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**JAGAT GURU NANAK DEV  
PUNJAB STATE OPEN UNIVERSITY, PATIALA**

**(Established by Act No. 19 of 2019 of the Legislature of State of Punjab)**

**Certificate Course**

**In**

**Rural Management**

**CCRM 3**

**RURAL MANAGEMENT**

**Head Quarter: C/28, The Lower Mall, Patiala-147001**

**WEBSITE: [www.psou.ac.in](http://www.psou.ac.in)**

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**JAGAT GURU NANAK DEV PUNJAB STATE OPEN UNIVERSITY, PATIALA**  
**(Established by Act No. 19 of 2019 of the Legislature of State of Punjab)**

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**PREFACE**

Jagat Guru Nanak Dev Punjab State Open University, Patiala was established in December 2019 by Act 19 of the Legislature of State of Punjab. It is the first and only Open University of the State, entrusted with the responsibility of making higher education accessible to all, especially to those sections of society who do not have the means, time or opportunity to pursue regular education.

In keeping with the nature of an Open University, this University provides a flexible education system to suit every need. The time given to complete a programme is double the duration of a regular mode programme. Well-designed study material has been prepared in consultation with experts in their respective fields.

The University offers programmes that have been designed to provide relevant, skill-based and employability-enhancing education. The study material provided in this booklet is self-instructional, with self-assessment exercises, and recommendations for further readings. The syllabus has been divided in sections, and provided as units for simplification.

The University has a network of 110 Learner Support Centres/Study Centres, to enable students to make use of reading facilities, and for curriculum-based counselling and practicals. We, at the University, welcome you to be a part of this institution of knowledge.

Prof. G S Batra  
Dean Academic Affairs

## **CERTIFICATE COURSE IN RURAL MANAGEMENT**

### **CCRM 3: RURAL MANAGEMENT**

Max. Marks: 100

External: 70

Internal: 30

Pass: 40%

Credits: 6

#### **Objectives:**

To develop educated rural human resource having skill and know-how required to promote rural area.

#### **INSTRUCTIONS FOR THE CANDIDATES:**

Candidates are required to attempt any two questions each from sections A and B of the question paper and any ten short questions from Section C. They have to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.

#### **Section A**

Unit 1: Rural Crop: Financing, Production and Marketing

Unit 2: Rural Livestock Management: Financing, Production and Marketing, Rural,

Unit 3: Rural Development Management: Issues in Management of Rural Development Projects, Project Dimension, Identification and Formulation,

Unit 4: Project Appraisal-I (Technical Feasibility) Project Appraisal-II (Economic Feasibility), Project Appraisal-III (Financial Feasibility)

Unit 5: Programme Implementation (Activity Planning and Network Analysis), Monitoring Development Projects, Project Evaluation.

Unit 6: Natural Resources Management: Drought-Prone Areas Programme, Desert Development Programme, Integrated Wasteland Development Programme, Social Forestry and Joint Forest Management.

#### **Section B**

Unit 7: Application of ICT for Rural Management.

Unit 8: Application of Remote Sensing and GIS in Rural Development: Natural Resource Management, Watershed Management,

Unit 9: Rural Infrastructure Management, Disaster Management.

Unit 10: Communication Channels: Uses for Rural Management, Communication Strategies for

## Rural Management

Unit 11: Media Mix for Rural Development - Audio – visual aids in proper sequence - Cross-media approach - Media forum – Using social media for rural management.

### **Suggested Reading**

- A.R. Desai (Ed). Introduction of Rural Sociology in India.
- B.C. Mehta, Rural poverty in India, concept, publisher.
- K.R. Gupta, Rural Development in India, Atlantic Publishers and Distributors (P) Ltd.
- M. Soundarapandian, Rural Entrepreneurship: Growth and Potentials, Kanishka Publisher.
- C.B. Mammoria, Indian Social Problems, Kitab Mahal Publisher



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**CERTIFICATE COURSE IN RURAL MANAGEMENT**  
**CCRM 3: RURAL MANAGEMENT**  
**COURSE COORDINATOR AND EDITOR: DR. PINKY SRA**

**SECTION A**

<b>UNIT NO.</b>	<b>UNIT NAME</b>
UNIT 1	RURAL CROP: FINANCING, PRODUCTION AND MARKETING
UNIT 2	RURAL LIVESTOCK MANAGEMENT: FINANCING, PRODUCTION AND MARKETING, RURAL
UNIT 3	RURAL DEVELOPMENT MANAGEMENT: ISSUES IN MANAGEMENT OF RURAL DEVELOPMENT PROJECTS, PROJECT DIMENSION, IDENTIFICATION AND FORMULATION
UNIT 4	PROJECT APPRAISAL-I (TECHNICAL FEASIBILITY) PROJECT APPRAISAL-II (ECONOMIC FEASIBILITY), PROJECT APPRAISAL-III (FINANCIAL FEASIBILITY)
UNIT 5	PROGRAMME IMPLEMENTATION (ACTIVITY PLANNING AND NETWORK ANALYSIS), MONITORING DEVELOPMENT PROJECTS, PROJECT EVALUATION
UNIT 6	NATURAL RESOURCES MANAGEMENT: DROUGHT

**SECTION B**

<b>UNIT NO.</b>	<b>UNIT NAME</b>
UNIT 7	APPLICATION OF ICT FOR RURAL MANAGEMENT
UNIT 8	APPLICATION OF REMOTE SENSING AND GIS IN RURAL DEVELOPMENT: NATURAL RESOURCE MANAGEMENT, WATERSHED MANAGEMENT
UNIT 9	RURAL INFRASTRUCTURE MANAGEMENT, DISASTER MANAGEMENT.
UNIT 10	COMMUNICATION CHANNELS: USES FOR RURAL MANAGEMENT, COMMUNICATION STRATEGIES FOR RURAL MANAGEMENT
UNIT 11	MEDIA MIX FOR RURAL DEVELOPMENT - AUDIO – VISUAL AIDS IN PROPER SEQUENCE - CROSS-MEDIA APPROACH - MEDIA FORUM – USING SOCIAL MEDIA FOR RURAL MANAGEMENT

## SECTION B

UNIT NO.	UNIT NAME
UNIT 7	APPLICATION OF ICT FOR RURAL MANAGEMENT
UNIT 8	APPLICATION OF REMOTE SENSING AND GIS IN RURAL DEVELOPMENT: NATURAL RESOURCE MANAGEMENT, WATERSHED MANAGEMENT
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UNIT 11	MEDIA MIX FOR RURAL DEVELOPMENT - AUDIO – VISUAL AIDS IN PROPER SEQUENCE, CROSS-MEDIA APPROACH IN RURAL DEVELOPMENT, MEDIA FORUMS, USING OF SOCIAL MEDIA FOR RURAL MANAGEMENT



# **CERTIFICATE COURSE IN RURAL MANAGEMENT**

## **COURSE: RURAL MANAGEMENT**

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### **UNIT I RURAL CROP MANAGEMENT: FINANCING, PRODUCTION AND MARKETING**

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#### **STRUCTURE**

##### **1.0 Objectives**

##### **1.1 Introduction (Rural Crop Management: Financing)**

##### **1.2 Rural Crop Business and Control**

###### **1.2.1 Steps or Stages of Rural Crop Business Analysis**

###### **1.2.2 Advantages of Rural Crop Records and Accounts**

###### **1.2.3 Problems in Rural Crop Accounting**

###### **1.2.4 Types of Rural Crop Records**

##### **1.3 Rural Crop Planning and Control**

##### **1.4 Production Records**

##### **1.5 Rural Crop Financial Records**

###### **1.5.1 Income Statement**

###### **1.5.2 Net worth Statement**

##### **1.6 Systems of Book Keeping**

##### **1.7 Introduction Rural Crop Management and Production**

##### **1.8 Definitions**

##### **1.9 Rural Crop Management Decisions**

##### **1.10 Factors Influencing Rural Crop Management Decisions**

##### **1.11 Decision Making Methods**

##### **1.12 Steps in Decision Making**

##### **1.13 Production and Organization Decisions**

###### **1.13.1 Strategic Management Decisions**

### **1.13.2 Operational Management Decisions**

#### **1.14 Administrative Decisions**

#### **1.15 Marketing Decisions**

#### **1.16 Relationship between Rural Crop Management and Other Sciences**

#### **1.17 Characteristics of Farming and Rural Crop Business**

#### **1.18 Rural Crop Management Problems under Indian Conditions**

#### **1.19 Introduction (Rural Crop Management: Marketing)**

#### **1.20 Evolution of Rural Crop Input Marketing**

#### **1.21 The 4 Ps in Rural Crop Marketing**

##### **1.21.1 Product Strategy**

##### **1.21.2 Pricing Strategy**

##### **1.21.3 Place Strategy**

##### **1.21.4 Promotion Strategy**

#### **1.22 Market for Rural Crop Produces**

#### **1.23 Challenges in Rural Marketing**

##### **1.23.1 Transportation:**

##### **1.23.2 Communication**

##### **1.23.3 Availability**

##### **1.23.4 Warehousing**

##### **1.23.5 Village Structure**

##### **1.23.6 Rural Markets and Sales Management**

##### **1.23.7 Inadequate Banking and Credit Facilities**

##### **1.23.8 Market Segmentation in Rural Markets**

##### **1.23.9 Branding**

##### **1.23.10 Packaging**

## **Questions**

## **Suggested Readings**

### **1.0 Objectives**

1. Achieving National and Household Food Security
2. Improving Rural Livelihoods and Achieving Household Food Security
3. Strengthening Natural Resource Management.
4. How much and how fast should growth be growth and development
5. Profitability and amounts of profit are feasible.

## **Rural Crop Management and Financing**

### **1.1 Introduction:**

About 68% of the Indian population practices agriculture. Hence, the production and management of crops is an important aspect to ensure optimal productivity in the fields. The major agricultural practices involved in crop production and management are listed below:

- Preparation of Soil
- Sowing of Seeds
- Addition of Manure and Fertilizers
- Irrigation
- Protection from Weeds
- Harvesting
- Storage

### **Preparation of Soil**

The soil is loosened and tilled before the seeds are sown. Ploughs are used for the purpose. If the soil contains big lumps, they are broken with the help of a hoe. This process aerates the soil so that the roots breathe easily. The nutrients and minerals get properly mixed with the soil and come at the top. Thus, the fertility of the soil increases and is fit for plantation.

### **Sowing of Seeds**

The good quality, infection-free seeds are collected and sown on the prepared land. The seeds should be sown at proper depths and proper distances. Following are the various methods used to sow the seeds:

- Traditional techniques
- Broadcasting
- Dibbling
- Drilling
- Seed dropping behind the plough
- Transplanting
- Hill dropping
- Check row planting

### **Addition of Manures and Fertilizers**

The soil may not have the right nutrients to efficiently sustain plant growth. Hence, manures and fertilizers are added to the soil to increase its fertility and help plants grow better. Manure is prepared by using decomposing plant and animal matter in compost pits. Fertilizers, on the other hand, are chemicals prepared in factories which contain nutrients for a specific plant. They give faster results than manures. However, when excessively used, they turn the soil infertile.

### **Irrigation**

Crops require water at regular intervals for proper growth. The supply of water to the plants is known as irrigation. Well, rivers, lakes, tube-wells are different sources for irrigation. The traditional methods of agriculture involve the use of humans and animals. The various traditional ways are moats, chain-pump, dhekli, rahat.

The modern techniques of irrigation include the sprinkler system and the drip system. Water is very important for the germination of seeds. It helps in the proper development of flowers, fruits, seeds, and plants. Therefore, it should be present in plants in large quantities.

### **Protection from Weeds**

The undesirable plants that grow along with the crops are called weeds. These weeds feed on the nutrients provided to the crops and thus reduce the supply of nutrients to the crops, thereby, inhibiting their growth. The growth of these weeds needs to be prevented in order to enhance the growth of the plants.

The process of removal of weeds is called weeding. To achieve this, weedicides are employed, which essentially chemicals are specifically made to destroy weeds. They are usually sprayed before seeding and flowering.

## **Harvesting**

When the crop matures, it is cut for further processing. This process is known as harvesting. It is usually manual labour, done with the help of sickle. However, mechanical harvesting is used these days – machines such as combine harvesters are used where the crops are harvested and threshed in one go.

- **Threshing-** Separation of grains from the harvested crops is called threshing. It is done either mechanically or by cattle.
- **Winnowing-** The separation of grains and chaff is called winnowing. It is done either mechanically or manually.

## **Storage**

The grains should be properly stored if they are to be kept for longer periods. They need to be protected from pests and moisture. The freshly harvested seeds should be dried before they are stored. This prevents the attack from microorganisms and pests.

The harvested and separated grains are stored in airtight metallic bins or in the jute bags. Dried neem leaves are added to protect them from damage at home. Large amounts of grains are stored in granaries or silos with specific chemical treatments, to protect them from pests and insects.

## **Food from Animals**

Animals are an important source of food. The rearing of animals for food is known as animal husbandry. Some animals like cows and buffaloes are reared for milk, others for meat like goats and poultry. Some people consume fish as a part of their diet. Honey bees are reared for honey. Thus, animals are an integral source of food and food products.

## **1.2 Rural Crop Business and Control**

Efficient managers intend to be able to determine the position of a business at any point of time. They also want a basis for evaluating where the business is going on. This helps their control of the business operations overtime. Thus, the objectives of Rural Crop business at a particular point of time are:

- i. To evaluate the performance of the business at a particular point of time;
- ii. To identify the weakness of the business;
- iii. To remove the hurdles and improve the business; and
- iv. To prepare financial documents like balance sheet and income statement so as to acquire credit, design farm policies and prepare tax statement.

### 1.2.1 Steps or Stages of Rural Crop Business Analysis

- a) Proper recording of accounts and performance.
- b) Analysis of the statistics.
- c) Interpretation of the results.

**a. Recording of accounts and performance:** A systematic recording of information on financial aspects of the rural crop is essential for farm business analysis and for this purpose, a sound knowledge on book keeping and accounting is essential.

**b. Analysis of statistics:** The data collected would be useful to construct balance sheet and income statement. Financial ratio analysis would also increase the farm efficiency.

**c. Interpretation of the results:** The financial analysis would indicate the performance of the business and suggest measures for improvement. The interpretation of results would be more useful to understand the performance of the business.

### 1.2.2 Advantages of Rural Crop Records and Accounts

- a) They are the means to increase the rural crop income.
- b) They are the basis for diagnosis and planning.
- c) They show the ways to improve the managerial ability of the farmer.
- d) They are useful for credit acquisition and management.
- e) They provide database for conducting research in agricultural economics.
- f) They form the basis for designing government policies - land policy, price policy, national rural crop policies, etc.

### 1.2.3 Problems in Rural Crop Accounting

- a) As Indian farmers carry out only subsistence nature of farming, recording is not necessary to them.
- b) Indian farmer acts as an owner, manager and labourer. Hence, recording becomes complex.
- c) Illiteracy and lack of business awareness of farmers prohibit them to have farm records.
- d) Fear of taxation prevents farmers from recording and accounting the information.
- e) Forecasting becomes complicated because of very high risk and uncertainties involved in farming.

**1.2.4 Types of Rural Crop Records:** Rural crop records can be classified into three categories, i.e., inventories, production records and financial records.

- a) Inventory:** Rural crop inventory includes a complete listing of all that a rural crop owns and owes at a particular date, generally at the beginning and the end of each agricultural

year. It includes not only the listing of physical assets but also assigning values of all such assets, liabilities and debts as well. There are two steps involved in taking a rural crop inventory.

**1) Examination of Physical Assets:** It includes a complete listing of all the physical assets including a verification of weights and measurements. The losses, wastages, shrinkages or gains, which accrue over time, are all accounted for.

**2) Valuation of Physical Assets:** A few common methods of valuation are discussed below:

- i. **Valuation at Cost:** The amount of money actually invested on the asset when

**Return per Year (R)** 1,000

**Present Value (PV)** = Rs. 10,000

**Interest Rate per Annum (r)** 0.10

it was acquired is entered in the inventory. This method has the following limitations: a) it cannot be used for the valuation of farm products; b) the effects of inflation and deflation are ignored; and c) original investment value has only a limited use, when valuation is taken up somewhere in the middle of the business.

- ii. **Cost or market prices whichever is lower:** This is used for valuing the purchased farm supplies.
- iii. **Net Selling Price:** It represents market price less the selling costs. For all assets that will be sold within the year, the net selling price is used. Crops or livestock produced for the market can be valued with this method.
- iv. **Cost less Depreciation:** The value of asset in subsequent years can be estimated by subtracting the depreciation from its cost. Machinery, breeding livestock and buildings constructed recently can be evaluated with this method. But this method cannot be applied for products produced from the farm.
- v. **Replacement Cost:** It represents a value of an asset, which is equal to the cost needed to reproduce the asset at the present prices and under the existing technological improvements. This method may be successfully employed for the valuation of fixed and long-lived assets.
- vi. **Replacement Cost less Depreciation:** It represents an improvement over the previous method as it provides a more realistic valuation of fixed and long-lived assets like buildings, particularly, when wide price changes occur. However, this method should be used very carefully as it may often lead to over valuation.

- vii. **Income Capitalization:** For assets like land whose contribution towards the income can be measured for each production period and which has long life, income capitalization is an ideal method of valuation. If a certain piece of land is expected to give an uniform income of Rs.1,000 per year indefinitely and the rate of interest is 10 per cent per annum, the present value of the land, then, can be easily assessed by using this method, i.e., 227

Thus, the piece of land in question would be valued at Rs.10,000.

### **1.3 Rural Crop Planning and Control**

Elements of planning, objectives, steps and formulation of rural crop plans - Rural crop level management information systems- Rural Crop Budgeting, Partial, enterprise and complete budgeting.

### **1.4 Production Records**

These records provide information on the input-output relationship of different enterprises on the farm. This type of information is useful both for measuring production efficiency and preparing efficient farm plans. Production records have limited utility, as they do not indicate the financial position.

However, they show the quantity and time of application of various resources to different enterprises on the farm and the yield and other physical performance of different enterprises.

Some of the popular physical records are: a) Rural Crop Map, b) Crop Records (season, crop and yield particulars), c) Livestock Feed Record, d) Production Record of Livestock and e) Labour Records (to study labour efficiency and seasonal requirement of labour).

### **1.5 Rural Crop Financial Records**

Rural crop financial records provide valuable information on economic efficiency of the rural crop

**1) Cash analysis account book** is the most important financial record to be maintained by the farmer. The cash transactions, expenses and receipts, are recorded in a cash analysis.

**2) Trading Account:** Trading Account is often used interchangeably with “profit and loss account”. All the items in the cash analysis account book are repeated in this trading account.

Purchases and expenses are put on the left-hand side and the sales and receipts on the right hand side. Also, the closing valuation is put on the right-hand side and the opening valuation on the left-hand side. If the right-hand side total is greater than that of the left-hand, the rural crop has earned profit. The profit is entered on the left-hand side but the loss on the right-hand side.

#### **1.5.1 Income Statement**



Income statement indicates how well the farm business has performed during the accounting period. From this, we can get an idea of the returns to various resources after deducting the expenses and also about overall earnings of the rural crop. This is an important financial record because it measures the financial progress and profitability over a period of time. It is a summary of both cash and non-cash transaction of the farm business. In non-cash financial transaction, we get capital gain and depreciation. Income statement is divided into two major categories, viz., income and expenses. Income includes cash receipts, capital sales of business and changes in inventory value of items produced in the farm. Expenses include operating and fixed expenses.

**i) Inventory:** It is a complete listing of all assets. Items like supplies, grain and feed held for sale are listed on the inventory form.

**ii) Capital Sales of the Business:** The sale of milch animals and equipment are major items under this heading. These types of receipts are separated from normal cash receipts because they must be reported differently on tax forms.

**iii) Changes in Inventory:** In making adjustment for changes in inventory value, both changes in price and quantity should be taken into consideration. If the ending inventory value is greater than the beginning inventory value, it should be treated as a form of income. If opposite holds true it should be considered as negative income.

**iv) Operating and Fixed Expenses:** Operating expenses generally vary with the size of the business operation. But fixed expenses do not significantly vary with changes in volume of business done under the period of reporting.

### **1.5.2 Net worth Statement**

Net worth statement is also known as balance sheet. It is a summary of assets, liabilities and owner's equity (net worth) at a given point of time. This statement shows the value of assets that would remain, if the farm business is liquidated and all the outside claims against the business are paid. A business is considered solvent, if the value of assets exceeds debt level. It is very useful for the lender for scrutinizing the loan application.  $\text{Net worth} = \text{Assets} - \text{Liabilities}$ .

**a) Current Assets:** Cash on hand or in the bank and other assets in the possession of the farm, which may be liquidated in the normal operation of the business like products held for sales and supplies, are called current assets. The liquidation of these items will have the least effect on the business to continue its operation.

**b) Working Assets or Intermediate Assets:** Assets which are normally used up during the life of the business such as farm equipment and machinery, breeding and producing livestock can be categorized under this. They have the life of one to ten years. The liquidation of these assets would

have a significant influence on business activity. These assets are somewhat more difficult to liquidate than current assets.

**c) Fixed Assets or Long Term Assets:** Assets like land, building and land improvements are difficult to convert into cash. They are long-term permanent assets. These are not likely to be liquidated. If a major portion of these assets were liquidated, the business would also be terminated in most cases. The sum of current, intermediate and long-term assets is the total assets of the business. The claim against is divided between debts of the business and owner's equity (net worth).

**ii) Liability:** A liability is defined as, "a claim by others against the farm business, like mortgages and accounts payable". Liabilities can be classified into:

**a) Current Liabilities:** Liabilities, which call for immediate payment, generally within one year and which cannot be deferred, are called the current liabilities. They include rents, taxes and interest, plus that portion of principal on intermediate and long-term debt due within the next twelve months.

**b) Intermediate Liabilities:** They are also known as medium term liabilities, which can be deferred for the present. They are not of immediate concern but have to be paid between one and ten year period.

