5368	14530	9162	0.361	3307.48
5	12858	39802	26944	0.5674	15288.03	10 th year	5975	16275	10300	0.322	3316.60
					<u>NPW</u> 26565.63	11 th year	6456	19396	12940	0.287	3713.78
						12 th year	7187	21470	14283	0.257	3670.73
						Year				<u>NPW</u>	7184.34
<u>Benefit-Cost Ratio (BCR)</u>											

This ratio is obtained when the present worth of the benefit-stream is divided by the present worth of the cost-stream. Note that the absolute value of BCR will vary depending on the interest rate chosen. The higher the interest rate, the smaller the resultant benefit-cost ratio and, if a higher enough rate is chosen, the benefit-cost ratio will be driven down to less than 1. The BCR criterion suggests to us to accept all independent projects with a benefit-cost ratio of 1 or greater, when the cost and benefit streams are discounted at the opportunity cost of capital.

$$BCR = \frac{\sum_{t=1}^n \frac{b(t)}{(1+r)^t}}{\sum_{t=1}^n \frac{c(t)}{(1+r)^t}}$$

The benefit-cost ratio discriminates against projects with relatively high gross returns and operating costs, even though these may be shown to have a greater wealth-generating capacity than that of alternatives with a higher benefit-cost ratio.

Example: Estimation of Benefit-cost Ratio (BCR) for Two Projects (Hypothetical)

Year	Sericulture (one ha)					Mango orchard (one ha)					
	Costs (in Rs)	Gross Returns (in Rs)	Discount factor at 12%	Present worth of costs (in Rs)	Present worth of gross returns (in Rs)	Year	Cost (in Rs)	Returns (in Rs)	Discount factor at 12%	Present worth of costs (in Rs)	Present worth of gross returns (in Rs)
1	38900	-	0.8929		-	6 th	25000	-	0.507	12675.00	
	34733.8					year	4250	10260	0.452	1921.00	4637.52
2	9239	28475	0.7972	7365.33	22700.27	7 th	4792	12550	0.404	1935.97	5070.20
3	10575	32550	0.7118	7527.29	23169.09	8 th	5368	14530	0.361	1937.85	5245.33
4	11952	35610	0.6355	7595.50	22630.16	9 th	5975	16275	0.322	1923.95	5240.55
5	12858	39802	0.5674	7295.63	22583.65	10 th	6456	19396	0.287	1852.87	5566.55
				64517.56	91083.17	11 th	7187	21470	0.257	1847.06	5517.79
						year				24093.70	31278.04
						12 th					
						year					

$$\text{Benefit-cost ratio} = \frac{91083.18}{64517.56} = 1.41 \qquad \text{Benefit-cost ratio} = \frac{31278.04}{24093.70} = 1.30$$

Internal Rate of Return (IRR)

It is the discount rate that makes the NPW of the incremental net benefit-stream or incremental cash flow equal to zero. It is the maximum interest that a project could pay for the resources used if the project is to recover its investment and operating costs and still break even.

It is the rate of return on capital outstanding per period while it is invested in the project. IRR criterion suggests to us to accept all independent projects having an internal rate of return equal to or greater than the opportunity cost of capital. One cannot simply choose that discount rate which will make the incremental net benefit-stream equal to zero.

There is no formula for finding the internal rate of return straightaway. We are forced to resort to a systematic procedure of trial and error to find that discount rate which will make the net present worth of incremental net benefit-stream equal to zero.

The most difficult aspect of the trial and error procedure is making the initial estimates. If the estimate is too far from the final result, then several trials will have to be made to find two rates close enough together to permit accurate interpolation (interpolation is the process of finding a desired value between two other values).

The formula of interpolation is given below:

$$= \text{discount rate} + \frac{\text{Difference between two discount rates}}{\text{Difference between two discount rates}} \times \frac{\text{NPV at lower discount rate IRR}}{\text{Sum of NPVs at lower and higher discount rates (signs ignored)}}$$

In practice, it is better not to interpolate between intervals greater than about five percent because the wider intervals can easily introduce an interpolation error.

Example: Estimation of IRR for Sericulture (one ha) (Hypothetical)

Year	Costs (in Rs)	Gross income (in Rs)	Net income (in Rs)	Discount factor (40%)	Net present worth (in Rs)	Discount factor (43%)	Net present worth (in Rs)
1	38900	-	-38900	0.7143	-27786.27	0.6993	-27202.77
2	9239	28475	19236	0.5102	9814.21	0.4890	9406.4
3	10575	32550	21975	0.3644	8007.69	0.3419	7513.25
4	11952	35610	23658	0.2603	6158.17	0.2391	5656.62
5	12858	39802	26944	0.1859	5008.89	0.1672	45.5.04
			52913		1202.69		-121.46

$$\text{IRR} = 40 + 3 \left[\frac{1202.69}{1202.69 + 121.46} \right] = 40 + 3(0.9083) = 40 + 2.7249 = 42.7249\% = 42.7\%$$

Net Benefit-Investment Ratio (NBIR) (N/K Ratio)

NBIR is simply the present worth of net benefits divided by the present worth of investment. To calculate this measure, simply divide the sum of the present worth after the incremental net benefits-stream has turned positive by the sum of the present worth of the negative incremental net benefits in the early years of the project.

The reason for calculating the net benefit-investment ratio in this manner is that we are interested in an investment measure that selects projects on the basis of return to investment during the initial phases of a project. If the net benefit - investment ratio is 1 or greater, when we are discounting at the opportunity cost of capital, choose the project beginning with the largest ratio value and proceed until available investment funds are exhausted. It may be used to rank projects in those instances in which, for one reason or another, sufficient funds are not available to implement all the projects. It, thus, satisfies a frequent request of the decision- makers that projects be ranked in the order in which they should be undertaken. It is suitable for use when there is incomplete knowledge of all the projects.

At any given discount rate we cannot, with confidence, use the net present worth, or the internal rate of return, or the benefit-cost ratio as ranking measures; our criterion tells us only to accept all projects which need the selection criterion for those three measures. The net benefit-investment ratio is the only measure of the ones we have discussed that can be used with confidence to rank directly.

Sensitivity Analysis (Treatment of Uncertainty)

Several times when the project is under execution, certain things go wrong with the project with the result that the desired benefits cannot be achieved within the stipulated time frame. For example, the actual execution of the project is delayed or the cost exceeds the original estimated cost (cost over-run). In such cases, the results get fairly changed. Many times, the IRR and NPW thus get reduced or the BCR becomes negative from positive. In order to take care of this problem, while the projects are under preparation or under examination, certain assumptions are applied for testing the viability of the project.

For example, it is at times assumed that there will be a cost over-run by, say, 25% or a reduction in revenues, say, by 10% or a delay in getting the benefits, say, by three years and so on. Keeping one or two or all such assumptions in view, the streams of costs and benefits are

re-drawn and the figures of costs and benefits are discounted and the NPW, BCR and IRR are re-worked out. This gives a fairly good picture as to what will be the fate of the projects if such problems occur. For the sensitivity analysis, it is very essential to carry out such an exercise in projects where high financial stakes are involved.

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