**c) Long-term Liabilities:** Any deferred liability, which has to be met after ten years and generally upto 20 years, is called the long-term liability. They consist of mortgages and land contracts.

### **iii) Net Worth**

Net worth is estimated by subtracting total liabilities from total assets. It reflects the owner's equity in the business and in other personal property. The net worth statement is one of the primary documents used by lending agencies in evaluating requests for new loans or extension of existing loans. It is also useful for calculating financial ratios of the farm business.

## **1.6 Systems of Book Keeping**

There are two systems of farm accountancy, namely, i) Singly entry system and ii) Double entry system.

**i) Single Entry System:** This system ignores the double effects of transactions, namely, receipts and payments. It is therefore, relatively imperfect. Its results are less reliable and its accuracy cannot be tested by means of a trail balance, which is possible under the double entry system alone.

**ii) Double Entry System:** Every transaction is recorded twice in the accounts, i.e., to the debit side of one account and to the credit side of another. Each category of assets, liability, expense and income will be allocated an account in the ledger and this account will usually be divided into a debit (entry of a sum owing) (left hand side) and credit (right hand side). Each transaction has a twofold aspects of giving and receiving. The giving account is credited. The receiving account is

debited, i.e., receiving cash is debited. Giving goods (sales account) is credited. In selling paddy for Rs 1200, there are two accounts, viz., cash account and Rural Crop account. The cash account will be the receiving account and hence the amount will be written on the debit side of it. The paddy account will be the giving account; hence the amount will be written on the credit side of it. One of the in-built checks of a double entry system is that a trial balance can be prepared and the failure of the trial balance to balance credit and debit indicates that there are errors in the accounts. Since every debit entry in a ledger has a corresponding credit entry or entries, it follows that the total debit and credit balances in the accounts must be also equal. The double entry system has a number of advantages over other systems. They are as follows:

- a) It can record all types of transaction.
- b) Full information can be extracted quickly from the accounts at any time.
- c) A check on arithmetical accuracy is built into the system.

## **Rural Crop Management and Production**

### **1.7 Introduction**

Rural Crop management has assumed greater importance not only in developed and commercial agriculture all round the world but also in developing and subsistence type of agriculture. A Rural Crop manager must not only understand different methods of agricultural production, but also he must be concerned with their costs and returns. He must know how to allocate scarce productive resources on the farm business to meet his goals and at the same time react to economic forces that arise from both within and outside the farm.

The need for managing an individual farm arises due to the following reasons:

- i. Farmers have the two objectives, viz., maximization of farm profit and improvement of standard of living of their families.
- ii. The means available to attain the objectives, i.e., the factors of production, are limited in supply.
- iii. The farm profit is influenced by biological, technological, social, economic, political and institutional factors.
- iv. The resources or factors of production can be put to different uses.

Rural Crop management is concerned with resource allocation. On one hand, a farmer has a set of farm resources such as land, labour, farm buildings, working capital, farm equipments, etc. that are relatively in short supply. On the other hand, the farmer has a set of goals to achieve may be maximum family satisfaction through increasing net farm income and employment generation. In between these two ends, the farmer himself is with a specific degree of ability and consciousness.

This gap is bridged by taking a series of rational decisions in respect of farm resources having another uses and opportunities.

The study of rural crop management would be useful to impart knowledge and skill for optimizing the resource use and maximizing the profit. The following definitions would throw light on the meaning of rural crop management:

### **1.8 Definitions**

Rural crop agriculture means a piece of land where crop and livestock enterprises are taken up under a common management and has specific boundaries. All farm management economists can be categorized into three groups on the basis of whether they consider rural crop management as an art, science or business.

Rural crop Management is a science that deals with the organization and operation of a farm as a firm from the point of view of continuous maximum profit stable with the family welfare of the farmer. Thus, in an environment where a farmer desires to achieve goals like profit maximization and improvement of family standard of living with a inadequate stock of factors of production which can be put to different uses rural crop management in an essential tool.

### **1.9 Rural Crop Management Decisions**

Farmers must be able to take appropriate decisions at correct time. Incorrect judgement and decisions would result in the failure of execution of farm plan and in turn economic loss. The farm management decisions can be largely categorized into two ways.

- I. The first method of classifications is according to the following criteria: a) Importance, b) Frequency, c) Imminence, d) Revocability and e) Alternatives available.

Each of the above criteria is discussed briefly.

- a) **Importance:** Rural crop management decisions vary as to the degree of importance measured generally through the magnitude of profit or loss involved. For example, a decision to engage in poultry is moderately more important than a decision concerning the type and location of poultry shed.
- b) **Frequency:** Many decisions assume importance on the farm because of their high frequency and repetitive nature. The decision about what and how much to feed to the dairy animals is made more often than that regarding the method or time of harvesting of paddy.
- c) **Imminence:** It refers to the penalty or cost of waiting with respect to different decisions on the rural crop. Experience shows that while it pays to act quite promptly in some cases, deferment is necessary in other cases till the essential complete information becomes available. For example, the decision to harvest paddy is much more imminent than a decision about buying a tractor.

- d) **Revocability:** Some decisions can be changed at a much lower cost as compared to others. For example, it is relatively easier to change paddy with groundnut, which perhaps becomes more profitable, than to convert a mango orchard into a sugarcane plantation.
- e) **Alternatives available:** The number of alternatives can also be used for classifying Rural Crop management decisions. The decisions become more difficult as the number of alternatives increase. For example, threshing of paddy can be done manually or with thresher.

Classification of decisions based on the above criteria is not mutually exclusive and is changing from individual to individual and from place to place for the same individual.

- II. The second method classifies rural crop management decisions into: a) what to produce? b) when to produce? c) how much to produce? and d) how to produce?

The rural crop manager should choose the enterprises based on availability of resources on the farms and likely profitability of the enterprise. This is studied through product-product relationship. Once the farmer decides on what to produce, he must also decide on when to produce, as the majority of the agricultural commodities are season bound in nature. Then, he should decide how much of each enterprise to produce, since the supply of agricultural inputs is limited. This can be studied through factor - product relationship. In order to minimize the cost of production, i.e., decisions relating to how to produce, factor-factor relationship has to be studied. The farm manager should also take marketing decisions like a) what to buy? b) when to buy? c) how much to buy? d) how to buy? e) what to sell? f) when to sell? g) how much to sell? and h) how to sell?

### **1.10 Factors Influencing Rural Crop Management Decisions:**

Rural crop management decisions continuously undergo change overtime because of the changing environment around the farm, farmer and his family. The factors which influence the decision making process are:

- a) Economic factors like prices of factors and products.
- b) Biological characteristics of plants and animals.
- c) Technological factors like technological advancements in the field of rural crop and suitability of different varieties and rural crop practices to varied agro - climatic conditions.
- d) Institutional factors like availability of infrastructural facilities which include storage, processing, grading, transport, marketing of inputs and outputs, etc, government policies on farm practices, input subsidies, taxes, export and import, marketing, procurement of produces and so on.
- e) Personal factors like customs, attitude, awareness, and personal capabilities and so on.

One or more changes of the above categories in the environment around the farmer may cause imperfections in decision-making. The process of decision making, therefore, has to be dynamic so as to adjust in such changes.

### 1.11 Decision Making Methods

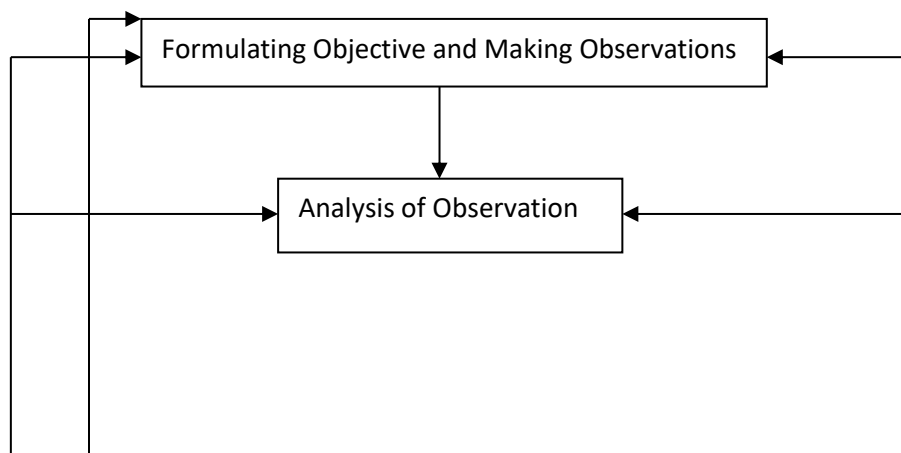
Every farmer has to make decisions about his farm organization and operation from time to time. Decisions on the farms are often made by the following three methods:

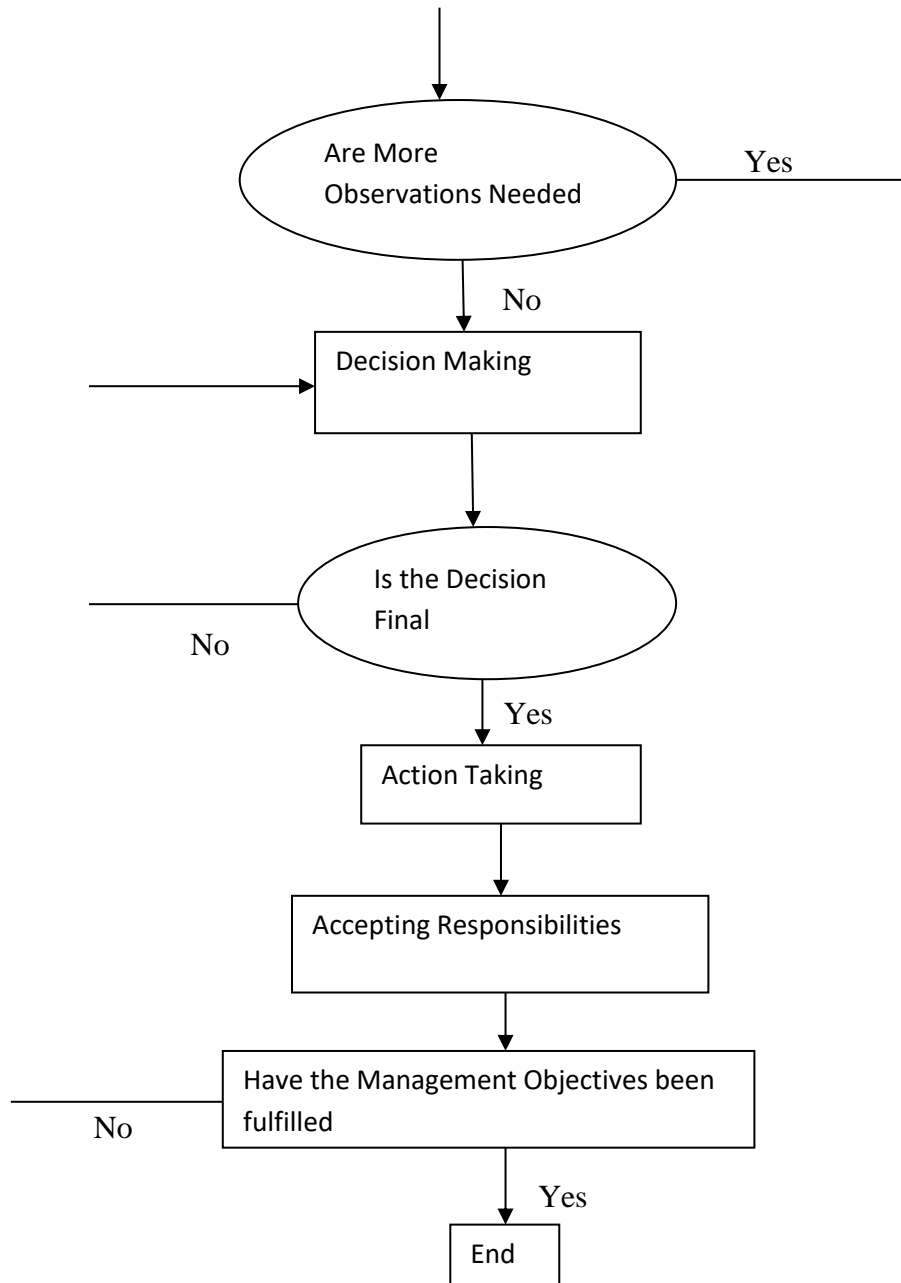
- a) **Traditional method:** In this method, the decision is influenced by traditions in the family or region or community.
- b) **Technical method:** In this method, the decisions require the use of technical knowledge. For example, a decision is to be made about the quantity of nitrogen necessity to obtain maximum output of paddy.
- c) **Economic method:** All the problems are considered in relation to the expected costs and returns. This method is without doubt the most useful of all the methods for taking a decision on a Rural Crop.

### 1.12 Steps in Decision Making

The steps in decision - making can also be shown schematically through a flow chart. The important steps involved in the decision-making process are formulating objectives and making observations, analyses of observations, decision-making, action taking or execution of the decisions and accepting the responsibilities. The evaluation and monitoring should be done at each and every stage of the decision making process.

#### Steps in Decision Making Process





The third classification of Rural Crop management functions indicates that the Rural Crop management decisions or functions can be categorized into production, administration and marketing functions as depicted in the chart.

**1.13 Production and Organization Decisions:** The Rural Crop production decision in farm include human resources management (hiring and supervision of casual and permanent labour), utilization of funds, accounts and record maintenance, financial transactions, accessing

We can divide this into i) strategic management decisions and ii) operational management decisions.

**1.13.1 Strategic Management Decisions:** Strategic management decisions will observe that decision making and **strategic planning** both are processes. For example, several basic questions can be used to begin describing strategic planning:

- where are we,
- where do we want to go, and
- how do we get there.

**a) Deciding about the size of the farm:** The size of Rural Crop depends upon type of Rural Crop business, irrigation, mechanization, usage of land and managerial ability.

**b) Planning on rural crop labour and machinery:** Deciding the most profitable combination of the factors to be used in producing a product is one of the significant rural crop decisions. What combination of rural crop labour and machinery should be adopted must be taken into account?

**c) Planning on structure of buildings:** Planning the size and type of structure of buildings involve huge investment, which become fixed resource for the business. Structure of buildings, for the present model and stage of production depends upon the type and stage of crops or livestock produced.

**1.13.2 Operational Management Decisions:** Operations management in crop management flyover the knowledge on operations for crop machinery. It will apply the technical engineering approach to crop management.

#### **1.14 Administrative Decisions:**

Each state needs to focus on the planned future development of its rural areas. This needs an organised framework for the preparation of plans as well as an administrative structure for the control of future growth. Professional involvement is essential for the preparation of plans. Presently such matters are being handled by local politicians in league with the administrators, and this has disastrous implications. This is an issue that Niti Aayog, the central body responsible for planning, needs to address.

#### **1.15 Marketing Decisions**

A rural crop farmer will buy different types of raw material from the market and when he produces certain goods then he will sell the output in the market. When the farmer will purchase the material from market he will take into consideration. What when from whom and how to buy the product or raw material as same when he will sell the material in the in the market.

#### **1.16 Association between Rural Crop and Sciences**



Farming is an integral part of rural crop production economics. Rural crop is an intra-farm science whereas rural crop production economics is an inter farm science. The distinction sometimes made between production economics and farm management is based on macro and micro level contents respectively. Various rural crop economic problems regarding finance, land tenure, marketing, etc., are concerned at farm level, the field of speciality related to each difficulty becomes an essential part of rural crop field.

### **1.17 Characteristics of Rural Crop and Rural Crop Business:**

Farming as a business has many distinguishing features from most of other industries in their management methods and practices. The major differences between farming and other industries are:

- 1) Rural crop production is biological in nature.
  - 2) Rural crop production heavily depends on agro-climatic conditions.
  - 3) Rural crop production is carried out mostly in small - sized holdings.
  - 4) Frequent and speedy decisions are to be taken up in agricultural production. For instance, there is no time to consider the merits of paying more wages to drain the field when there is a sudden monsoon floods.
- Grade structure for rural crop commodities is also very weak.
- 5) Slow turn -over: It takes long time to recover the investment.
  - 6) Rural crop financing is more risky due to drought, pest and disease attack, yield variations, etc.
  - 7) The proportion of fixed cost is more in agriculture and so adjustment and substitution of resources are more difficult.
  - 8) Inelastic income demand for farm products: As income increases, the demand for agricultural products will increase in lesser proportion when compared with industrial goods.
  - 9) Perishable and bulky nature of rural crop commodities cause storage, processing and transportation problems.
  - 10) Lack of Knowledge: All farmers do not know the latest developments in Rural Crop technologies.
  - 11) Rural crop markets are not regulated properly and there are too many middlemen in the agricultural marketing system, whereas in industry, the distribution channels are well defined and controlled by producers.

### **1.18 Rural Crop Problems**

Rural Crop problems in India are different from one place to another depending largely on the infrastructure and the resources availability. Some of the following common problems in the ground of rural crop are:

1) Rural crop as a household: In most parts of the country, farmers, especially dry land farmers, follow the traditional combinations of crops and methods of cultivation. Work habits are closely associated with food commodities consumed and living conditions. Farm has become the means of livelihood of farmers and hence, subsistence farming is followed. Home management, thus, heavily influences and gets influenced by rural crop management decisions.

2) Inadequate capital: The new technology demands costlier inputs such as fertilizer, plant protection measures, irrigation and high yielding variety seeds as well as investment on power and machinery. But perpetual debt and low marketable surplus prevent the farmers from adopting new technologies.

3) Under employment: Unemployment results from

1) small size of farm, 2) large supply of family labour, 3) seasonal nature of production and 4) lack of subsidiary or supporting rural industries. It reduces efficiency and productivity of rural manpower.

4) Slow adoption innovations: Small farmers are usually conservative and sometimes skeptical of new techniques and methods. However, once they try a new idea and find it effective, they are eager to adopt that. The rate of adoption, however, depends on farmer's willingness and his ability to use the new information.

## **Rural Crop Management and Marketing**

### **1.19 Introduction**

In the 1950's and 60's the emphasis in development planning was concentrated upon national and sectoral planning. Regional planning was mainly seen in a physical and structural context and project planning, except for some of the very large schemes was constrained within a strict technically based framework. Projections of growth of GDP and the growth of the market economy were the main aspects of economic planners, whereas social and educational aspects.

### **1.20 Evolution of Rural Crop Input Marketing**

It consists of following phases

**Phase –I** (From Independence to the middle of sixties) Rural Crop Produces like Food grains, Industrial inputs, cotton, oilseeds, sugarcane etc. are the main focus. The marketing focus for the firms supplying Rural Crop inputs was on fertilizers, seeds & pesticides etc. The artisans like blacksmiths, carpenters, cobblers & pot makers in rural areas who are supplying bamboo baskets,

ropes, window & door frames, tools like ploughs, etc. received secondary consideration. Market for

Tractors, harvesters, threshers, pump sets etc. was insignificant.

**Phase – II** [From middle of 1960s (Green Revolution) to mid nineties] During the period of green revolution the introduction of scientific farming practices have transformed villages into booming centres of business opportunities. The demand for Rural Crop inputs increases. Better irrigation facilities, soil testing, use of high yield variety of seeds, fertilizers, pesticides, and employment of machinery like power tills, harvesters, threshers etc. transformed the rural picture. Marketing of Rural Crop inputs attends higher significance. Two separate areas of events developed that is the traditional agricultural Marketing & the marketing of Rural Crop inputs from urban areas to rural farmers. Marketing of produces from rural received extensive attention. The establishments of agencies like Khadib & Village Industries Commission (KVIC), Girijan Cooperative Societies and special attention of govt. to promote these products. Village industries thrived and products like – Handicrafts, soaps, safety matches, crackers, handloom textiles etc. were sold in urban markets on large scale.

**Phase – III** (Middle of 1990s to 20th century) The marketing of household consumables and durables which was not the focus during the earlier phases was now attends greater significance. Earlier the rural market for the products from the urban areas was not large enough. These markets were remote, spread across distant areas. Small villages were far and wide making it difficult & expensive.

**Phase –IV** (21st century the era of Developmental marketing) the objective of present rural crop marketing is to enhancement of quality of life by satisfying the needs and wants of customers. It tries to offer a broad and integrated solution which involves a set of interconnected products & services. Faster development in Rural India, tied with increase in purchasing power because of scientific farming, changing lifestyle and consumption patterns, increase in education, social mobility, improved means of transportation & communications and other infiltrations of mass media like TV and its various satellite channels have exposed rural India to outside world and hence their outlook to life has changed. The focus is to integrate the rural population to the national mainstream and growth.

### **1.21 The 4 Ps in Rural Crop Marketing**

The 4Ps of marketing has to be altered as per the requirements and expectations of the rural farming population.

#### **1.21.1 Product Strategy**

The farmer consumers are more interested to know the technical details or the performance of the rural crop inputs. There is higher importance of product knowledge and advisory services provided by the technicians. The rural farmers markets generally show their liking for simple and easy to use products. The packaging of the product should give lot of pictorial demonstration and guides for convenience and easy to use. Spending too much unnecessary additional packaging increases the cost and does not add any convenience. The product literature on the cover packaging and in the user manuals should be expressed in simple and easy to understand local language. The information on the product should provide the clear functional benefits and in an unambiguous manner. The products should be able to stand up to the expected needs rural farmers and provide them value for money they spent.

### **1.21.2 Pricing Strategy**

Rural crop inputs and industrial products share similar response patterns from the farmer users. It is being found that buyers of rural crop inputs products are more quality conscious than price conscious. Response to the different offering is likely to be influenced by the price factors. The rural customer is price sensitive and expects value for money. Therefore, the pricing has to be in accordance with their expectation. Marketing companies have to develop strategies that can make their products cheap for rural customers. Moreover the concept of value analysis should be applied to rural markets to make the products affordable. The technique value analysis involves replacing costly raw materials with inexpensive ones, without sacrificing quality and functionality. If the product belongs to an expensive category, then the positioning has to be done in a way that the product is perceived as a bundle of utilities by the rural customer, which still provides value for money in this category.

### **1.21.3 Place Strategy**

The levels of channel and the network intensity required for agricultural inputs are relatively higher than that required for industrial products. The channel act as dispenser of rural crop input. The channel plays the role of both Pulling as well as pushing function. It is supported by advertisement, demonstrations, personal contacts and other extension means. All possible efforts should be made to make the products available near the target audience. Direct contact with the local suppliers and retailers needs to be established. Cooperative societies, public distribution system, feeder markets, village weekly markets fairs and festivals can be utilized to ensure adequate distribution of rural crop products.

Formulating an integrated and efficient channel of distribution will always remain a challenge for the rural crop marketers. Several companies in this sector have established distribution systems that are able to cater to the rural farming people efficiently.

#### **1.21.4 Promotion Strategy**

The rural crop consumers share many similarities with the consumer goods customers. For example, the number of prospects to be reached is large, diverse and spread across different regions similarly the product groups require elaborate market segmentation. The promotional activities should be undertaken through media that are comfortable and appropriate for the rural areas. Positive word-of-mouth through local reference groups and opinion leaders is considered as the key to success in the rural markets. Traditional art forms such as puppet shows and street plays or creating awareness through village panchayat members can prove to be fruitful. Other methods like distribution of pamphlets, use of mobile vans for publicity and advertising through wall posters can also assist in establishing a relationship with the rural consumers.

#### **1.22 Market for Rural Crop Produces**

Rural Crop marketing concerned with two aspects: that is the marketing of the farm produces and marketing of rural crop inputs that are consumed by the farms to produce rural crop produces.

Agriculture and allied sector contribute 11.85% of the total GDP and provide employment to around 54% Indian population (Planning Commission, 2014). The use of chemical fertilizers, pesticides and higher farm mechanization have played a positive role in increasing Rural Crop productivity and making India self-sufficient in food grain production. In the 21st century, the challenges in Indian rural crop sector are quite different from the last decades. The higher emphasis to produce more food from less land with declining natural resources is a difficult task for the farmers. To keep up the steady of growth farm output a careful economic evaluation of inputs like seeds, fertilizers, irrigation sources etc. are of considerable importance. The impressive growth in rural crop production since independence has been generated by higher input use, particularly purchased inputs as well as technology induced productivity improvement. The key inputs which changed the face of rural crop in India include HYV (High Yielding Variety) seeds, chemical fertilizers, irrigation, pesticides, farm machineries and equipment, credit and labour. A specialized marketing effort is required to reach the farmers who are spread across the nooks and corners of the country. The paper tries to reveal the existing marketing and distribution network for the inputs that are used in the rural crop production.

Rural crop Inputs are defined as products permitted for use in organic farming. These include feedstuffs, fertilizers and permitted plant protection products as well as cleaning agents and additives used in food production. These rural crop inputs range from improved seeds, fertilizers and crop protection chemicals to machinery, irrigation and knowledge. Seeds are critical to successful crop production and inevitably, farm productivity and profitability. Fertilizer supplies nutrients to the soil that are essential for growth. Input supply is an essential condition for rural crop production and supply response. Inputs are either produced on the farm, such as farm produced seeds, manure and compost, farm tools, etc.

Rural crop marketing is a dominant topic in the Indian marketing literature. The main focus is on marketing of rural crop produce and that of rural crop inputs like fertilizers, pesticides, seeds and farm machineries.

The rural crop inputs can be classified into Consumables and Durables/Capital inputs. The consumable Inputs can be seeds, fertilizers, pesticides, etc. On the other hand, the durable capital inputs can be tractors, harvesters, threshers, pump sets, etc. Classification of rural crop

With food being the crowning need of mankind, much emphasis has been on commercializing rural crop production. For this reason, adequate production and even distribution of food has of late become a high priority global concern. Rural crop produce has also been defined in section 65B of the GST Act which means any produce of rural crop on which either no processing is done or such processing is done as is usually done by a cultivator or producer which does not alter its essential characteristics but makes it marketable for primary market. It also includes specified processes in the definition like tending, pruning, grading, sorting etc. which may be carried out at the farm or elsewhere as long as they do not alter the essential characteristics.

Today's rural crop marketing has to undergo a series of exchanges or transfers from one person to another before it reaches the consumer. There are three marketing functions involved in this, i.e., assembling, preparation for consumption and distribution. Selling on any rural crop produce depends on some couple of factors like the demand of the product at that time, availability of storage etc. The products may be sold directly in the market or it may be stored locally for the time being. Moreover, it may be sold as it is gathered from the field or it may be cleaned, graded and processed by the farmer or the merchant of the village. Sometime processing is done because consumers want it, or sometimes to conserve the quality of that product. The task of distribution system is to match the supply with the existing demand by whole selling and retailing in various points of different markets like primary, secondary or terminal markets. Most of the Rural Crop produces in India are sold by farmers in the private sector to moneylenders or to village traders and are sold in various ways. For example, it might be sold at a weekly village market in the farmer's village or in a

neighbouring village. If these outlets are not available, then produce might be sold at irregularly held markets in a nearby village or town, or in the Mandi. In India, there are several central government organizations, who are involved in agricultural marketing like, Commission of Rural crop Costs and Prices, Food Corporation of India, Cotton Corporation of India, Jute Corporation of India, etc.

There are also specialized marketing bodies for rubber, tea, coffee, tobacco, spices and vegetables. Under the Agricultural Produce (grading and marketing) Act of 1937, more than forty primary commodities are compulsorily graded for export and voluntarily graded for internal consumption. Although the regulation of commodity markets is a function of state government, the directorate of marketing and inspection provides marketing and inspection services and financial aid down to the village level to help set up commodity grading centres in selected markets. As we have a tradition of rural crop production, marketing and allied commercial activities, now it is the time for us to brainstorm and come out with new ideas of value added services. These value added services will give the existing Rural Crop engine a new dimension. The next logical step could be food processing which not only could be another revenue generating area but also can provide lots of fulltime employment to our youths. With the changing rural crop scenario and global competition, there is a need of exploiting the available resources at maximum level. Another important development in the field of regulated markets is the keen interest taken by the International Development Agency (IDA) in the development of the infrastructure in regulated markets. The IDA is financing the development of infrastructure in 50 markets of Bihar. There is also some good news on the front of irrigation, rural infrastructure, restoring water bodies and water harvesting. Another action initiated to improve the governance of the Small Farmers Agribusiness Consortium (SFAC) including the appointment of a banker as the chief executive; necessary additional capital to be provided to SFAC.

### **1.23 Challenges in Rural Marketing**

There are many problems to be tackled in rural marketing, despite rapid strides in the development of the rural sector. Some of the common problems are discussed below

**1.23.1 Transportation:** Transportation is an important aspect in the process of movement of products from urban production centres to remote villages. The transportation infrastructure is extremely poor in rural India. Due to this reason, most of the villages are not accessible to the marketing man. In our country, there are six lakhs villages. Nearly 50 per cent of them are not connected by road at all. Many parts in rural India have only kachcha roads. During the monsoons, even these roads become unserviceable. Regarding rail transport, though India has the second

largest railway system in the world, many parts of rural India however, remain outside the rail network.

**1.23.2 Communication:** Communication in rural crop markets suffers from different types of limitations. An Overview International Journal of Research in Business Studies and Management 5 percentage is still low, compared to urban areas. In India, there are 18 recognized languages. All these languages and many dialects are spoken in rural areas. English and Hindi are not understood by many people. Due to these problems, rural consumers, unlike urban consumers do not have exposure to new products.

**1.23.3 Availability:** Availability of Appropriate Media It has been estimated that all organized media in the country put together can reach only 30 per cent of the rural population of India. The print media covers only 18 per cent of the rural population. The radio network, in theory, covers 90 per cent. But actual listenership is much less. TV is popular, and is an ideal medium for communicating with the rural masses. But it is not available in all interior parts of the country. It is estimated that TV covers 20 per cent of the rural population. But the actual viewership is meager. The cinema, however, is a good medium for rural communication. But, these opportunities are very low in rural areas.

**1.23.4 Warehousing:** Storage function is necessary because production and consumption cycles rarely match. Many agricultural commodities are produced seasonally, whereas demand for them is continuous. The storage function overcomes discrepancies in desired quantities and timing. In warehousing too, there are special problems in the rural context. The central warehousing corporation and state warehousing, which constitute the top tier in public warehousing in our country, have not extended their network of warehouses to the rural parts. It is almost impossible to distribute effectively in the interior outlets in the absence of adequate storage facilities. Due to lack of adequate and scientific storage facilities in rural areas, stocks are being maintained in towns only.

**1.23.5 Village Structure:** In our country, the village structure itself causes many problems. Most of the villages are small and scattered. It is estimated that 60 per cent of the villages are in the population group of below 1,000. The scattered nature of the villages increases distribution costs, and their small size affects economic viability of establishing distribution points.

**1.23.6 Rural Markets and Sales Management:** Rural marketing involves a greater amount of personal selling effort compared to urban marketing. The rural salesman must also be able to guide the rural customers in the choice of the products. It has been observed that rural salesmen do not properly motivate rural consumers. The rural salesman has to be a patient listener as his customers are extremely traditional. He may have to spend a lot of time on consumer visits to gain a favourable



response from him. Channel management is also a difficult task in rural marketing. The distribution channels in villages are lengthy involving more intermediaries and consequently higher consumer prices. In many cases, dealers with required qualities are not available.

**1.23.7 Inadequate Banking and Credit Facilities** In rural crop markets, distribution is also handicapped due to lack of adequate banking and credit facilities. The rural outlets require banking support to enable remittances, to get replenishment of stocks, to facilitate credit transactions in general, and to obtain credit support from the bank. Retailers are unable to carry optimum stocks in the absence of adequate credit facilities. Because of this problem, they are not able to offer credit to the consumers. All these problems lead to low marketing activities in rural areas. It is estimated that there is one bank for every 50 villages, showing the poor banking facilities in rural areas.

**1.23.8 Market Segmentation in Rural Markets** Market segmentation is the process of dividing the total market into a number of submarkets. The heterogeneous market is broken up into a number of relatively homogeneous. Market segmentation is as important in rural marketing as it is in urban marketing. Most firms assume that rural markets are homogeneous. It is unwise on the part of these firms to assume that the rural market can be served with the same product, price and promotion combination.

**1.23.9 Branding:** The brand is the surest means of conveying quality to rural consumers. Day by day, though national brands are getting popular, local brands are also playing a significant role in rural areas. This may be due to illiteracy, ignorance and low purchasing power of rural consumers. It has been observed that there is greater dissatisfaction among the rural consumers with regard to selling of low quality duplicate brands, particularly soaps, creams, clothes, etc. whose prices are often half of those of national brands, but sold at prices on par or slightly less than the prices of national brands. Local brands are becoming popular in rural markets in spite of their lower quality.

**1.23.10 Packaging:** As far as packaging is concerned, as a general rule, smaller packages are more popular in the rural areas. At present, all essential products are not available in villages in smaller packaging. The lower income group consumers are not able to purchase large and medium size packaged goods. It is also found that the labelling on the package is not in the local language. This is a major constraint to rural consumers understanding the product characteristics.

### **Questions**

1. Define Rural Crop Management? How rural crop planning and control would be done according to financing concept?
2. What do you mean by rural crop management? Write down the rural crop management decisions
3. Write down the rural crop management problems under Indian conditions?

4. What are the characteristics of farming and rural crop Business?
5. Write down the Phases of evolution of rural crop input marketing? Describe the 4p's of rural crop marketing?
6. What do you mean by rural crop management? Which markets are available for rural crop management? List out type of challenges which would be faced by the rural crop farmers?

## **Suggested Readings**

- Katar Singh (2009), Rural Development: Principles, Policies and Management, SAGE Publications India Pvt. Ltd. Publication year: 2009.
- Indian Council of Social Science Research, A Survey of Research in Economics, Vol. IV, Part-1 and Part-II, Allied Publishers Pvt. Ltd., New Delhi, 1975.
- H. D. Foth & I. M. Turk, Fundamentals of Soil Science, Wiley Eastern
- Bneerjee G. D, Srijeet (2012), Rural Entrepreneurship Development Programme in India, An Impact Assessment, Abhijeet publication

## **CERTIFICATE COURSE IN RURAL MANAGEMENT**

### **COURSE: RURAL MANAGEMENT**

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#### **UNIT 2 RURAL LIVESTOCK MANAGEMENT: FINANCING, PRODUCTION, MARKETING**

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#### **STRUCTURE**

##### **2.0 Objectives**

##### **2.1 Introduction (Rural Livestock Management: Financing)**

##### **2.2 Projected Operated Area Guidelines in Agriculture**

## **2.3 Credit Reach**

## **2.4 Evolution of Agricultural Finance in India and Policy Milestones**

## **2.5 Measures to Improve the Reach of Institutional Credit**

## **2.6 Federal Institution in Agriculture**

## **2.7 Digital Innovations in Agriculture Sector**

## **2.8 Institutional Agricultural Credit - Agency-wise Share**

## **2.9 Regional Disparity in Agricultural Credit**

## **2.10 Improving KCC scheme - Scale of Finance**

## **2.11 Priority Sector Lending Certificate**

## **2.12 Impact of Farm Loan Waiver**

### **2.12.1 Genesis of Farm Loan Waivers**

## **2.13 Policy Alternatives**

## **2.14 National Livestock Mission**

### **2.14.1 List of Beneficiaries**

## **2.15 Definition and Introduction (Rural Livestock Management: Production)**

## **2.16 Deriving Maximum Satisfaction**

## **2.17 Income and Employment**

## **2.18 Economic Development**

## **2.19 Divisions of Economics**

## **2.20 Economics-a Social Science**

## **2.21 A science or an art?**

## **2.22 Want, goods, wealth, utility, price, value, assets, capital, money, income etc.**

## **2.23 Important features of land, labour, capital and organization**

## **2.24 Theories of demand supply and cost**

## **2.25 Substitution effect income effect and price effect**

**2.26 Theories of production (law of diminishing return, increasing return, constant return and return to scale) Theory of production**

**2.27 Livestock Production**

**2.28 Statistics of Livestock Production Sector**

**2.28.1 Livestock Population**

**2.28.2 Contribution of Livestock Sector towards National Wealth**

**2.28.3 Role in Economy**

**2.28.4 Future Outlook**

**2.28.5 Value of Output**

**2.28.6 Milk Production**

**2.28.7 Egg Production**

**2.28.8 Wool Production**

**2.28.9 Meat Production**

**2.28.10 Other Roles**

**2.29 Salient Features of 19th Livestock Census**

**2.30 Introduction (Rural Livestock Management: marketing)**

**2.31 Classification of Market**

**2.31.1 Classification of market on the basis of geographical area**

**2.31.2 Classification of market on the basis of time**

**2.31.3 Classification of market on the basis of volume of business**

**2.31.4 Classification of market on the basis of nature of product**

**2.31.5 Classification of market on the basis of consumption**

**2.31.6 Classification of market on the basis of competition**

**2.31.7 Classification of market on the basis of seller's position**

**2.31.8 Classification of market on the basis of nature of transaction**

### **2.31.9 Classification of market on the basis of control**

### **2.32 The seven steps of livestock marketing**

#### **Questions**

#### **Suggested Reading**

## **2.0 Objectives**

1. Prepare the livestock and enabling policy assessment.
2. Prepare the production systems assessment.
3. Prepare the trends assessment.
4. Identify livestock development objectives.
5. Identify the livestock development strategy.
6. Economic importance, based on non-marketed products and services.
7. Predict the consequences that social trends will have on production systems.
8. Predict future demand and supply trend.
9. Profitability and amounts of profit whether feasible through livestock.

## **Rural Livestock Management and Financing**

### **2.1 Introduction**

Livestock is an integral part of the livelihood of India's rural population. It contributes significantly to the overall output of the country's agricultural industry. Farming in India depends to a large degree on the vagaries of monsoon. If the rains fail, crops wither.

Livestock plays a crucial role in mitigating that risk. It provides alternative employment – especially for women – and income opportunities.

As the critical mechanism to cope with crop failure, it helps generate assets and bolsters the financial security of rural Indian farmers, many of whom are among the poorest people in the country.

While livestock contributes to the nutritional diet and food security of the people, the growth of the sector in different states is very uneven.

Accelerating growth in the Punjab, Haryana and Gujarat regions is in stark contrast to states like Odisha, which lags behind. The divergence is due to the policy focus of different state governments.

Depending on the incentives and infrastructure provided by the states, the sector grows or stalls.

Developing this sector in a country where 250 million people or 51% of the total employed population works in agriculture is crucial. In a country that still faces rising population numbers the

livestock-raising industry can potentially provide work for many, assure food security and generate additional income – a cornerstone for further development and economic growth.

Another set of risks has to do with a shortage of fodder. The monsoon determines how much is available in the country. If the rains fail, supplies drop at a time when farmers are most in need.

At the same time, falling production due to underfed animals makes it more challenging to secure the revenues necessary to cover rising prices in the fodder market. In breeding farms, there is also the risk that the production of higher yielding animals is not successful.

India still has plenty of room to increase animal productivity by switching to better breeds of animals. If these new breeds underperform, this is a risk to the breeders.

These risks become even more serious if the sector grows and changes.

The growing number of urbanites in India will mean city dwellers becoming increasingly dependent on accessing animal products from the countryside. To meet this demand many smallholders in India will, over time, need to develop into commercial farmers, and sell the surplus they make to the growing cities. Transforming subsistence farming into an agricultural enterprise also means that farmers will become more aware of the risks they face because livestock failure will be tantamount to business failure. To protect their revenues, the coming decades will see them looking increasingly to insurance as a means to deal with business risks.

## **2.2 Projected Operated Area Guidelines in Agriculture**

1. The rural sector is an important component of the Indian economy as it provides livelihood to a large section of the population. According to Census 2011, out of the total workers of 481.7 million, there are 118.7 million cultivators and 144.3 million agricultural labourers, which means approximately 55 per cent of the total workers were employed in agriculture and allied sector. However, the percentage share of workers engaged in agriculture sector has been declining. As per Labour Bureau Report 2015-16, 46.1 per cent of the working population was employed in agriculture and allied sector. Further, as per an ILO estimate employment in agriculture sector as percentage of the total employment was approximately 44 per cent in the year 2018.
2. As per Agriculture Census 2015-16, the total number of operational holdings in the country was 146 million and total operated area was 157.14 million hectares in 2015-16. The small and marginal holdings taken together (0.00-2.00 ha) constituted 86.21 per cent, while their share in the operated area stood at 47.34 per cent in 2015-16. The average size of land holding in 2015-16 was 1.08 hectare.

3. Agriculture plays a significant role in the development of the Indian economy. However, the contribution of agriculture to GDP has gone down from 52 per cent in the 1950s to 30 per cent in the 1990s and further below 20 per cent from 2010 onwards. In 2018-19, the share of Agriculture & Allied GVA in overall GVA at 2011-12 prices was 14.4 per cent and at current prices was 16.14 per cent.
4. Indian agriculture and allied sector broadly covers four activities, viz., crop, livestock, forestry and fisheries. To stimulate the productivity of these activities, Government of India (GoI) has, from time to time, given policy thrusts which led to the various agricultural revolutions, viz., green revolution in cereal production (late 1960s-early 1980s) which was succeeded by the white revolution in milk production (starting in the 1970s), the gene revolution in cotton production, (in early 2000) and the blue revolution which focused on increasing fisheries production and productivity (1973-2002). As a result, the agriculture sector has not only become self-sufficient but has emerged as the net exporter of several agricultural commodities like rice, marine products, cotton etc.
5. Such a phenomenal achievement would not have been possible without the agricultural credit related policy interventions by GoI and RBI. Realising the importance of institutional credit in fostering the growth and development of the agriculture sector, the All India Rural Credit Survey Committee (AIRCSC, 1951-54) had laid the foundation of the institutional framework to establish a sound credit delivery system for financing agriculture and allied activities. Till the end of the 1960s cooperative structure had assumed the responsibility of providing production credit to the farmers. With the objective of imposing social control, commercial banks were nationalised in 1969 and 1980. Further, in 1976, RRBs were set up as alternative agencies to provide rural credit. These developments brought in a sea change in the flow of institutional credit to the farm sector. As a consequence, the farmers' credit requirements were increasingly met by the formal institutional sources. Gradually the country moved towards a multi-agency approach to meet the credit needs of the farmers.
6. The National Credit Council, in its meeting held in July 1968, emphasised that commercial banks should increase their involvement in the financing of priority sectors, viz., agriculture and small-scale industries. The description of the priority sectors was later formalised in 1972 based on the report submitted by the Informal Study Group on Statistics relating to advances to the Priority Sectors constituted by the Reserve Bank in May 1971. Over the years the scope of priority sector lending has evolved to give greater focus to those segments of the population that have traditionally been neglected from accessing credit, thus making it a tool to address the problem of financial exclusion.

7. The impact of the institutional framework put in place has largely leveraged the formal credit to the agriculture sector. From ₹37.71 billion in 1981 (approximately 16 per cent of the agricultural GDP in 1980-81), the SCBs' outstanding advances to agriculture and allied activities have grown significantly to ₹13694.56 billion in 2017-18 which formed approximately 16 per cent of total bank credit, i.e. ₹86254.25 billion and approximately 51 per cent of Agriculture & Allied GVA at current prices.
8. Despite the impressive growth in the formal agricultural credit, there are several issues and challenges which are enumerated below:
  - I. Credit Reach – As per the NAFIS Report 2016-17, the average loan taken by agricultural households indicated that 72 per cent of the credit requirement was met through institutional sources and 28 per cent from non-institutional sources. Further, in the absence of a proper legal framework and lack of records relating to their agricultural activity, tenant farmers/ share croppers/ oral lessees/ landless labourers face difficulty in accessing institutional credit. As per PSA Annual return (2015-16), only 41 per cent of small and marginal farmers could be covered by public and private sector banks. Besides these problems and challenges of accessibility in credit, the share of credit to allied activities i.e., livestock, forestry and fisheries was sub-optimal compared to its contribution to agricultural output.
  - II. Regional Disparity in Agricultural Credit – Some of the states are getting much higher share, as high as 10 per cent of total agricultural credit compared to other states getting as low as 0.5 per cent. Also, in some states, viz., Bihar, Chhattisgarh, Jharkhand, West Bengal, etc., bank credit was not proportionate to their share in agricultural output.
  - III. Loan Waiver - Loan waivers announced by state governments have affected the credit culture in the country with many borrowers withholding repayment, in anticipation of a loan waiver. This adversely affected the credit history of borrowers and their future prospects of availing fresh loan for agricultural purposes. This led to further deterioration of credit culture as evident from the high level of Gross NPA of 8.44 per cent as on March 31, 2019 in the agriculture sector.
9. To look into these issues, the Reserve Bank of India vide its Sixth Bi-Monthly Monetary Policy Committee (MPC) meeting held during February 05-07, 2019 announced the setting up of an 'Internal Working Group to Review Agricultural Credit' to understand the reasons for regional disparity and other agricultural credit related aspects and suggest workable solutions to address the constraints in accessing institutional agricultural credit.



### **2.3 Credit Reach**

Enabling policy environment and evolution of Indian banks led to the outreach of formal agricultural credit to the last mile to a great extent. An analytical presentation of the distribution of agricultural credit across states, however, highlights regional disparity, skewedness towards crop loan and inadequate credit allocation to allied activities.

### **2.4 Evolution of Agricultural Finance in India and Policy Milestones**

The institutional framework of agricultural finance was shaped by the overarching demands of the nation. The evolution of agricultural credit policies and milestones can be broadly categorised into three distinctive phases.

#### **I. Phase 1 (1951 – 1969)**

1. The Government of India initiated the first five-year plan in 1951 with the thrust on developing the primary sector. The National Credit Council in a meeting held in July 1968 emphasised that commercial banks should increase their involvement in the financing of priority sectors, viz., agriculture and small-scale industries, sectors deemed as ‘national priority’.
2. In 1969, when the first phase of nationalisation of banks took place, there were 6955 public sector bank branches and the average population per branch office was 64,000. To boost rural development, the Reserve Bank of India had then prescribed 1:3 ratio for opening of branches in urban and rural/semi-urban centres.

#### **II. Phase 2 (1970-1990)**

1. The channel for institutional credit to agriculture during the first two decades of independence was the cooperative sector. With the nationalisation of commercial banks in 1969, the decade of 1970s marked the entry of commercial banks into agricultural credit. This period saw the introduction of the Lead Bank Scheme and regulatory prescription of Priority Sector Lending – two landmark development policies that have not only survived till date but have also served as the fuel for channelling agricultural credit and rural development.
2. The Regional Rural Bank Act, 1976 was enacted to provide sufficient banking and credit facility for agriculture and other rural sectors.
3. The National Bank for Agriculture and Rural Development (NABARD) came into existence in 1982, with the enactment of NABARD Act 1981, to promote agriculture and rural development.

4. NABARD, in 1992 introduced the Self-Help Group (SHG) model to further financial inclusion of the excluded segments.
5. In 1989, the Reserve Bank introduced the service area approach (SAA) and Annual Credit Plan (ACP) system as tools for reaching out to the rural areas.

### **III. Phase 3 (1991 onwards)**

1. The economic reforms of the 1990s, started with the implementation of the first Narasimham Committee Report of 1991, emphasising financial soundness and operational efficiency of the financial sector – including that of rural financial institutions. The Reserve Bank of India gradually deregulated the interest rate regime to aid improvement in the operational efficiency of banks.
2. The first major nationwide farm loan waiver was announced in 1990 and the cost to the national exchequer was around ₹100 billion.
3. Pursuant to the 1995 Union Budget announcement, GoI established the Rural Infrastructure Development Fund (RIDF) with NABARD. RIDF was mainly meant for funding of rural infrastructure projects which in turn were supposed to deepen the credit absorption capacity in a state by giving loans to state governments and state-owned corporations. Scheduled commercial banks contribute to the corpus of the fund to the extent of their shortfall in achieving the priority sector lending target.
4. During 1992-93, NABARD started the pilot project on SHG-Bank Linkage programme - a partnership model involving SHGs, banks and NGOs. In the initial years, the scheme progressed slowly but picked up gradually.
5. The Kisan Credit Card (KCC) was introduced as a financial product in 1998 to provide hassle free credit to farmers.
6. The Union Government introduced the Ground Level Credit (GLC) policy in year 2003-04. Under this policy, GOI announces GLC targets for agriculture and allied sector in the Union budget every year which banks are required to achieve during the financial year. These targets are set region-wise, agency-wise (SCBs, RRBs & Cooperative banks) and loan category wise (crop and term loan).
7. Another policy initiative, introduced in 2004–2005, was to double the volume of credit to agriculture over a period of three years and expand the reach of formal finance.
8. The year 2006 saw a host of developments. Pursuant to the budget announcement for 2006-07, the Union Government introduced the interest subvention scheme (ISS) for short term crop loans to enable farmers to avail farm credit at reduced interest rates. The Business Correspondents (BCs) and Business Facilitators (BFs) were rolled out for the first time by

the Reserve Bank of India to further the cause of financial inclusion. NABARD introduced the Joint Liability Group (JLG) model, an extension of the earlier SHG model for reaching out to tenant farmers and share-croppers with access to credit.

9. Agricultural Debt Waiver and Debt Relief Scheme (ADWDRS), 2008 announced by the Union Government involved waiving institutional debt for small farmers and a one-time settlement opportunity with 25 per cent rebate to other farmers. This massive write-off of agricultural loans involving ₹525.16 billion was envisaged to provide relief to the persistent problem of farmers' indebtedness and alleviate the financial pressure faced by the farmers.
10. In 2009-10, the Government introduced the prompt repayment incentive (PRI) of 3 per cent under the ISS to bring down the effective rate of interest to 4 per cent to those farmers who repaid their loans on or before the due date to inculcate repayment habits.
11. In July 2012, the Priority Sector Lending (PSL) guidelines were revised by the Reserve Bank to widen the eligible activities. Again in April 2015, the guidelines were revamped based on the recommendations of the Internal Working Group (IWG). The salient features of the revamped PSL guidelines relating to agricultural sector are:
  - a. The distinction between direct and indirect agricultural credit was dispensed with.
  - b. A sub-target of 8 per cent of ANBC or Credit Equivalent Amount of Off-Balance Sheet Exposure, whichever is higher, was prescribed for small and marginal farmers.
  - c. Focus shifted from 'credit in agriculture' to 'credit for agriculture'.

## **2.5 Measures to Improve the Reach of Institutional Credit**

In order to bring the excluded agricultural households into the fold of institutional credit in a structured and sustainable manner, there is a need to build an enabling ecosystem with respect to policy interventions, institutional innovations and digital technologies. The enabling ecosystem would include digitisation of land records, reforming of land leasing framework, creating a national level agency to build consensus among states and the Centre with regard to agriculture-related policy reforms and innovative digital solutions to bridge the information gap between the banks and farmers.

### **1. Digitisation of Land Records**

- a. GOI started the Computerisation of Land Records Scheme to digitise all land records in 1988-89. Thereafter, in August 2008, the Digital India Land Record Modernisation Programme (DILRMP) was launched by Government of India, with the aim to minimise scope of land or property disputes and enhance transparency in the land records.

- b. The status of CLR, in terms of percentage completion, across states is shown in Table

**Status of CLR for states and Union Territories**

CLR more than or equal to 90%	Andaman & Nicobar, Andhra Pradesh, Chhattisgarh, Dadra & Nagar Haveli, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Lakshadweep, Madhya Pradesh, Maharashtra, NCT of Delhi, Odisha, Puducherry, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttar Pradesh and West Bengal
CLR from 50% upto 90%	Assam, Bihar, Daman & Diu, Goa, Uttarakhand
CLR less than 50%	Arunachal Pradesh, Chandigarh, Jammu and Kashmir, Kerala, Manipur, Meghalaya, Mizoram, Nagaland

- c. Digitisation of land records has the potential to address various issues relating to agricultural credit, provided banks are given access to view land records online and/or they are given the facility to create charge online over land. This will help in reducing the instances of double or multiple financing on the same piece of land.

**2. Land Leasing Framework**

- a. Most states ban or restrict leasing of agricultural land leading to informal or concealed tenancy. As per T. Haque Committee (NSSO 2012-13), the tenancy in the country is around 10 per cent. As these tenant farmers lack documentary evidence as well as suffer from fear of eviction, they do not have the incentive to invest in agricultural land, leading to low productivity. Hence, there is a need to reform the land leasing framework by state governments by adopting policies like the Model Land Leasing Act proposed by NITI Aayog and Andhra Pradesh Land Licensed Cultivators Act, 2011.
- b. The Model Land Leasing Act recommends that all lease agreements be made formal and farmers cultivating on leased lands be given access to benefits including farm credit. The unified state of Andhra Pradesh was the pioneer to undertake reforms for tenant farmers in the form of Land Licensed Cultivators’ Act, 2011 under which Loan Eligibility Cards (LECs) are being issued to tenant farmers, making it possible for them to approach banks for credit. The Certificates of Cultivations (CoC) are issued under executive direction.

## **2.6 Federal Institution in Agriculture**

The Union Government in the past has suggested several reforms in the field of agriculture through the Model Agricultural Land Leasing Act, Model Agricultural Produce and Livestock Marketing Act, removing agricultural commodities from Essential Commodities Act, Digitisation of Land Records and e-NAM etc. However, the implementation of such reforms has not been very encouraging as many a times state governments might not be taken on board during the consultation or implementation process to take their concerns into consideration. In order to consult states and build consensus among them over reforms related to agriculture there is need for a federal institution, established on the principle of cooperative federalism, having representation from both Central Government as well as state governments. Such an institution exists in the form of the GST council which has been a success story.

## **2.7 Digital Innovations in Agriculture Sector**

The emergence of farm technologies integrated with robust ICT framework and other farm-related innovations hold tremendous potential to positively impact the growth in the agriculture sector. The technological innovations leverage tools like Internet of Things, Cloud, Big Data, etc. Some of the major developments are discussed below:

- a. E-NAM - a technology-driven unified national level market platform that integrates the physically dispersed markets enabling better price discovery for the farm produce.
- b. Digital technologies such as Remote Sensing and Geo-tagging which helps in crop identification, crop production forecasting, crop acreage and yield estimation, assessment of crop progress and crop damage, soil health, soil mapping, water resource mapping and climate change monitoring.
- c. Weather forecasting companies giving real time weather updates.
- d. Under the Digital India Initiative the GoI provides mandi prices on real time basis through its 'Gramseva: Kisan' app.
- e. Corporates through mobile-based apps are providing farm machinery to farmers on rental basis which saves farmers from long-term investments.
- f. Movable warehouses and cold storages that help farmers to store their produce in a cost-effective manner.
- g. State-of-the-art solar powered products for irrigation which will make farmers less dependent on electricity.

- h. A few banks have launched mobile-based applications to cater to the specific needs of farmers and create an ecosystem for them through which they can purchase products, get weather updates and soil information and apply for loans.

## **2.8 Institutional Agricultural Credit - Agency-wise Share**

1. In order to understand the performance of different agencies in lending to agriculture sector, a comparative analysis has been done showing their share in total agricultural and allied credit outstanding as on March 31, 2017.
2. Scheduled commercial banks contributed the major share (78 – 80 per cent) in agricultural and allied credit. Co-operative institutions also play a significant role in extending agricultural credit and the share of all co-operative banks/institutions (i.e. StCBs, DCCBs and PACS put together) constituted 15-16 per cent. The RRBs contributed the remaining 5 per cent of the agricultural credit.
3. The co-operative banking sector thrives either as three-tier or two-tier structure. The three-tier structure includes StCB, DCCB and PACS, whereas in two-tier structure only StCB and PACS are present. In the three-tier structure, the lower level tiers, i.e. DCCB and PACS extend credit to individual borrowers using their own funds/deposits and claim refinance from the upper tier, i.e. PACS from DCCB/StCB and DCCB from StCB. In the two-tier structure, PACS provide credit to individual borrowers and claim refinance from StCB. In some cases, the StCBs also extend credit to the individuals through its branches across the state.
4. The SCBs are the leading institutions in providing agricultural credit in all the states. The RRBs have significant presence in some states, viz., Bihar (35 per cent), Telangana (15 per cent), Himachal Pradesh (10 per cent) and Uttar Pradesh (10 per cent). Cooperatives have played a significant role in Odisha (46 per cent), Goa (34 per cent), Maharashtra (31 per cent), Chhattisgarh (27 per cent), Madhya Pradesh (27 per cent), Gujarat (22 per cent) and Haryana (20 per cent) in providing agricultural credit. The high share of cooperative banks and RRBs in agricultural credit in these states is on account of their significant presence as compared to commercial bank branches in rural areas.
5. One distinct development in the expansion of rural credit institutions was the advent of NBFC-MFIs (Non-Banking Finance Company - Micro Finance Institutions) and Small Finance Banks.

## **2.9 Regional Disparity in Agricultural Credit**

1. The IWG opined that disparity can be better brought out by analysing states individually instead of analysing region-wise. This is because in many cases, states within the same region are not very similar in various aspects relating to agricultural credit. Moreover, IWG suggested to combine all eight states (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura) under NE States as they have a miniscule share in the country's overall output as well as loans to agricultural and allied sector. Further, as most of the UTs are predominantly urban areas and do not have significant potential for agriculture and allied activities, it was decided to exclude UTs from the analysis related to regional disparity.
2. This chart shows that some of the states are getting agri-credit higher than their agri-GDP indicating the possibility of diversion of credit for non-agricultural purposes. It also highlights the problem of regional disparity as states falling under central, eastern and north eastern regions are getting very low agri-credit as percentage of their agri-GDP. One way to stimulate the demand for rural credit including agricultural credit is to deepen the credit absorption capacity in these states. RIDF is one such tool available which has the potential to create the necessary credit absorption capacity in the rural areas of these states. RIDF is maintained by NABARD and is mainly deployed for rural projects like irrigation, roads and social sector by way of loans to state governments and state-owned corporations. In this context the performance of RIDF is discussed in the following paragraph.
3. Commercial banks contribute to the corpus of RIDF and other funds administered by DFIs based on their respective PSL shortfall. The chart below shows that the allocation to RIDF has been declining over a period of time from 61 per cent in 2008-09 to 18 per cent in 2019-20. Considering its significance, there is a need to increase the share of RIDF allocation.
4. The region-wise analysis of RIDF shows that the combined share of central, eastern and north-eastern region was approximately 41 per cent in terms of sanction/disbursement under RIDF. NABARD has been striving to increase the allocation to these regions and the same is reflected with 51 per cent of RIDF allocation in the ongoing tranches.

## **2.10 Improving KCC scheme - Scale of Finance**

1. RBI guidelines on KCC scheme prescribe that the crop-wise Scale of Finance (SoF) as decided by District Level Technical Committee (DLTC) should be used to arrive at the short term limit for the crop loan. The guidelines on SoF are issued by NABARD. As per the guidelines, the district is the unit for determining the crop-wise scale of finance per unit of area because of different agro-climatic characteristics and separate SoF are to be fixed for

irrigated and unirrigated areas. DCCBs are the convenors of DTLC and they play a major role in fixing the SoF.

2. A short study was conducted to understand the effectiveness of the scale of finance and to ascertain whether it is realistic keeping in view the cost of cultivation and expected price to be realised. The study was carried out in states of Punjab, Haryana, Uttar Pradesh, Madhya Pradesh, Maharashtra, Gujarat, Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, Kerala, Bihar, West Bengal and Assam. In each state, five districts with the highest credit off-take were selected and rural branches with significant crop loans were visited on random sample basis.
3. The findings of the study indicated that different approaches were used to arrive at the scale of finance for sanctioning of crop loans. Complaints were received in the past from farmers regarding crop loans not being in tandem with the cost of cultivation. This may be on account of lower SoF fixed by the DLTC. Further, there are issues of huge variation in SoF for a single crop across districts within the same state. This may be on account of differences in geographies, climatic conditions, farming practices, usage of machines, irrigation facilities and labour charges etc. This leads to difficulty in implementation and monitoring by banks with regard to adherence by their branches. Hence, there is a need to have a uniformity and transparency in scale of finance.
4. DCCBs are the convenors of DTLC and they play a major role in fixing the SoF. However, they lack the resources and technical capabilities to carry out such exercises which need a more scientific approach. Moreover, as the financial health of most of the DCCBs is not sound, they fix the SoF at a lower level. The banks are required to follow the SoF fixed by DLTC, though they have the flexibility to have a higher SoF. Consequently, this leads to further variations in SoF for a crop within the same district. This issue can be addressed by assigning the responsibility of fixing the SoF for crops to SLBC at the state level which is justifiable as banks have emerged as the main purveyors of credit to the farming community.
5. The benefits of the KCC have been recently extended to working capital limits for animal husbandry farmers and fisheries. Lending for AH&F has not taken off on account of delay in fixing the district-wise SoF in states. In allied activities there would not be much variation in terms of unit cost of livestock, shed and expenditure towards feed, maintenance etc. Hence, a pan-India SoF would be feasible for allied activities and will also make it easier for banks to monitor the credit flow.

## **2.11 Priority Sector Lending Certificate**



1. Priority Sector Lending Certificate (PSLC) instrument was introduced on the recommendations of the Internal Working Group (IWG) to review PSL in April 2016. The Reserve Bank provides the platform to enable trading in the certificates through its core banking solution portal (e-Kuber). All scheduled commercial banks (including RRBs), urban co-operative banks, small finance banks and local area banks are eligible to participate in trading. There are four kinds of PSLCs: Agriculture, Small and Marginal farmers (SMF), Micro Enterprises and General which can be bought and sold via the said platform. The total trading volume of PSLCs grew from ₹498 billion in 2016-17 to ₹1842 billion in 2017-18 and further to ₹3,274.3 billion in 2018-19 recording a Y-o-Y growth of 78 per cent in 2018-19 as compared to 2017-18. Among the four PSLC categories, the highest trading was recorded in the case of PSLC-General and PSLC-SMF, with the transaction volumes at ₹1,324.8 billion and ₹1,125.0 billion, respectively, in 2018-19.
2. The basic philosophy behind the introduction of PSLC is to support the comparative advantage of different banks in their respective areas of specialisation which brings in efficiencies and results in optimal allocation of lendable resources. The banks thus have the incentive in lending to different categories of the priority sector over and above the PSL targets and sub-targets and issue PSLCs against the surplus loans, thereby enhancing lending to these sectors. For instance, a bank with expertise in lending to agriculture can increase its lending thereby creating a surplus and get benefit by selling its surplus through selling PSLCs. The premium income earned makes achieving a surplus in PSL categories a lucrative avenue for banks.

## **2.12 Impact of Farm Loan Waiver**

Farm loan waivers, though not a recent phenomenon, have seen an unprecedented increase since 2014-15 driven by state governments. From a macro-economic perspective, the policy of farm loan waivers is grounded in the rationale of alleviating the debt overhang of beneficiaries thus enabling them to undertake productive investment and boost real economic activity. However, in reality it often undermines the credit culture and impacts the state finances adversely, which in turn harms the farmers' interests in the medium to long term.

### **2.12.1 Genesis of Farm Loan Waivers**

1. The first major program on farm loan waiver, viz., Agriculture and Rural Debt Relief Scheme, 1990 (ARDRS), was undertaken in 1990 at the nationwide level, followed by

another nationwide loan waiver in 2008, viz., Agricultural Debt Waiver and Debt Relief Scheme, 2008 (ADWDRS). The ARDRS program, which came into force on May 15, 1990 covered short-term loans and overdue instalments of term loans outstanding to Public Sector Banks (PSBs) and Regional Rural Banks (RRBs) as on October 02, 1989 (cut-off date). The maximum relief amount under the program was ₹10,000 per farmer and there was no differential treatment for farmers based on the size of their landholding. The features of the 2008 ADWDRS program varied significantly from those of the 1990 ARDRS program. The ADWDRS program was broader in its coverage of institutions - it covered Scheduled Commercial Banks (SCBs), RRBs, Co-operative Credit Institutions (both urban and rural) and Local Area Banks. The program defined eligible amount of waiver as outstanding direct agriculture loans (including both short-term and investment loans) that were disbursed between March 31, 1997 and March 31, 2007, were overdue on December 31, 2007 and continued to remain unpaid as on February 29, 2008; there was no upper limit on the eligible amount for waiver. Perhaps the most significant feature in 2008 ADWDRS program was the differential treatment of farmers for waiver eligibility based on their landholding size. The program targeted higher relief for small and marginal farms (landholding upto five acres) vis-à-vis other farmers. Small and marginal farmers under the program received a full waiver on their eligible amount while other farmers received 25 per cent waiver on eligible amount conditional on payment of the remainder 75 per cent.

2. The instances and scale of farm loan waivers have seen an unprecedented increase since 2014-15. This surge in loan waivers is driven by state governments - 10 states have announced loan waivers aggregating ₹2.4 trillion (1.4 per cent of 2016-17 GDP at current prices) since 2014-15. This is significantly higher than the two-nationwide loan waiver programmes - ₹100 billion waiver programme in 1990 (₹506 billion at 2016-17 prices using the GDP deflator) and ₹525 billion programme in 2007-08 (₹812 billion at 2016-17 prices using the GDP deflator).
3. The features of loan waivers undertaken by state governments since 2014 are detailed in Table below. Broadly, there is a higher focus on co-operative credit institutions in state-level debt waiver programs. Most programs cover short-term crop loans and prescribe an upper limit on the amount of relief granted.

<b>Table: Comparison of state level loan waivers since 2014</b>
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State (Amount and announcement year)	Institutions covered	Types of loan covered	Farmer category covered	Cut-off date	Limit per farmer (₹)
Andhra Pradesh (₹240 billion; 2014-15)	SCBs, RRBs, Rural Co-operative Credit Institutions (RCCI)	Short-term crop loans, including those converted in medium-term loans due to calamities	All farmers	March 31, 2014	1,50,000
Telangana (₹170 billion; 2014-15)	SCBs, RRBs, Co-operative Credit Institutions (urban and rural)	Short-term crop loans, including those converted in medium-term loans due to calamities	All farmers	March 31, 2014	1,00,000
Tamil Nadu (₹52.8 billion; 2016-17)	RCCI	All short-term, medium-term and long-term agricultural loans	Small and marginal farmers	March 31, 2016	No limit
Maharashtra (₹340.2 billion; 2017-18)	SCBs, RRBs, Grameen Banks and District Central Co-operative Banks (DCCBs)	Crop loans and term loans	Small and marginal farmers	June 30, 2016	1,50,000
Uttar Pradesh (₹363.6 billion; 2017-18)	SCBs, RRBs, Co-operative credit societies / banks (excluding Urban co-operative banks)	Short-term crop loans, including those converted in medium-term loans due to calamities	Small and marginal farmers	March 31, 2016	1,00,000
Punjab (₹100 billion; 2017-18)	SCBs and Co-operative Credit Institutions (urban and rural)	Crop loans	Small and marginal farmers	March 31, 2017	2,00,000
Karnataka (₹180 billion; 2017-18)	RCCI	Crop loans	All farmers	June 20, 2017	50,000
Karnataka (₹440 billion; 2018-19)	SCBs, RRBs, Co-operative credit societies / banks (excluding UCBS)	Crop loans	All farmers	For SCBs and RRBs: December 31, 2017 For co-operative institutions: July 10, 2018	For SCBs and RRBs: 2,00,000 For co-operative institutions: 1,00,000
Rajasthan (₹180 billion; 2018-19)	Rural co-operative institutions and primary land development banks	Crop loans	All farmers	September 30, 2017	For small and marginal farmers: 50,000 For other farmers: proportionate basis linked to prescribed landholding of small farmers, subject to limit of Rs. 50,000
Madhya Pradesh (₹365 billion; 2018-19)	SCBs, RRBs, Co-operative banks	Crop loans	All farmers	December 12, 2018	2,00,000
Chhattisgarh (₹61 billion; 2018-19)	SCBs, RRBs, Co-operative banks	Crop loans	All farmers	December 12, 2018	2,00,000

## 2.13 Policy Alternatives

While the risk to farmers income, viz., nature's risk as well as market risk, materialise from time to time causing distress to the agrarian community, loan waivers, which often happen at the time of elections, are not the panacea to address the underlying risks. In fact they destroy the credit culture which may harm the farmers' interest in the medium to long term and also squeeze the fiscal space of governments to increase productive investment in agriculture infrastructure. Cognizant of the need to address the long-term challenges of agriculture, various policy instruments like crop insurance, income support scheme, ECA, APMC reforms and e-NAM, etc have been undertaken at various levels of the government.

## 2.14 National Livestock Mission

National Livestock Mission is an initiative of the Ministry of Agriculture and Farmers' Welfare. The mission, which commenced from 2014-15, has the objective of sustainable development of the livestock sector.

NABARD is the subsidy channelizing agency for following schemes, under Entrepreneurship Development & Employment Generation (EDEG) component of National Livestock Mission.

- Poultry Venture Capital Fund (PVCF)
- Integrated Development of Small Ruminants and Rabbit (IDSRR)
- Pig Development (PD)
- Salvaging and Rearing of Male Buffalo Calves (SRMBC)
- Effective Animal Waste Management
- Construction of Storage Facility for Feed and Fodder

#### **2.14.1 List of Beneficiaries**

1. Farmers, Individuals Entrepreneurs
2. NGOs
3. Companies
4. Cooperatives
5. Groups of organized and unorganized sector which include Self- Help Groups (SHGs) and Joint Liability Groups (JLGs)

## **Rural Livestock Management and Production**

### **2.15 Definition and Introduction**

1. Economics is the science which treats of wealth. By. F.A.Walker
2. Economics is the science which treats of those social phenomena that are due to the wealth-getting and wealth-using activity of man. By. Ely
3. Economics is a study of men's actions in the ordinary business of life; it enquires how he gets his income and how he used it. Thus it is on one side a study of wealth and on the other and more important side, a part of the study of man. By. Dr.Alfred Marshall
4. Economics is the study of causes of material welfare. By. Cannan

5. Economics is the study of the general methods by which men cooperate to meet their material needs. By. Beveridge

6. Economics studies human behaviour as a relationship between ends and scarce means which have alternative uses. By Robbins Economics deals with that part of social welfare that can be brought directly or indirectly into relation with the measuring rod of money” By Pigou

The students rough idea about Livestock Economics with example.

**Limited Means and Unlimited Ends-** Atul has just pass out B.V. Sc. from college of veterinary science & A.H. Jabalpur and he want open a dairy farm. Suppose he got Rs. 5,00,000/ as a loan from the bank. With this limited sum at his disposal, he has to meet all his needs for new dairy farm land, labour, capital (machinery), and management. He has to pay for good located land, livestock, office building, cattle shed, calf pen hutment, and store, supervisor and labour quarters. In equipments he has to pay for chaff cutter, hand pump, milking pails, etc. He has also pay for dairy farm manager, storekeeper, and driver cum mechanic, milk recorder, labour, fodder concentrates, medicine, bank loan, water and electricity charges etc. In fact, he wants to do or buy so many things. But the amount of money that he has limited whereas his wants as we have seen, are unlimited. Livestock Economics helps him in such situation. It will help him to derive maximum satisfaction from the limited amount of money he has.

**Choosing between Ends-** Economics tells us how a person tries to satisfy his unlimited wants with his limited means; in other words, how to use scarce goods that he has to his best advantage or how to economies. He must, therefore, choose what to buy and what not to buy. This is Economics. Economics is a science of choice when faced with scarce means and unlimited ends.

**2.16 Deriving Maximum Satisfaction-** In short, Economics teaches us to make the best use of our limited resources. It tells us how the scarce means at our disposal can be put to several alternative uses so as to derive the maximum benefit out of them. It thus merely means prudence or wisdom in the use of things. We should use them in such a manner as to get the greatest amount of satisfaction possible. Economics tells us how to do it.

**2.17 Income and Employment-** Recent thinking in Economics is that besides studying the behaviour of an individual consumer or producer deriving maximum benefit from the use of his limited resources, Economics is also concerned with the levels of income and employment in a country as well as causes of their fluctuation. Its study is thus intended to promote economic stability.

**2.18 Economic Development-** In respect of under-developed economies, Economics concerns itself with the study of economic growth. The theory of economic growth and the theory of income and employment are the two recent additions to the study of Economics. Thus, Economics is a very wide subject. It concerns itself not only with the behaviour of individual consumers and individual producers or firms, but also with industries, national income and economic growth.

### **2.19 Divisions of Economics**

**Traditional Approach:** As already pointed out, according to the old view, the study of Economics is divided into four main departments or divisions, viz., Consumption, Production, Exchange, and Distribution.

**Consumption-** we study the nature of human wants as well as the principles governing their satisfaction. The law of diminishing marginal utility, law of substitution, the law of family expenditure and consumer's surplus are of special importance. We also study the nature of demand, whether it is elastic or inelastic, as well as the law of demand.

**Production-** we study how man makes efforts to satisfy his wants by producing wealth. In particular, we see how the four agents of production, viz., land, labour, capital and organisation, co-operate and combine in the work of production. We study each of these agents, their importance and the conditions of their efficiency.

**Exchange-** In the third department of Economics, viz., Exchange we discuss how in the various market forms buying and selling are done and how prices are determined. This happens through the interaction of the forces of demand and supply.

**Distribution-**The fourth department, Distribution is devoted to the study of the respective shares that go to the four agents-land, labour, capital and organization. These shares take the form respectively of rent, wages, interest and profit. In Distribution, we study how the share of each agent of production is determined. It is usual to divide Economics into these four departments only. But in addition to these, we have to study also the problems of Public Finance. Here we discuss how governments get money and how they spend it. Thus, it involves a consideration of taxation and allied questions.

**Modern Approach:** As has been mentioned earlier, it is only an old approach to divide Economics into these four divisions. The modern approach is different. The study of Economics is now usually divided into two parts: (a) Income Theory or **Macro Economics**; and (b) Price Theory or **Micro**

**Economics- Micro-Economics**, we study the determination of prices. We no longer divide the study of Economics into Consumption, Production, Exchange and Distribution. They are all covered by price theory. We shall see that prices are determined by the interaction of demand and supply. The theory of demand covers consumption and supply covers production. According to the old arrangement, in exchange we studied commodity prices and in distribution we studied factor prices, i.e., rent, wages, interest and profit. But in price theory we study both product prices (i.e., exchange) and factor prices (i.e., distribution) Thus, all the old four divisions of Economics are covered in what we now call Micro-economics or Price Theory. We study small individual parts of the economy. For instance, we study the individual consumer's behaviour or that of an individual firm or what happens in any particular industry. In the price analysis, we study the determination of the price of an individual commodity or of a particular factor of production, i.e., its reward. In the case of demand and supply, we study the demand and supply of an individual commodity or a factor. We study the income of an individual or of a firm in an industry, and not the national income.

**Macro Economics**- It studies aggregates or average of the entire economy, such as national income, output and employment, total consumption, total savings and investment, aggregate demand and aggregate supply, and so on. In this approach full employment is not assumed. We study the determinants of full employment and see how the fullest possible employment can be attained. The macro-approach is essential, for what is true of the parts may not be true of the whole. After all, the problem of the aggregate is not-merely a matter of adding or multiplying what happens in respect .of the various individual parts of the economy.

**Nature:** The essential idea in the definition almost universally accepted today is that it. tells us about such activities of a man when he is making the best use of his limited resources in time or money or any other form of wealth for satisfying his wants which are unlimited. Now in the present chapter we shall spell out its nature and subject-matter and discuss its scope. We shall also study economic laws, i.e., the general principles underlying economic behaviour. Also, we shall see how Economics is related to other social sciences and study its utility or importance. Besides, before we study the subject proper, we shall indicate how the subject-matter of Economics is usually divided.

**Scope of Economics:** While discussing the subject-matter and definition of Economics, we have said something about the scope of Economics too. But there are a few more things which we have to discuss in considering the scope of Economics. 'Scope' means the sphere of study. We have to consider what Economics studies and what lies beyond it. The scope of Economics will be brought out by discussing the following: (a) The subject-matter of Economics. (b) Economics is a Social

Science. (c) Whether Economics is a Science or an Art? (d) If Economics is a science, whether it is a positive science or a normative science? We have already discussed at length the subject-matter of Economics; hence we now need consider the other four of the above aspects.

**Subject-matter of Economics:** Economics has a subject-matter of its own. We can know something about the subject matter of Economics from its definitions given above. The student already knows about Mathematics, History and Geography. But Economics is new to him and he cannot say what it is about. We can say that Economics studies man's life and work, not the whole of it, but only one aspect of it. It does not study how a person is born. How, he grows up and dies. This is the work of another science named Biology. Economics does not study how human body is made up and how it functions. That is the subject of Physiology. Economics does not tell us how a man thinks. It is Psychology which studies man's mind. Economics does not study the human organization like the State. This is the subject of Political Science Economics only tells us how a man utilises his limited resources for the satisfaction of his unlimited wants. A man has a limited amount of money and time; but his wants are unlimited. He must so spend the money and time he has that he derives maximum satisfaction. This is the subject-matter of Economics

**Economic Activities-** If we look around, we see the farmer tilling his field, the workman working in the factory, the clerk at his desk, the doctor attending to his patients, the teacher teaching his students and so on they are all engaged in what is called economic activity. They earn money to satisfy their wants. It is with this part of man's life that Economics deals. We may say that when a man is engaged in an economic activity he is busy earning money. But he does not want money for its own sake. He needs it to buy things which satisfy his wants. The purpose of all economic activity is the desire to purchase goods to satisfy human wants. Neither goods nor money is an end in itself. They are needed for the satisfaction of human wants and to promote human welfare. A man wants food, clothes and shelter. To get these things he must have money. For getting money, he must work or make an effort. Effort leads to satisfaction. Thus, Wants-Efforts Satisfaction sums up the subject-matter of Economics.

In a primitive society, the connection, between wants, efforts and satisfaction is close and direct. A primitive man feels hungry he picks up some fruit, eats it, and is satisfied. But in a modern society things are not so simple and straight. Here a man produces what he does not consume and consumes that he does not produce. The shoe-maker produces shoes, but he cannot use them all by himself. He sells them for money with which he buys the things he needs. This work of selling what you do not want and buying what you want is called exchange. Today the process of exchange comes in



between wants, efforts and satisfaction. Nowadays most of the things we need are made in factories. To make them the worker gives his labour, the landlord his land, the capitalist his capital, while the businessman organizes the work of all these. They all get a reward in money. The labourer earns wages, the landlord gets rent, and the capitalist gets interest, while the entrepreneur's reward is profit. Economics studies how these incomes-wages, rent, interest, and profits-are determined. The process is called Distribution. Like Exchange, Distribution also comes in between efforts and satisfaction in a modern society. Thus, we can say that the subject-matter of Economics is Consumption (i.e., the satisfaction of wants), Production (i.e., producing things or creating utilities or making an effort to satisfy our wants), Exchange and its mechanism (i.e., money, credit and banking, etc.) and finally Distribution (i.e., sharing of all that is produced in the country among workers, landlords, capitalists and organizers). In addition, Economics also studies Public Finance. Thus it is indeed a very wide subject.

**Modern View:** The view that is widely accepted today is far more comprehensive. The traditional subject matter explained above is now regarded as constituting only one part of Economics, viz., Price Theory or also called Micro-Economics. According to modern approach, the scope or the subject-matter of Economics is not only the price theory but also the study of the economy as a whole. We study, for instance, how the income of an economy is generated and how the level of a country's income and employment is determined. In other words, we also study the factors that determine a country's national income, savings, investment, output, employment, general price level, etc. Such a study of the economy as a whole is called Macro-Economics. Hence we study both micro-economics and macro-economics. More recently, economists have begun to pay special attention to how an economy grows, i.e., how the under-developed countries grow into developed economies and the developed economies grow still further. Economics thus also includes study of economic growth.

**Conclusion-** In sum, the subject-matter of Economics, according to the view held today, includes price theory (or micro-economics), income and employment theory (or macroeconomics) and growth theory. Thus, broadly speaking Economics may be described as a study of the economic system under which men live and work. It deals with decisions regarding the commodities and services to be produced in the economy, how to produce them most economically and how to provide for the growth of the economy.

## **2.20 Economics-a Social Science**

Economics studies human beings. But it does not study them as isolated individuals living aloof in jungles or in mountain caves. Rather, it studies man living in organized society, exchanging his goods for those of others, influencing them by his actions and being influenced by them in turn. He depends on them, and they on him. Economics is thus a social science and not one dealing with individual isolated human beings. Interest has now almost completely shifted to the economy as a whole, how it grows and develops, the factors that hinder its growth and the measures that would help or accelerate it.

**Positive Science or Normative Science?** A positive science explains the 'why' and 'wherefore' of things, i.e., their causes and effects. A normative science, on the other hand, discusses the rightness or wrongness of things, Economists hold different views on this point. Some economists think that Economics is only a positive science and as such explains why things are as they are. It is neutral as regards ends. Others think that it is a normative science and tells us as the things ought to be. Our view is that Economics is both a positive and a normative science. It not only tells us why certain things happen, it also says whether it is the right thing to happen. For example, we know that a few people in the world are very rich while the masses are very poor. Economics should explain not only the causes of this unequal distribution of wealth, but it should also say whether this is good or bad. It might well say that wealth ought to be fairly distributed. Further, it should suggest the methods of doing it.

### **2.21 A science or an art?**

When a student joins a college, he has to choose between two groups of subjects-Science subjects and Arts subjects. In the former group are included Physics, Chemistry, and Biology, and in the latter History, Civics, Economics, Philosophy, Sanskrit, etc. According to this classification, Economics falls in the Arts group. But this is not a sound classification, and does not help us in deciding whether Economics is a science or an art. Let us first understand what the terms "science" and "art" really mean. A science is a systematized body of knowledge. A. branch of knowledge systematized when relevant facts have been collected and analysed in a manner that we can "trace the effects back to their causes and project causes forward to their effects." Than it is called a science In other words, when laws have been discovered explaining facts, it becomes a science. Facts are like beads. But mere beads do not make a necklace. When a thread runs through the beads, it becomes a necklace. The laws or general principles are like this thread and govern the facts of that science. A science lays down general principles which help to explain things and guide us. The knowledge of Economics has advanced a great deal. It has reached a stage when its facts have been collected and carefully analysed, and 'laws' or general principles explaining facts have been laid

down. Thus, the study of Economics has become so thoroughly systematized that it is entitled to be called a science. But Economics is also an art. An 'art' lays down precepts or formulae to guide people who want to achieve a certain aim. The aim might be the removal of poverty from a country, or the production of more wheat from an acre of land. Many English economists consider that Economics is a pure science and not an art. They claim that its function is merely to explore and explain and not to help in the solution of practical problems. Yet many others are of the opinion that Economics is also an art. Economics does undoubtedly help us in solving many practical problems of the day. It is not a mere theory; it has great practical use. It is both light-giving and fruit-bearing. Hence, **Economics is both a science and an art.**

## **2.22 Want, goods, wealth, utility, price, value, assets, capital, money, income etc.**

### **Basic concepts- Basic Terms**

We propose to explain some terms which are frequently used in Economics. This is essential not only for clear thinking but also for a correct understanding of the language used in books on Economics. The terms used in Economics are also used in the ordinary speech. But in Economics they are used in a sense different from that in which they are used in ordinary speech. We shall make it clear here in what sense they are used in Economics.

**Want-** 'Man is a bundle, of desires' His wants are infinite in variety and number. Some, of his wants are, organic and natural. He must have some food to live, some clothing to cover his body and some sort, of shelter to protect himself against the inclemencies, of weather, and also against his enemies. Without these things man's life would be impossible. But a civilised man is not satisfied with bare necessities, of life. Even when the problem, of bare existence has been solved, the struggle, of life remains as keen as ever. The struggle now is for the comforts and joys, of life. As man becomes more civilised, his wants multiply. He wants better food, fashionable clothing, comfortable lodging, and so on. All people do not have the same wants. Wants vary from individual to individual. They are relative to, one's social and economic position. They are also the outcome, of, one's education, temperament and tastes. The modern man is the product, of a long process, of evolution which is reflected in his endless and ever-growing wants.

**Characteristics of Human Wants** A careful study, of the nature of human wants shows that they have some well marked characteristics. The important ones among these characteristics are below:

1. Wants are unlimited- When, one want is satisfied, another comes up to take its place. The never-ending cycle of wants goes on and on. Man's mind is so made that he is never completely satisfied.

2. Wants are complementary- If we want to write a letter, we must buy a pen as well as ink and paper. The pen alone is not enough
3. Wants are competitive- Not only are our wants complementary, they are also competitive. One commodity competes with another for our choice.
4. Some wants are both complementary and competitive- Machinery competes with labour. A manufacturer can, to some extent, substitute one for the other. But they also go together. Both of them are used in factories. Thus, human wants not only compete, they also complement each other.
5. Wants are alternative- There are several ways of satisfying a particular want. If we feel thirsty, we can have cold drink, 'sharbat' or 'lassi' in summer, and tea coffee or hot milk in winter.
6. Wants vary with time, place and person- Wants are not always the same, nor the same with everyone. Different people want different things and the same man wants different things at different times and in different places.
7. Wants vary in urgency and intensity- All wants are not equally urgent and intense. Some wants are more urgent and intense than others. These are generally satisfied first, while others are postponed.
8. Wants multiply with civilization- As civilisation spreads among peoples their wants also go on increasing. That is why people living in urban areas have more wants than people inhabiting villages.
9. Wants recur- Most of the human wants are of a recurring nature. This applies to most of our routine expenditure, especially on food.
10. Wants change into habits- If a particular want is regularly satisfied, a person becomes used to it and it grows into a habit.
11. Wants are influenced by income, salesmanship and advertisement- We are often induced to buy particular brands by persuasive salesmen or clever advertisement or increased income even though better alternatives may be available.
12. Wants are the result of custom or convention- Custom still rules the world. All of us, whether living in villages or towns, are slaves of custom, more or less.

13. Present wants are more important than future wants- It is a human instinct to regard the present wants as being more important than the future wants.

## **Goods**

### **Meaning of goods:**

We know that human wants are the starting point of all economic activity. Man has wants which he must satisfy. There are two things with which he can satisfy these wants-goods and services. Goods mean the commodities that we use, and services refer to the work that a person may do. Services are not something tangible or concrete. The help of a tutor, the advice of a lawyer or a doctor, the work done by railways or domestic servants-these are all services. Goods or commodities, on the other hand, are almost always concrete, material and tangible, .e.g., land, houses, furniture, etc. Goods and services are used to satisfy human wants. Anything that can satisfy a human want is called a 'goods' in Economics.

### **Kinds of Goods**

#### **Economic Goods and Free Goods**

The most important classification of goods is as free goods and economic goods.

**Free goods-** are those goods that exist in such plenty that you can have as much of them as you like without any payment, e.g., air, sunshine, etc. They are free gifts of nature. Man has not made them nor has man to pay for them to get them.

**Economic goods-** on the other hand, are those goods which are scarce and can be had only on payment. Most of the things that a man needs to satisfy his wants fall in this group. They are limited in quantity and are man-made things. Payment has to be made in order to get them.

In Economics, we are concerned only with economic goods, for only in their case the question of valuation or payment arises. Economic goods mean wealth and it is with wealth that Economics deals. Thus, there would have been no science of Economics if all goods had been free goods.

#### **This distinction between economic goods and free goods is not permanent**

A good may be a free good today and become an economic good tomorrow or the same thing may be free good under certain conditions and an economic good under others. For instance, air is not a free good in a deep mine; water in a city is an economic good and not a free good, because price has to be paid for it. As population increases, goods which were free before become economic goods (i.e., goods for which a price is paid) later. Increase in economic goods is synonymous with increase in wealth. But that does not necessarily mean that the people are now better off. This is so

because many things, like fuel and water, for which the primitive man had to pay nothing, the modern man cannot get without payment. Even those things which were free goods before have been included in the category of economic goods or wealth and have become scarce. And human welfare is not increased by scarcity. Hence increase in economic goods alone does not necessarily mean increase in economic welfare, because both economic goods and free goods contribute to human welfare.

### **Consumption Goods and Capital Goods-**

**Goods can also be classified as Consumption goods and capital goods thus:**

**Consumption Goods-** are those goods which yield satisfaction directly. They are used by the consumers to satisfy their wants directly, e.g., food, clothing, pen, ink, etc. They are also called Goods of the First Order. **Capital Goods-** are those goods which help us to produce other goods, e.g., tools, machines, etc. They are, also called. Producers' goods or goods of the second order. They satisfy our wants only indirectly, because they produce goods which in turn satisfy our wants directly.

**Intermediate Goods-** In between the consumption goods and capital goods are the intermediate goods. They are the raw materials used in the production of the final or consumption goods. For instance, in the making of cloth or the clothes that we wear (i.e. the consumption), we need capital goods like textile machinery in a big factory or a handloom in a cottage industry. But we also need cotton or silk or some synthetic fibers of which the cloth is made. This is the intermediate good.

**Material and Non-Material Goods-** Another classification of goods is between material and non-material goods. The examples of material goods are land; buildings, furniture, cash, books, etc.

**Non-material goods are various kinds of services-** They are not tangible. But some of them are scarce and can be transferred. The goodwill of a business falls in this category. It can be bought and sold.

**Transferable and Non-transferable Goods-** Most material goods can change their ownership. In such cases, a bodily transfer takes place and the goods may be moved from one place to another. In some cases, however, actual physical transfer cannot take place e.g., in the case of land. In this case, no actual movement is possible, only ownership is changed and this makes them transferable. Hence, goods are called transferable, whether they are physically transferred or their mere ownerships are transferred.

**Non-transferable goods-** Like skill, ability, intelligence, etc. which is personal qualities cannot be transferred-only then service can be used by others.

**Personal and impersonal goods-** Personal goods refer to the personal qualities of a person, e.g., his ability and skill. They are non-material and exist inside him. They are, therefore, also called Internal goods. They are what he is and not what he has. Impersonal goods are those that are not personal. They are external and lay outside a person. They are, therefore, also called External goods. They are what he has, e.g., land, houses etc.

**Private and Public Goods-** Private goods are the property of private individuals. e. g. land or buildings owned by them exclusively and not shared with others.

**Public goods-** are those which are common to all and are owned by society collectively e.g., a town hall, a college, or a hospital.

**Necessaries Comforts and Luxuries-** Goods can also be classified as necessaries, comforts and luxuries. From the above classification, it is clear that the same 'good' can fall in several categories. Land, for instance, is a material good, it is transferable and may also be a private or a public good.

## **Wealth**

### **Meaning of Wealth**

Wealth is another term used in Economics which requires clear understanding. The term 'Wealth' causes a lot of confusion in the mind of a beginner in the study of Economics. This is due to the fact that 'Wealth' in Economics is used in a sense different from its use in the ordinary speech. In ordinary language, 'Wealth' conveys an idea of prosperity and abundance; it means riches, property, etc. A man of wealth, as ordinarily understood, is a rich man, i.e., one who is prosperous. But in Economics every man, even the poorest of the poor, possesses some wealth, as we shall see presently. Further, in the ordinary speech, by 'Wealth' people mean money. But in Economics money is not the only form of wealth; anything which has value is called wealth in Economics.

In Economics the term 'Wealth' is synonymous with economic goods. Economic goods are scarce and command a price in the market.

## **Utility**

### **Meaning of Utility**

**This want-satisfying quality in a good is called Utility.** Hence utility means the power to satisfy a human want. In order to find out whether a good possesses utility or not, we have simply to ask ourselves the question: 'Does it satisfy a human want? If so, it has utility, otherwise not. If a person is prepared to pay for it, it is clear that he thinks that it will satisfy his want. For him such a commodity will possess utility. Utility is that quality in a commodity by virtue of which it is capable

of satisfying a human want. Air, water, etc. (free goods) and food, clothes, land, house, cash (economic goods) satisfy people's wants, and as such they possess utility.

### **Forms of Utility**

The main forms of utility are:

**(a) Form Utility-** By changing the form of an article, we can give it greater utility, e.g., the transformation of a log of wood into a piece of furniture. This is called Form Utility.

**(b) Place Utility-** Utility can also be increased by transporting a good from one place to another. When timber is brought to the market, it comes to have much greater utility than it had in the forest. That is Place Utility.

**(c) Time Utility-** By storing a commodity and selling it at a time of scarcity, we can give it greater utility. This is Time Utility.

### **Price**

#### **Meaning of Price-**

Value is not the same thing as price. When value is expressed in terms of money, it is called price. In pre-historic times, people did not know the use of money. They exchanged goods for other goods. This system is called barter. In those days, the price of a commodity meant the commodity or commodities for which it could be exchanged. In other words, price and value could be used as synonyms. In modern times, however, goods are ordinarily exchanged for money. Therefore the price of a commodity today means its money-value, i.e., the price it commands in the market. 'Price' expresses value in terms of money.

### **Value**

#### **Meaning of Value**

'Value' is another term which has to be frequently used in Economics, but which creates a lot of confusion. In Economics, we do not use it in the same sense as we use it in our -ordinary speech. We often say education has great value, or that fresh air is very valuable. Here the term 'value' is used in the sense of usefulness. This is value-in-use for which economists use the term 'utility'. In Economics, the term 'value' is not used in this sense, that is, in the sense of value –in use for which we use the term 'utility'.

Economists use the term 'value' in the sense of value-in-exchange. Value of a commodity refers to the goods that can be obtained in exchange for it. We cannot exchange fresh air for anything; its value in economic sense is, therefore, zero even though it is otherwise so indispensable. Rupees, on the other hand, have value because it can be exchanged for something; we may be able to get any



things. The value of a commodity, thus, means the commodities or services that we can get in return for it; it is, in short, its purchasing power in terms of other commodities and services; it is its power of commanding other things in exchange for itself.

Attributes of Value Three qualifications are thus essential for goods before it can have value:

- (a) It must possess utility;
- (b) It must be scarce; and
- (c) It must be transferable or marketable.

All these three qualities are required together. In the absence of any one of these qualities, a good will have no value at all.

## **Assets**

### **Meaning of Assets**

Any item of economic value owned by an individual or corporation, especially that which could be converted to cash. Examples are cash, securities, accounts receivable, inventory, office equipment, real estate, a car, and other property. On a balance sheet, assets are equal to the sum of

- liabilities,
- common stock,
- preferred stock, and
- Retained earnings.

From an accounting perspective, assets are divided into the following categories:

- current assets (cash and other liquid items),
- long-term assets (real estate, plant, equipment),
- prepaid and deferred assets (expenditures for future costs such as insurance, rent, interest), and
- Intangible assets (trademarks, patents, copyrights, goodwill).

## **Capital**

### **Meaning of Capital**

Capital means not only cash used in business but it also includes tools, machinery and appliances used in production.

**Money income-** While income of a person expressed in terms of money per month or year is his money income.

**Real income-** of a person consists of goods and services that he purchases with his money income. Real income depends on prices. It rises inversely with the price level.

**National income-** Income from the point of view of the economy as a whole, i.e., national income may be defined as the aggregate factor income (i.e. earnings of labour and property) which arises from the current production of goods and services by the nation's economy. It includes income produced both inside the country and that earned by its nationals abroad.

**Saving-** A part of the current income is consumed or spent and a part thereof is saved and invested. The excess of income over consumption is the saving made by the people. Saving may be held in the form of cash or a bank balance or in some investment, i.e. in the form of income-yielding assets.

**Investment-** means an addition made to the nation's physical stock of capital like the building of new factories, new machines as well as any addition to the stock of finished goods or goods in the pipelines of production. Investment thus includes additions to inventories as well as

## **2.23 Important features of land, labour, capital and organization**

### **Traditional Classification**

These factors have been called by economists Land, Labour, Capital and **Organisation-** (or Enterprise) respectively. These factors are also called inputs and the production is called output.

**Land-** By land we mean, not merely soil, as is commonly understood, but all the natural resources on land, in water and air available to man. It stands for natural resources.

**Labour-** Labour means not merely the, work of a coolie or of an unskilled labourer but all type of work, mental and manual undertaken for earning an income. Thus, any type or work undertaken for earning an income is called labour in Economic capital.

**Capital-** Capital means not only cash used in business but it also includes tools, machinery and appliances used in production.

**Organisation-** Organisation or enterprise is the work of bringing the above three factors together and making them work harmoniously. This also includes the process of rewarding them for their labour. Thus, it means not merely organising a business but also taking its risk.

The- factors are supplied by landlords, labourers, capitalists and organisers (Or entrepreneurs).

Their respective incomes are called rent, wages, interest and profit.

## **2.24 Theories of demand supply and cost**

### **Demand Theory**

#### **Meaning of Demand**

In ordinary speech, the word demand is used rather loosely, and it is often confused with desire. Desire is the wish to have something or to enjoy a service. But demand implies more than mere desire. It means that the person is willing and able to pay for the object he desires. A beggar's desire to travel by air from Delhi to Bombay has no significance as he cannot pay for it. On the other hand a businessman's desire to go to Mumbai by air is demand, as he is able to pay for it and is willing to do so. Demand thus means desire backed by willingness and ability to pay. Both willingness and ability to pay are essential. If a man is willing to pay but he is unable to pay, his desire will not become demand. In the same manner, if he is able to pay but is not willing to pay, his desire will not be changed into effective demand. In order to change desire into demand it is essential that he should be both willing and able to pay. Besides, demand also signifies a price and a period of time in which demand is to be fulfilled. It is obvious that a person's demand for anything varies with the price at which it is offered. He buys more of it at a lower price and less of it at a higher price. Similarly, his demand varies with the period of time. A family's demand for wheat is much more for a month than for a day. It may be noted that there is no isolated demand. Things are demanded as part of a system. For instance, a student does not want books alone but also books, stationery, etc. We demand things in groups. The standard of living of a person governs the system of demand. The following is therefore a good definition of demand: By demand we mean the various quantities of a given commodity or service which consumers would buy in one market in a given period of time at various prices or at various incomes, or at various prices of related goods.

## **2.25 Substitution effect income effect and price effect**

If the price of a commodity rises relatively to other goods, the consumer will buy less of that commodity and buy more of the other goods in place of these particular goods. This is called Substitution effect in Economics.

Another reason for buying less of goods whose prices have risen is that rise in prices means a loss of purchasing power. It is as it were that the consumer's income has come down. This is called the Income effect.

This is, the consumer has become relatively poor or worse off, since his real income (i.e., income in terms of goods) has fallen. When the price of a commodity falls, more of it is demanded and substituted for other commodities and there is income effect too, for the purchaser feels better off when the price falls and is able to buy more. The combination of the substitution effect and income effect is known as the price effect.

This is the case with normal or ordinary goods. But if the goods are considered inferior, the effect will be opposite, i.e. less will be purchased even if the price falls. But if the substitution effect is greater than the negative income effect, the law of demand will apply even to inferior goods, i.e. demand will extend when price falls.

## **Supply**

### **Meaning of supply**

Supply means the quantities that a seller is willing and able to sell at different prices. It is obvious that if the price goes up, he will offer more for sale. But if the price goes down, he will be reluctant to sell and will offer to sell less. Supply thus varies with price. Just as we cannot speak of demand without reference to price and time, similarly we cannot speak of supply without reference to price and time. Supply is always at a price. The supply of any good may then be defined "as a schedule of respective quantities of the good which people are ready to offer for sale at all possible prices." Just as demand implies willingness and ability to pay, in the same manner the phrase 'ready to offer for sale' in the definition of supply given above implies both willingness and ability to deliver the goods. Like demand, supply is also relative to a person, place and time. It would be different in a different place, at a different time and with a different person. When we say that Mohan is willing to supply 100 liters of milk at Rs. 20 per liter, we mean that he will do it in a particular set of circumstances. Any change in these circumstances will bring about a change in the supply.

### **Inter- related supply**

These are some of the factors which bring about changes in the conditions of supply and increase it or decrease it.

Just as there are cases of inter-related demand, e.g., joint demand and composite demand, similarly there are cases of inter-related supply, viz., joint supply and composite supply.

### **Composite supply**

When there are different sources of supply of a commodity or service, we say that its supply is composed of all these sources. You can get light from electricity, gas, kerosene oil, candles, etc. All these sources go to make up the supply of light. It is a case of composite supply. Whenever there are substitutes or rival sources of supply, the supply is composite. There is competition among them and the most economical source of supply is tapped first. But they also combine and co-operate to satisfy the same need.

## **2.26 Theories of production (law of diminishing return, increasing return, constant return and return to scale) Theory of production**

### **Meaning of Production**

**Form Utility-** A carpenter makes a table. He has produced wealth. But he has not produced wood; it was already there. What, then, has he really done? He has changed the form of wood and given it utility which it did not possess before. He has thus created what is called Form Utility. Conversion of cotton into cloth and sugarcane into sugar are some other examples of form utility. In fact, we can notice this type of utility in all manufacturing industries.

**Place Utility-** If the carpenter sends the table to a big city for sale it will fetch a higher price. Now it acquires additional utility. Its transportation to the city means the creation of Place Utility. Transportation of goods from the places where they are cheap to places where their prices are higher is creating a place utility. It gives the commodity an additional value

**Time Utility-** In case the carpenter keeps the tables with him till tables are in greater demand, he may further add to its price. This storing creates time utility. Fruits and vegetables are kept in cold storages to be sold for consumption in the off season. Wheat may be kept in god owns to be sold when prices rise in the lean season. These are some examples of time utility. It is time which gives them more value. In all these cases, wealth has been produced, but not matter. Just as man cannot destroy matter, so he cannot create matter. In the above cases he has simply created utilities.

**Thus, there are three types of utilities- (i) Form utility, (ii) Place utility and (iii) Time Utility.**

In the examples cited above, utilities have been created and physical goods or wealth produced. However, this may not always be the case. A utility may be created which cannot be sold in the

market. For example, a tube of oxygen will find no market in the plains as there is abundance of it in the air. The provision of such utility-and oxygen has a big utility-cannot be considered production. A thing may possess utility; but it may have no value, e.g; air. Production, in Economics means production of wealth or value, and not merely utility.

Thus, Production is best defined as the creation or addition of value or on wealth. It may consist not only of goods but also of the services such as of doctors, teachers, etc. Production, In short, does not mean creation of all utilities, but only such utilities as have value-in-exchange.

From the above, it is clear that the act of production is not complete till the commodity reaches the hands of the consumers. A table cannot be considered as 'produced' just when it has been made. It must pass through various agencies and reach the final consumer before it can be so considered.

In Economics, we are not concerned with the technical processes of production; we do not study how cloth is actually woven. We do not learn the art of making it. That is the work of spinners, weavers, and dyers. The student of Economics has simply to note the various stages through which cotton passes-ginning, carding, spinning, weaving, bleaching, etc.-till it reaches the hands of the final consumer. We are concerned with economic aspect, i.e., cost, price, profit, etc., and not the technical aspect.

### **2.27 Livestock Production:**

India is predominantly an agriculture country. About 75% of the population practice livestock production (animal husbandry or Pashupaalan) as a crucial subsidiary to agriculture. Livestock Sector alone contributes 24% to the agriculture Gross Domestic Product of India.

Cattle and buffalo are reared mostly for milk and draught purposes, whereas, sheep and goat are reared for meat (flesh) and wool/hair. Pigs are reared for pork (pig meat) and bacon (fat). Backyard poultry are reared for meat and egg.

Livestock rearing is generally practiced by the large number of the landless and small and marginal farmers having a land holding of  $\frac{1}{2}$  to 2 acres by maintaining 2 to 3 animals. Traditionally in India livestock are maintained on grazing and on agricultural crop by products.

But grazing lands are gradually getting reduced as they are diverted for other purposes. Livestock sector gives substantial and regular subsidiary income to the farmers. It also helps in employment generation as well as providing nutritional security in the form of milk, meat and eggs.

About 60% of the labour on livestock farms is provided by women. And more than 90% of work related to care of animals is performed by women of the family. Livestock are reared as an integral part of the life of the people.

Cows, bullocks, buffaloes, sheep, goats, horses, donkeys and camels are not just utility animals. They also are companions at work for the hard working poor farmers. They are reared alongside their own homes.

## **2.28 Statistics of Livestock Production Sector:**

### **2.28.1 Livestock Population:**

There were in all 512,057,301 livestock in India in 2011. In the world scenario, India's rank in terms of livestock population is as follows – 1st in buffaloes, 2nd in cattle and in goats 3rd in sheep, 4th in ducks, 5th in chicken and 6th in camel population. Livestock census are carried out once in every five years in India. According to the 19th Livestock Census 2011.

### **2.28.2 Contribution of Livestock Sector towards National Wealth:**

Livestock sector is considered an important component in poverty alleviation programmes. Due to its large and diversified livestock resources, India has vast potential in meeting the growing needs of millions of people by providing food (milk, eggs, meat), clothing (wool and leather) and various types of raw materials for industrial use.

### **2.28.3 Role in Economy:**

Livestock sector helps in the socio-economic development of rural masses. It is an important sub-sector of Indian agriculture contributing over 5.26 per cent out of the about 31.7 per cent GDP from total agriculture and allied activities to the total Gross Domestic Product (GDP) during 2006-07. Over the last two decades, livestock sector had grown at an annual rate of 5.6 per cent, which is higher than the growth of agricultural sector.

### **2.28.4 Future Outlook**

Livestock sector is more likely to emerge as an important component of agricultural growth in the years to come. It provides food security to the farmers, draught power, organic manure and bio-gas to agriculture sector, and wool, hair/feather, hide/leather, skin, bones, blood and fat to the industrial and pharmaceutical sector.

Livestock acts as a supplementary source of income to agriculture and helps in counteracting the income loss due to crop failure. It acts as a continuous source of income to farmers and reduces seasonality in livelihood patterns of the rural poor.

This sector provides subsidiary occupation to a large section of the society particularly to the people living in the drought prone, hilly, tribal and other remote areas where crop production, on its own, may not be capable of engaging them fully.

Livestock sector also provides large self-employment opportunities. According to the National Sample Survey Organization's latest survey, the estimate of employment in livestock sector is 23.68 million population, which is around 5.80% of the total work force in the country.

#### **2.28.5 Value of Output:**

As per the Central Statistics Office (CSO), the value of output from livestock sector together at current prices was about Rs3,88,370 crore during 2010-11 which is about 28.4% of the value of output of Rs16,23,968 crore from total agricultural and allied sector.

Livestock Sector not only provides essential proteins and nutritious human diet through milk, eggs, meat etc., but also plays an important role in utilization of nonedible agricultural by-products. Livestock also provide raw material/by products such as hides and skins, blood, bone, fat etc.

The contribution of milk alone (Rs2, 62,214.51 crore) was higher than that of paddy (Rs1,51,634 crore), wheat (Rs99,667 crore) and sugarcane (Rs58,470 crore) during 2010-11. The value of output from meat group at current prices in 2010-11 was Rs 72,444.22 crore.

#### **2.28.6 Milk Production:**

India continues to be the largest producer of milk in the world. Several measures have been initiated by the Government to increase the productivity of livestock, which has resulted in increasing the milk production significantly to the level of 102.6 million tons at the end of the Tenth Plan (2006-07) as compared to 53.9 million tons in 1990-91.

The estimate of the milk production in 2010-11 was 121.8 million tons as compared to 116.42 million ton in 2009-10 indicating a growth of 4.66%.

#### **2.28.7 Egg Production:**



Poultry development in the country has shown steady progress over the years. Egg production at the end of the Tenth Plan (2006-07) was 50.7 billion numbers as compared to only 21 billion during 1990-91. The estimate of the egg production in 2010-11 was 63.0 billion as compared to 60.27 billion in 2009-10 indicating a growth of 4.58%. India ranks third in egg production in the world as per FAOSTAT data for the year 2010.

#### **2.28.8 Wool Production:**

Wool production at the end of Tenth Plan (2006-07) was 45.1 million kg, as compared to 41.2 million kg during 1990-91, The annual estimate of Wool production declined marginally from 43.12 million in 2009-10 to 42.99 million kg in 2010-11 indicating a decline of 0.3%.

#### **2.28.9 Meat Production:**

The meat production in 2010-11 was estimated at 4.8 million tons as compared to 4.6 million tonne in 2009-10 indicating growth of 5.7%.

#### **2.28.10 Other Roles:**

Rural Poverty is largely concentrated among the landless and the marginal households comprising about 70 per cent of rural population. Several studies indicate that livestock rearing has positive impact on the income generation, employment opportunities and poverty alleviation for such rural households.

Small animals like sheep, goats, pigs and poultry are mainly kept by the small or landless farmers as a source of income generation because of their low initial investment and operational costs.

### **2.29 Salient Features of 19th Livestock Census**

1. The total livestock population consisting of Cattle, Buffalo, Sheep, Goat, pig, Horses & Ponies, Mules, Donkeys, Camels, Mithun and Yak in the country is 512.05 million numbers in 2012. The total livestock population has decreased by about 3.33% over the previous census.
2. Livestock population has increased substantially in Gujarat (15.36%), Uttar Pradesh (14.01%), Assam (10.77%), Punjab (9.57%) Bihar (8.56%); Sikkim (7.96%), Meghalaya (7.41%), and Chhattisgarh (4.34%).

3. The total Bovine population (Cattle, Buffalo, Mithun and Yak) is 299.9 million numbers in 2012 which shows a decline of 1.57% over previous census.
4. The number of milch animals (in-milk and dry) in cows and buffaloes has increased from 111.09 million to 118.59 million, an increase of 6.75%.
5. The number of animals in milk in cows and buffaloes has increased from 77.04 million to 80.52 million showing a growth of 4.51%.
6. The Female Cattle (Cows) Population has increased by 6.52% over the previous census (2007) and the total number of female cattle in 2012 is 122.9 million numbers. The Female Buffalo population has increased by 7.99% over the previous census and the total number of female buffalo is 92.5 million numbers in 2012. The buffalo population has increased from 105.3 million to 108.7 million showing a growth of 3.19%.
7. The exotic/crossbred milch cattle increased from 14.4 million to 19.42 million, giving rise to an increase of 34.78% whereas the indigenous milch cattle increased marginally from 48.04 million to 48.12 million, an increase of 0.17%. The milch buffaloes increased from 48.64 million to 51.05 million with an increase of 4.95% over previous census.
8. The total sheep in the country is 65.06 million numbers in 2012, declined by about 9.07% over census 2007.
9. The Goat population has declined by 3.82% over the previous census and the total Goat in the country is 135.17 million numbers in 2012.
10. The total pigs in the country have decreased by 7.54% over the previous census and the total pigs in the country are 10.29 million numbers in 2012.
11. Horses & Ponies population has increased by 2.08% over the previous census and the total Horses & Ponies in the country is 0.62 million numbers in 2012.
12. The total Mules in the country have increased by 43.34% over the previous census and the total Mules in the country are 0.19 million numbers in 2012.
13. Camel population has decreased by 22.48% over the previous census and the total Camels in the country is 0.4 million numbers in 2012.

14. The total Donkey population in the country have decreased by 27.22% over the previous census and the total donkeys in the country are 0.32 million numbers in 2012.
15. The total poultry population in the country has increased by 12.39% over the previous census and the total poultry in the country is 729.2 million numbers in 2012.
16. The total Mithun and Yak in the country has registered a growth rates of 12.98% and -7.64% respectively over the previous census and the Mithuns and Yaks in the country is 0.29 million and 0.07 million in numbers respectively.

## **Rural Livestock Management and Marketing**

### **2.30 Introduction**

Livestock sector plays an important role in socio-economic development of rural households. It contributes about 6 per cent to the Gross Domestic Product and 25 percent to the Agricultural Gross Domestic Product. Over the last two decades, livestock sector has grown at an annual rate of 5.6 per cent, which is higher than the growth of agricultural sector (3.3 per cent). This suggests that livestock is likely to emerge as an engine of agricultural growth in the coming decades. It is also considered as one of the potential sector for export earnings. The importance of livestock goes beyond its food production function. It provides draught power and organic manure to crop sector and hides, skin, bones, blood and fibers to the industrial sector. Livestock sector also makes significant contributions towards conservation of environment. Livestock sector supplements income from crop production and other sources and absorbs income shocks due to crop failure. It generates a continuous stream of income and employment and reduces seasonality in livelihood patterns particularly of the rural poor.

Rural Poverty is largely concentrated among the landless and the marginal households comprising about 70 per cent of rural population. Several empirical studies indicate that livestock rearing has significant positive impact on equity in terms of income and employment and poverty reduction in rural areas as distribution of livestock is more egalitarian compared to land. In India, over 70 per cent of the rural households own livestock and a majority of livestock owning households are small, marginal and landless households. Small animals like sheep, goats, pigs and poultry are largely kept by the land scarce poor households for commercial purposes because of their low initial investment and operational costs. This paper analyses the development of livestock sector in terms of population, production, trade and employment on one hand and the role of livestock sector in reducing rural poverty on the other.

The livestock sector alone contributes nearly 25.6% of Value of Output at current prices of total value of output in Agriculture, Fishing & Forestry sector. The overall contribution of Livestock Sector in total GDP is nearly 4.11% at current prices during 2012-13. L Realizing the importance of this sector and also of timely availability of data, many improvements have been brought in census. The census was conducted by Animal Husbandry Departments of States/UTs under the central sector scheme with 100% central grant from the Department of Animal Husbandry, Dairying and Fisheries in the Ministry of Agriculture. Most of the States/UTs conducted the census on schedule time except in some states where delay occurred due to adverse climatic condition, natural calamities, elections and other administrative reasons. The data were collected in the form of three schedules with more than three hundred main data items including broad age group, sex wise, breed wise, species etc.. Officers and staff associated with census work were provided intensive training for data collection, supervision, processing and validation. The data were collected from each household and other entity both in rural and urban areas. The data were collected through oral inquiry method by the staff of Animal Husbandry Department or enumerators trained by them. Manual of instructions were prepared. Supervision of fieldwork was done by departmental officers and staff only. Software development, data entry, data validation, data finalization and report generation were carried out in association with National Informatics Centre, Ministry of Information and Communication Technology. The progress in this sector is attributed not only by the fact of increasing production of milk, egg, meat and wool but also overall development of livestock by its diseases control, progeny development and related infrastructure etc.. The total numbers of animals in each of the identified species are very important determinant factor in the growth of livestock sector. A brief analysis is given in this report considering the comparison of the previous census results as well as the data collected from the current census.

### **2.31 Classification of Market**

Market can be classified on different basis. There are different types of markets on the basis of geographical area, time, business volume, nature of products, consumption, competition, seller's situation, and nature of transaction etc. as follows

**2.31.1 Classification of market on the basis of geographical area:** Market can be classified in local, regional, national and international level on the basis of geographical area:

- i. Local market- The market limited to a certain place of a country is called local market. Perishable consumer products such as milk, vegetables, fruits, etc. are sold and bought in local markets.
- ii. Regional market- The market which is not limited to a certain place but expanded in regional level is called regional market. Mostly, food grains such as wheat, paddy, maize, millet, sugar, oil etc.
- iii. National market- If buying and selling of some products is done in the whole nation, this is called national market. The products such as clothes, steel, cement, iron, tea, coffee, soap, cigarette, etc. are bought and sold nationwide.
- iv. International or global market- Market cannot be limited to any geographical border of any country. If the goods produced in a country are sold in different countries, this is called international market. Today, not any country of the world is self-dependent. All the countries are exporting the goods produced in other countries. The market of some goods such as gold, silver, tea, clothes, machines and machinery, medicines etc. has spread the world over.

**2.31.2 Classification of market on the basis of time:** On the basis of time, market can be divided in very short-term, short-term, long term and very long-term market.

- i. Very short-term market- The market where shortly perishable goods are sold is called very short-term market. The market of milk, fish, meat, fruits and other perishable goods is called very short-term market. The price of short goods is determined according to the pressure of demand. When the demand for such goods is high, price rises and when demand declines, the price falls down. If the supply is low and the demand is high, the price rises higher. In such market supply cannot be increased.
- ii. Short-term market- In the short term market, supply of products can be increased using the maximum capacity of installed machines of the firm. The goods cannot be produced according to the demand for adjustment of supply by expanding or changing the existing machines and equipment. In short-term market, price of the goods is determined on the basis of interaction between demand and supply. But, as the supply cannot meet the demand, demand affects price determination in short-term market.
- iii. Long-term market- In long-term market, adequate time can be found for supply of products according to demand. New machines and equipment can be installed for additional production to meet demand. As supply can be decreased or increased

according to demand situation, price is determined by interaction between demand and supply in long-term market. Market of durable products is long-term market.

- iv. Very long-term market or secular market- In secular market, producers can get adequate time to use new technology in production process and bring new changes in products. They become able to produce and supply goods according to changed needs, interest, fashion etc. of customers. Market research becomes helpful in doing so.

**2.31.3 Classification of market on the basis of volume of business:** On the basis of volume of business, type and size, market can be classified in wholesale market and retail market.

- i. Wholesale market- If a large quantity of products are purchased from producers and sold to different retailers, this is called wholesale market. In wholesale market, the products are not sold directly to ultimate consumers. But, if consumers want to buy in large quantity, they can buy from wholesaler.
- ii. Retail market- The market that sells small quantity of products directly to ultimate consumers is called retail market.

**2.31.4 Classification of market on the basis of nature of product:** On the basis of nature of product, market can be classified in two types as follows:

- i. Commodity market- The market where consumer and industrial commodities like clothes, rice, machines, equipment, tea, soap, fruits, vegetables etc. are bought or sold is called commodity market. In some market only certain special commodities are bought and sold and in some other different consumer commodities are bought and sold.
- ii. Financial market- The market and financial instruments is called financial market. In such market, money, shares, debentures, treasury bills, commercial papers, security exchanges, loan giving or taking etc are dealt. Dealing of short term fund is called money market and dealing of long-term fund is called capital market.

**2.31.5 Classification of market on the basis of consumption:** On the basis of consumption of products, market can be divided as follows:

- i. Consumer market- The market of products, which the people buy for consumption, is called consumer market. The customers buy consumer goods, luxury goods etc. for daily consumption or meeting their daily needs from such market.
- ii. Industrial market- Generally, raw materials, machines and equipment, machine parts are dealt in industrial market. Domestic consumer goods are produced using them.

**2.31.6 Classification of market on the basis of competition** On the basis of competition, market can be classified into monopoly market, perfect market and imperfect market.

- i. **Monopoly market-** If there is full control of producer over market, then such market is called monopoly market. In such market, the producer determines price of his products in his own will. In such market, only one producer or seller controls market. In practice, the producer or seller can supply products or achieve monopoly on price only in small or limited area, but in wide area it becomes impossible.
- ii. **Perfect market-** The market where the number of buyers and sellers is large, homogeneous of products are bought and sold, same price of similar type products is determined from free interaction between demand and supply is called perfect market. Perfect competition takes between consumers and producers or buyers and sellers, but in practice perfect market can be rarely found.
- iii. **Imperfect market-** The market where there is no perfect competition between buyers and seller is called imperfect market. In this type of market, customers are affected by product discrimination. Post-sale services, packaging, price, nearness of market, credit facility, discount etc. make product discrimination. Customers can buy same types of products from different sellers according to their desires and comfort. In practice, mostly products are bought and sold in imperfect market.

**2.31.7 Classification of market on the basis of seller's position** On the basis of seller's position, market can be divided into primary market, secondary market and terminal market.

- i. **Primary market-** In primary market, primary goods are bought and sold. Producers sell primary goods such as agricultural products, food grains, livestock, raw materials etc. to wholesalers or commission agents in such market.
- ii. **Secondary market-** Primary goods are bought from producers and sold to retailers in secondary market. Generally, wholesalers buy secondary products and sell them to retailers.
- iii. **Terminal market-** In this type of market, retailers sell products to final consumers.

**2.31.8 Classification of market on the basis of nature of transaction** On the basis of nature of transaction, market can be classified into spot market and future market.

- i. **Spot market-** The market where delivery or handling over of the good is made immediately after sales is called spot market. In such market, price of product is paid

immediately at the spot and ownership of the product is transferred to buyer at the same time.

- ii. **Future market-** In this type of market contract is signed for sale of products in future, but no delivery of product is made. In this market, buyer and seller sign a contract for buying and selling products at certain rate of price or on condition to determine the price in future.

**2.31.9 Classification of market on the basis of control** On the basis of control, law, rules and regulations, market can be classified into regulated market and Non-regulated market.

- i. **Regulated market-** If trade association, municipality or government controls buying, selling, price of products etc. it is called regulated market. Such market must follow the established rules, regulations and legal process and provisions. Otherwise, the businessmen are fined or punished.
- ii. **Non-regulated market-** If a market is freely functioning and is not under control of any government body or any organization, it is called non-regulated market. In such market, price is determined through interaction between demand and supply of products and buying and selling takes place. This market has not to follow any rules, regulations and legal provisions.

### **2.32 The seven steps of livestock marketing**

1. **Estimate costs:** The first step involves accurately estimating costs of production and cash flow needs. This step is listed first because of its importance. While it can be done at any time, it is best to do this step as early as possible. By estimating both production costs and cash flow requirements, you can decide what type of animal to produce and when it will have to be sold to meet payment schedules. These estimates, along with price forecasts, should be used to determine how the animal will be marketed. Knowing past production costs and future price forecasts can also help determine when to retain female stock for expansion or when to cull more heavily. Production cost estimates and breakeven calculations are critical in setting a series of target prices that should be watched for in the changing market.
2. **Gather information, including market outlook:** Following market trends and projected livestock prices helps you decide what to produce to bring the greatest net returns. For example, deciding whether to sell as weaned calves, yearlings or slaughter



cattle depends upon the market outlook for each of these animals. Income tax considerations are also a factor in timing of sales.

- 3. Know your product:** The quality and type of livestock for sale must be known before you can seriously evaluate the different pricing and delivery alternatives. By knowing what you have for sale, you can contact interested buyers and, if there are premiums in the market for livestock with specific characteristics, you can then capitalize on them. Knowing your product also involves presenting it favourably. Sorting animals into lots of similar size and weight will make them more attractive to buyers. Selling clean and healthy animals assures buyers that they are paying for a quality product.
- 4. Set several target prices:** Set target prices by knowing production costs and what the market is paying or is expected to pay. The level and timing of these targets should be set based on outlook information, cost of production figures and cash flow needs rather than expected profit levels. The advantage of setting several target prices rather than just one price is that it gives you flexibility to respond to changing market trends. Staying in touch with the market is crucial when trying to achieve a target price.
- 5. Evaluate pricing and delivery alternatives:** Evaluate all available alternatives for pricing and delivering livestock. Each alternative has specific features that may make it more suitable for you than another one. When pricing livestock, there are several choices available. A forward contract offers you the opportunity to lock in a price for the livestock ahead of an expected sale date. Other livestock pricing alternatives include open bids at auction markets, producer or breed association sales, video auctions, electronic auctions, direct sales to packers, sales to livestock order buyers or using the futures or options market for a hedging strategy. As a pricing alternative is considered, keep the target prices in mind. For each of the market delivery alternatives, there are associated pricing methods to consider. For example, a pricing method may determine whether an animal is sold live or rail graded, and whether it is sold with a pencil shrink or not. All pricing agreements will have a direct influence on the final returns. When evaluating marketing alternatives, keep in mind how the animals will be delivered to the buyer and if this delivery method will influence the settlement price. Transportation considerations include both the costs of the trucking and the costs of lost quality or weight of the animals. These factors should be kept in mind as you decide how and where to price the livestock. Pricing and delivery decisions are typically made together when selling. The pricing decision will sometimes dictate what the delivery method will be. Some marketing alternatives enable both pricing and delivery factors to be

negotiated when reaching a settlement price with a buyer. By knowing production costs, cash flow needs and current market conditions, you can determine if the price being negotiated is suitable for your needs and is a reasonable price for current conditions.

6. **Stick to your plan:** A livestock marketing plan involves all the steps listed above. By executing these steps, you will have a better understanding of how your business is functioning. Have confidence to stick to your plan as you follow the market.
7. **Evaluate your plan:** All plans must be evaluated to determine what worked and what can be improved upon. By looking back on livestock sales and how the returns matched the needs of the business, you will continue to learn about what factors influence the operation. This learning process will provide opportunity for future growth.

### Questions:

1. Define rural livestock management? List the projected operated area guidelines in agriculture?
2. Write down the Evolution of Agricultural Finance in India and Policy Milestones?
3. What do you mean by Institutional Agricultural Credit? Write down about Regional Disparity in Agricultural Credit?
4. List out the Impact of farm loan waiver on finance?
6. Define livestock production economics? Is economics science or art?
7. What do you mean by Utility, Price, Value, asset, Capital?
8. Write down theories of production?
9. What do you mean by Livestock Production? Write down the statistics of Livestock Production Sector?
10. Define rural livestock marketing? List out the Classification of market with respect to rural livestock?
11. What do you mean by marketing of rural livestock? List out the steps of livestock marketing?

### Suggested Readings

- Rana Ranjit Singh, (1 January 2014), Farm Animal Management: Principles and Practices, New India Publishing Agency
- Katar Singh(2009), Rural Development: Principles, Policies and Management, SAGE Publications India Pvt. Ltd. Publication year: 2009
- H. D. Foth & I. M. Turk, Fundamentals of Soil Science, Wiley Eastern

- Bneerjee G. D, Srijeet (2012) ,Rural Entrepreneurship Development Programme in India, An Impact Assessment, Abhijeet publication
- B. K. Prasad, (2003), Rural Development-Concept, Approach and Strategy, Sarup & Sons

# **CERTIFICATE COURSE IN RURAL MANAGEMENT**

## **COURSE: RURAL MANAGEMENT**

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### **UNIT 3: RURAL DEVELOPMENT MANAGEMENT: ISSUES IN MANAGEMENT OF RURAL DEVELOPMENT PROJECTS, PROJECT DIMENSION, IDENTIFICATION AND FORMULATION**

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#### **STRUCTURE**

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##### **3.7 Detailed Project Report (DPR)**

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## **Suggested Readings**

### **3.0 Objectives**

1. Explain the relationship between policies, programmes and projects, specifically in relation to rural development.
2. Indicate the dimensions of a project.
3. Describe the process of formulating a project.
4. To identify, plan and implement a project successfully.
3. Projects form a clear and distinct portion of a larger, less precisely, defined programme.
4. Projects are concerned with the practical implementation of agreed objectives.

## **Rural Development Management: Issues in Management of Rural Development Projects**

### **3.1 Introduction**

How logically a project is planned doesn't matter, there would still be deviations between what is projected and what is actually achieved. The deviations may be in terms of time schedule or resource use or flow of benefits from the project. The most common cause identified for such deviations has been bad management. The present unit attempts to find out these questions. An assessment of the process of management has also been made to identify measures for better management of rural development programmes.

The underlying basic principle of the unit is that the role of management in our society is essential for the progress of human beings. It helps to fulfil a great need of our time, viz., to improve standards of living for all people through effective utilization of human and material sources.

Management is a universal process. It is not only restricted to a factory and office. It is an operative in all organisations and tries to achieve stated goals. Management is, therefore, as much essential for business firms as for government enterprises and departments.

Management is a type of action primarily responsible to get things done through others by directing the efforts of other people. Managers in any field of individual effort perform distinctive managerial functions irrespective of what they are managing. It is difficult to accomplish the best possible allocation and utilization of human, material and financial resources without efficient management. There are several definitions of management.

According to Peter F. Drucker, the famous management expert, "Management is a multi-purpose organ that manages a business, manages manager, and manages worker and work."

Stoner and Wenkel have defined management as the “process of planning, organising, leading and controlling the efforts of organisation members and of using all other organisational resources to achieve related goals.”

According to Harold Koontz, “Management is the art of getting things done through and with people in formally organised groups. It is the art of creating an environment in which people can perform as individuals and yet cooperate towards the attainment of group goals. It is the art of removing blocks to such performance, a way of optimizing efficiency in reaching goals.”

The definitions do not materially differ except in terms of emphasis. They show that management is concerned with attainment of group goals in an efficient way through the combined efforts of people. This involves working with and directing people, planning, organising, leading and controlling. Most management experts consider management as primarily an art, though an increasing number emphasise that it has the elements of a science as well.

As Koontz and O’Donnel have stated: “Managing like other practices... is an art. It is ‘know-how’. It is undertaking things in the light of the realities of a state of affairs. But the practice of managing, like other practice, will be better by making use of underlying organised knowledge; and it is this knowledge, whether crude or advanced, whether exact or inexact, that, to the extent it is well organised, clear and pertinent, comprises a science. Thus, managing as practice is art; the organised knowledge, underlying it may be referred to as a science.”

### **3.2 Implementation of Rural Development Projects**

The main functions of management are effective implementation.

Implementation may be regarded as a process by which a set of preset activities is carried out in a planned manner with a view to achieve certain established objectives. Implementation is, thus, a subset of a broader set of activities that form management. A programme is usually implemented through a series of well-defined projects. The scope of a plan is still broader in the sense that it usually comprises a number of programmes. Thus, for its implementation, a plan has to be broken down into a number of programmes, each of which is, in turn, broken down into a number of projects. A project treats the questions, what, who, when, where and how more specifically than does a programme.

#### **3.2.1 Steps of Implementation**

Implementation consists of two sub-steps:

1. Pre-operation step
2. Operation step

The pre-operation phase of implementation begins when the feasibility report has been completed and financing has been arranged. The pre-operation phase may be considered to be complete when various components of the project are installed and put into operation.

The objectives of project management in the operation step are as follows:

- Completion of the project on time;
- Completion of the project within the contemplated cost.

### **3.2.2 Factors Affecting Implementation**

There are several factors which affect the implementation of a programme. A rural manager has to understand their role and function. Let us briefly list them.

i) **Technical Factors:** Rural projects can be of diverse kinds - irrigation, livestock development, wasteland development, etc. All of these involve the use of technology and recruitment of technical manpower, so that all the production functions are efficiently tied up to maximize output. Rural development management requires understanding of the technical factors involved and how to manage them.

ii) **Economic and Financial Factors:** These relate to factors affecting credit, subsidies, pricing and choice of resources, etc.

iii) **Commercial Factors:** These relate to marketing of outputs, supply of inputs, etc.

iv) **Socio-Cultural Factors:** Since rural society and economy are closely interlinked, the project manager has to understand the role of socio-cultural values, tradition, social structure, castes and kinship pattern, social institutions, etc., and social stratification.

v) **Political Factors:** The power structure, dominant groups, leadership patterns etc., too affect implementation.

vi) **Institutional, Organisational and Managerial Factors:** The implementation of the project will be affected by the extent to which the organisational and managerial objectives and functions have been clearly laid down, responsibilities clearly demarcated, inter-linkages tied up, and monitoring and project control systems developed.

vii) **People's Participation:** Involvement of people in the implementation of the project is of key importance. Therefore, the project manager should not only aim at people's participation, but also develop the strategies and the mechanisms.

viii) **Integration and Coordination:** Since implementation involves several agencies, therefore integration and coordination both vertical and lateral are absolutely essential.

### 3.2.3 Delays in Implementation

The most important problem faced in the implementation phase of a project is delay in execution. This is also referred to as slippage of projects, which results in increase of costs and also the loss of returns. The result is that the initial assumption in the feasibility report is thrown completely out of gear. The delays are generally caused by internal as well as external factors.

The **internal factors**, which cause delay, are:

- Inadequate planning based on wrong and inadequate information lack of reasonable norms of responsibility
- Poor industrial relations
- incorrect selection of agents
- Non-involvement of people
- insufficient financing
- Choice of wrong technology
- Lack of coordination among execution departments
- Absence of delegation of power

The **external factors**, which may cause delay, are:

- Input problems frequent change in administration at the senior level, affecting the continuity of policy
- Lack of public cooperation.
- Transportation problems

In spite of taking all the care, there are bound to be factors beyond the control of a manager, which are likely to cause delay in project implementation. Therefore, it is necessary to build a system, which can exact deviations from the initial expectations and ensure that the schedule of the project is not disturbed. To perform such tasks, there needs to be a scientific system of flow of management information to the executive at various levels in the organisation. We will read about these aspects in the units that follow.

The system of monitoring and control is more effective when, along with the time-frame, there is linkage between the physical work to be performed in each activity and the financial expenditure to be incurred. The operational plan should include the following aspects:

- The breakdown of the project's final goals into various subsystems and these subsystems into activities and sub-activities.
- The time schedule for starting and completion of each activity and sub activity and their sequencing.



- Connecting of physical work involved in each activity with financial expenditure.
- Monitoring and control system.

## **Project Dimensions, Project Identification, Project Formulation**

### **3.3 Introduction**

In this Chapter, the Project Dimensions, Project Identification and Project Formulation will be discussed. However, we will first take up a detailed examination of the dimensions of projects including various types of linkages. After this it is expected to facilitate identification of development projects for selection and appraisal and project formulation.

### **3.4 Project Dimensions**

This is known that a project would belong to a sector/sub-sector of development. In this process, it gets identified with a particular sector/subsector.

In the real world situation, such identification has been ambiguous. A project has many more dimensions and it is essential to identify them.

**3.4.1 Activity group:** The first dimension of the project is the activity group or nature of the activity to which it belongs. This is the most primary dimension recognized by everyone. The project would belong to any of the following four activity groups classified according to the nature of the activities.

Such activity groups are:

- a) final commodity producing sectors,
- b) productive infrastructural sectors,
- c) marketing infrastructural sectors, and
- d) Social service infrastructural sectors.

We will describe their nature here.

The nature of this pattern of grouping is such that groups (b), (c) and (d) are complementary to group (a) Group (d) stands on its own, as it largely comprises sectors/sub-sectors that provide for minimum social needs. Hence, it leaves little choice of any shift of investment from one sector to another within the group or with (b) and (c).

In terms of implications, consequent to a change or revision in groups, the direction of change needs to be assessed properly. In respect of groups (b) and (c), a revision effected within group (a) will indicate the direction in which the revision in these two groups should be done.

For example, let us take milk production. Suppose, there is a change within group (a), since milk production is to be assigned relatively more investment.

This would call for, correspondingly, more investment in feeding and veterinary facilities in group (b) and, similarly, more in marketing infrastructure for animal feed and milk output. Therefore, it follows that chronological procedure is to be followed while identifying and revising projects.

**3.4.2 Independence and complementarity:** The project may belong to a wider programme in which it may either be independent or complementary to other projects. The attempt should, however, be to avoid disagreement of objectives between the projects. This will make sure maximization of benefits to the beneficiaries and, ultimately, the society.

**3.4.3 Potential beneficiary group:** Since a project is a planned intervention for the development of a certain social segment within a specific time period, the potential segment's interest becomes another measurement of the project. The project would have one or other of the following potential beneficiary groups as targets:

- the population of a Community Development Block in general or the inhabitants of a group of villages, e.g., for roads/electrification;
- the village community as a whole, e.g., for school, primary health centre, drinking water, public tube well;
- members of a cooperative society, e.g., for collection/chilling centre for a milk cooperative, wool carding centre for a weaver's cooperative;
- a specific target group, such as an association of target group persons or households for sharing an irrigation tube-well or a drinking water well. It may also consist of individual members of households belonging to the target group, e.g., housing, dairy unit, shoe making;
- Private individuals, private firms and companies or households in general, e.g., small scale unit, dairy unit, orchard plantation.

**3.4.4 Share in investment (capital structure):** The capital structure is determined by the share in investment proposed by the private sector in the project.

The capital structure is a very important dimension of a project.

Depending on the beneficiary group, and their interests as outlined above, the capital could be obtained from the public sector, individuals and institutions in the private sector, the village community or panchayat, a cooperative society or a combination of these.

In some extreme cases, investments would be wholly public or private. Further, depending on the investors and in what proportions they share the project investment, the capital assets formed under the project may be shared and owned accordingly.

**3.4.5 Financial interests:** Consequent to the capital structure, financial interests in the project could be several. Depending on the contributor's share in the project, the interests would fluctuate. Project finances may also come partly through fund transfers among the investors themselves by way of grants and loans or partly in the form of loans from financial institutions. This measurement of the project cannot be ignored.

**3.4.6 Allocation and area specificity:** The problem of allocation of time and resources, especially capital, has an important bearing on project identification.

Therefore, it calls for proper coordination among different activities.

The spatial distribution and locational structure of economic activities and facilities determine which type of projects could be formulated and what could be the allotment of different resources. Concepts like growth poles and central places can be used to illustrate the spatial and locational dimension of the project.

A growth pole is a location (a town, village, or area) where one or more major economic activities (e.g., major industries or production centres) are concentrated. A central place is a location where major physical (transport, warehouses, communication) and institutional (marketing, financial infrastructural) facilities are concentrated.

There would normally be an order of priority amongst growth poles and central places in a region, depending on the extent of concentration of production activities and infrastructural facilities. While some projects may yield improved developmental results when located in existing growth poles or central places, other projects may require to be set up to create new growth poles or central places.

### **3.5 Project Identification**

The process of project identification starts with the beginning of an idea. The ideas have to be tested for their expediency and worthiness, say in a community development block. The key factor in the guide is to subject the idea to the following questions:

- Will the project implied in the idea fall within block level planning activities in terms of scope and the order of investment it is likely to require?
- Are its technical features, including physical location, layout, alignment, etc. prima facie sound?

Whether the material conditions for its successful operation, in terms of actual and potential availability of required raw materials and energy, present in the block?

- Will the required skilled manpower be available either because it already exists or there are conditions for its fast development?

- Is there a local demand for the goods or services the prospective project is intended to produce? And if local demand is not adequate, can the excess output be sold to urban centres or to neighbouring blocks at competitive prices?
- Are the particular social minimum needs the potential project is intended to serve at present unfulfilled in the block?

If the answer to these questions is an emphatic ‘yes’, the project idea should be translated into a project blue-print. And if the answer turns out to be ‘no’, the project idea should be dropped or, at best, postponed until conditions favourable for reconsideration arise.

### **3.6 Project Formulation**

After the series of project ideas have, thus, been identified and tested, individual projects need to be explicitly formulated or prepared on the basis of a detailed analysis of specific techno-economic relationships. Project formulation generally leads to a Detailed Project Report (DPR). This is the stage at which detailed studies will commence, so that rational estimates can be made of how the project might be implemented and of its likely income generating capacity.

A detailed preparation of a blue-print takes time, often a year or two or even longer for complex projects. It is costly, too, as it may well cost seven to ten per cent of the total project investment.

The process of formulation or preparation includes all the work necessary to bring the project to the point at which a careful review of appraisal can be undertaken and, if selected, implementation can be carried out.

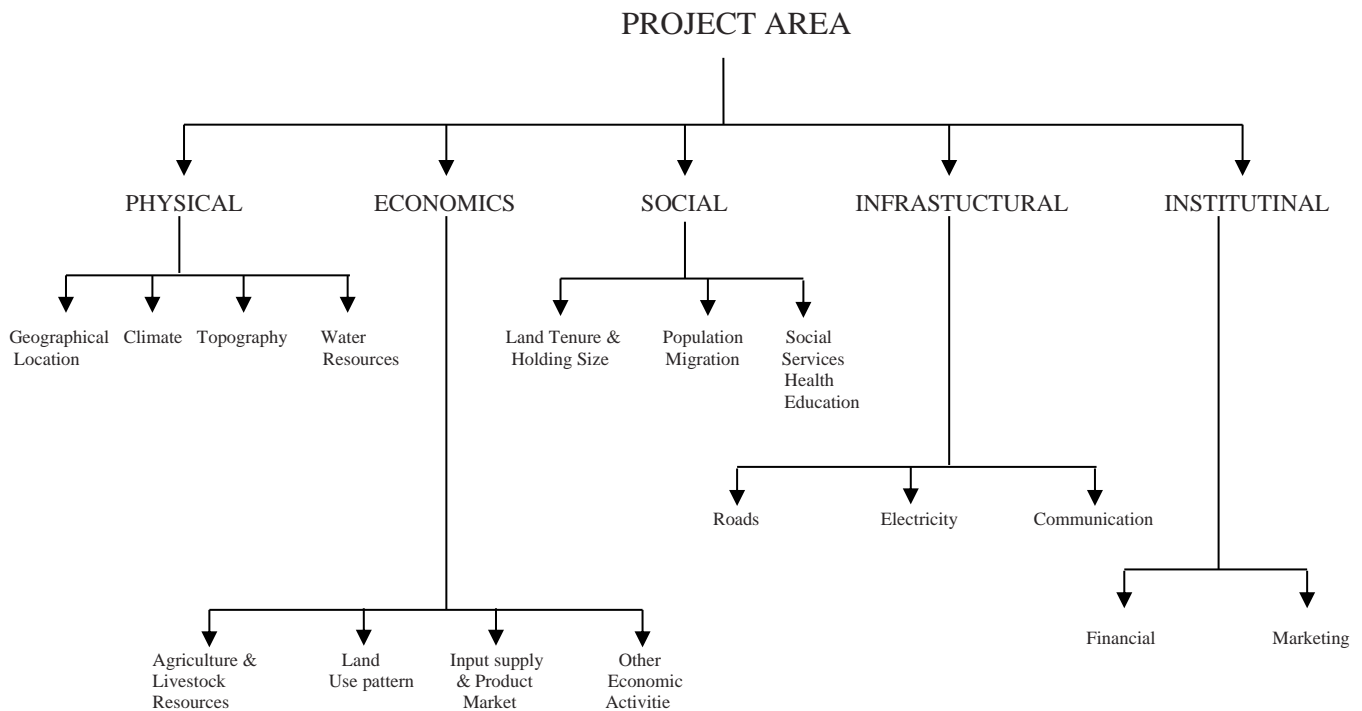
A feasibility study has to be undertaken as the first step in project preparation.

This initial step makes it easier to decide if detailed advanced planning needs to be done. The practicability study should also provide an opportunity to shape the project to fit its physical and social environment. This is expected to ensure that the project when implemented will be giving maximum returns. Details of feasibility analysis will be discussed in subsequent units.

#### **Step One**

We have discussed earlier the process by which the objectives of a block plan are finalized. These objectives will now have to be matched with the physical and social conditions of the block (Step One). Since each plan for a project is time-bound, you have to first make an inventory of all the resources in the base year. The accompanying chart will describe the manner or scheme of actions to be initiated by you at the block level,

**Chart: Details about the features of the project area to be identified while formulating a project**



### **The Next Step**

The next step involves working out the activities and general facilities, their phasing, costs and mode of financing. The organisation and management aspects are also worked out at this stage. However, it must be noted that the activities would vary depending on the nature of the project. A following outline is given below:

- i. The Project Description
- ii. Component Details: Works and General Facilities
- iii. Project Phasing
- iv. Cost Estimates
- v. Financing
- vi. Organisation and Management
- vii. Production, Markets and Financial Expectations
- viii. Benefits and Justification
- ix. Outstanding Issues
- x. Annexure

### **3.7 Detailed Project Report (DPR)**

The World Bank recommends that, a DPR should aim at a main text of about twenty-five single spaced typescript pages for a simple agricultural project and not more than fifty pages for a complex rural development project. This has to be supported by a series of annexure, possibly in a separate

volume. As far as possible, the main text should present the project in a form that a non-specialist can understand. Specialised back up information – maps, charts and detailed tables – should be reserved for the annexure.

In the beginning, however, it must be noted that the substance of a project's DPR is more crucial than its set-up, primarily because each project will have a different focus. Hence, different elements of the project will need different emphasis. However, an outline of format is provided here, so that you can have a starting point. The checklist of the format, as discussed in previous sections, can now be given as follows:

**Summary and Conclusion:** This section should, give the essential elements of the project. It will include the rationale, priorities, beneficiaries, main components, investment period, costs, organisation, financial and economic efforts.

**Introduction:** This section should indicate the origin of the project idea and agencies responsible for preparing the DPR. This section is basically a non-technical one and should be brief.

**Background:** This part is mainly for establishing the framework of the project in relation to the environment (natural, economic and social). The material presented here should have a direct bearing with materials to be presented in subsequent sections.

**Project Rationale:** This section should provide a influential discussion based on the process of identification discussed earlier. It should also give technical, economic and social justification for the selection of the project. Since there are many development strategies, all cannot be adopted by the project. Hence, an explanation must be provided for choosing a particular strategy.

**Project Area:** The development opportunities and potentials of the project need to be mentioned here. We have already dealt with this aspect in a detailed manner in a preceding section.

**Organisation and Management:** The implementation and monitoring agencies for different aspects of the project. It should also discuss the administrative arrangements, staffing patterns, equipment, functions and powers of the project authority.

**Production, Markets and Financial Results:** Show why beneficiaries should join the mainstream of the project. The financial and economic feasibility of the project should be provided here.

**Benefits and Justification:** This is a crucial part of the DPR where all aspects of the project, discussed till now, are to be assessed for social and economic desirability. We will take this up in the next section for a detailed treatment.

**Outstanding Issues:** Contains some major issues, which the project will have to tackle at some future date.

**Questions:**

1. Define rural development management? Write down the steps in implementation of rural development projects?
2. Define rural development management? What factors a manager can take into consideration while implementation in rural development projects?
3. What do you mean by rural development management? What are the dimensions processes of project? How you can identify and formulate a project?

### **Suggested Readings**

- Katar Singh(2009), Rural Development: Principles, Policies and Management, SAGE Publications India Pvt. Ltd. Publication year: 2009
- H. D. Foth & I. M. Turk, Fundamentals of Soil Science, Wiley Eastern
- Bneerjee G. D, Srijeet (2012) ,Rural Entrepreneurship Development Programme in India, An Impact Assesment, Abhijeet publication

## **CERTIFICATE COURSE IN RURAL MANAGEMENT**

### **COURSE RURAL MANAGEMENT**

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**UNIT 4 PROJECT APPRAISAL-I (TECHNICAL FEASIBILITY) PROJECT APPRAISAL-II (ECONOMIC FEASIBILITY), PROJECT APPRAISAL-III (FINANCIAL FEASIBILITY)**

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## **STRUCTURE**

### **4.0 Objectives**

#### **4.1 Introduction [Project Appraisal-I (Technical Feasibility)]**

#### **4.2 Technology acquired through collaboration tie-ups, the key areas to be probed**

### **4.3 Project requirements**

#### **4.3.1 Location**

#### **4.3.2 Project location**

#### **4.3.3 Land and Building**

#### **4.3.4 Plant and Machinery**

### **4.4 Method of production**

### **4.5 Production Technique**

#### **4.6 Introduction [Project Appraisal-II (Economic Feasibility)]**

#### **4.7 Economic Feasibility**

#### **4.8 Economic Efficiency**

#### **4.9 Costs and Benefits**

#### **4.10 Role of Time in Economic Appraisal**

#### **4.11 Present and Future Economic Values**

#### **4.12 Choice of Economic Efficiency Indicators (Decision Criteria)**

##### **4.12.1 Present Value of Net Benefit (PVNB)**

##### **4.12.2 Benefit-Cost Ratio (B/C Ratio)**

##### **4.12.3 Internal Rate of Return (IRR)**

#### **4.13 Introduction [Project Appraisal III (Financial Feasibility)]**

#### **4.14 Purpose of Financial Feasibility Analysis**

#### **4.15 Characteristics**

#### **4.16 Conducting Financial Feasibility**



#### **4.17 Criteria for Financial Feasibility or Indicators**

##### **4.17.1 Pay Back Period (PBP)**

##### **4.17.2 Average Return on Investment (ARI)**

##### **4.17.3 Financial (Internal) Rate of Return (FRR)**

#### **4.18 Acceptability criteria for the project**

##### **Questions**

##### **Suggested Readings**

#### **4.0 Objectives**

1. It is a tool to check the viability of a Project Proposal.
2. To decide why and when to carry out a financial feasibility analysis.
3. To carry out computation work involved in estimating different indicators.
4. Assessment of a project in terms of its economic, technical and financial viability.

5. Decide to Accept or reject a project.
6. Examines overall potential of project.

## **Project Appraisal-I (Technical Feasibility)**

### **4.1 Introduction**

The technical Feasibility Study aims to determine whether or not the product is technically feasible. This study determines how the technical requirements of the project can be fulfilled, which location would be the most appropriate and what should be the size of the plant? This study and demand and market feasibility study are the important pre-requisites for evaluating project prospects for commercial profitability and national economic profitability upon which the final decision should depend. The technical study also provides the basis for cost estimating.

The technology may be indigenous or imported through foreign collaboration. In the case of indigenous technology it should be ensured that suitable technical personnel are available.

### **4.2 Technology acquired through collaboration tie-ups, the key areas to be probed are:**

- (a) The standing of the collaborators and past experience concerning tie-up arrangements with them.
- (b) Adequacy of the scope and competitiveness of the terms of the collaboration in relation to the requirements of the project, project engineering, equipment specifications, drawings, process know-how, erection and commissioning of the plant, trial-run operations and performance test, training facilities etc.
- (c) Performance guarantee and its adequacy in relation to rated capacity of plant and machinery.
- (d) Reasonableness of financial and other costs by way of down payment, royalties etc.

The cost of the project should provide for the know-how fee, training expenses, foreign trips etc.

The project needs to be examined with particular reference to the following points regarding the technical feasibility:

### **4.3 Project requirements**

Once the method of production and its technique are determined, technical people have to determine the projects' requirements during the investment and operating periods. These include:

#### **4.3.1 Location:**

The success of a project generally depends on its proper location yielding the advantages of nearness to the sources of raw material, labour; availability of power and transport facilities and market. The subsidies and other concessions available at certain specified areas are to be compared with these basic infrastructure aspects.

### **4.3.2 Project location**

The most important factors that determine the selection of project location are the following:

- Availability of land (proper acreage and reasonable costs).
- The impact of the project on the environment and the approval of the concerned institutions for license.
- The costs of transporting inputs and outputs to the project's location (i.e., the distance from the markets).
- Availability of various services related to the project such as availability of extension services or veterinary or water or electricity or good roads ...etc.

### **4.3.3 Land and Building:**

The land should necessarily be sufficient to take care of future expansion. If the land is on lease, the terms and conditions of the lease to be verified and so also whether the municipal laws regarding construction of building are complied. Actual plant lay out is to be studied before deciding on the size of the building.

### **4.3.4 Plant and Machinery:**

The important aspect to be noted in examining the list of plant and equipments is to ascertain the appropriateness of the process of technology, capacity and the related sectional balances amongst various assembly lines.

It has to be ensured that the cost of equipment is based on proper quotations from suppliers and that suitable provisions have been made for insurance, freight, duty and transportation to site, erection charges and allied expenses. Adequate provision for spare parts is also essential especially if the same have to be imported.

### **4.4 Method of production**

The selection among a number of methods to produce the same commodity should be undertaken first. Factors that make one method being preferred to other method in agricultural projects are the following:

- Availability of inputs or raw materials and their quality and prices.
- Availability of markets for outputs of each method and the expected prices for these outputs.

- Various efficiency factors such as the expected increase in one additional unit of fertilizer or productivity of a specified crop per one thing

#### **4.5 Production Technique**

After we determine the appropriate method of production of a commodity, it is necessary to look for the optimal technique to produce this commodity.

- Determination of tools and equipment needed for the project such as drinkers and feeders or pumps or pipes ...etc.
- Determination of projects' requirements of constructions such as buildings, storage, and roads etc. in addition to internal designs for these requirements.
- Determination of projects' requirements of skilled and unskilled labour and managerial and financial labour.
- Determination of construction period concerning the costs of designs and consultations and the costs of constructions and other tools.
- Determination of minimum storage of inputs, cash money to cope with operating and contingency costs.

This assessment is based on an outline design of system requirements, to determine whether the company has the technical expertise to handle completion of the project. When writing a feasibility report, the following should be taken to consideration:

- A brief description of the business to assess more possible factors which could affect the study
- The part of the business being examined
- The human and economic factor
- The possible solutions to the problem

At this level, the concern is whether the proposal is both *technically* and legally feasible (assuming moderate cost). The technical feasibility assessment is focused on gaining an understanding of the present technical resources of the organization and their applicability to the expected needs of the proposed system. It is an evaluation of the hardware and software and how it meets the need of the proposed system

### **Project Appraisal-II (Economic Feasibility)**

#### **4.6 Introduction**

The current unit attempts to provide an understanding of the conjectural foundations of the method of economic feasibility analysis. However, a special emphasis be laid on developing insights into

their use at the Block level. Therefore, a clear bias in this unit towards providing an answer to the question, “How to carry out an economic feasibility analysis”?

#### **4.7 Economic Feasibility**

Economic feasibility analysis is a quantitative measurement of economic efficiency of feasible project variants. This analysis is carried out so that one of the variants could be chosen on the strength of its supremacy over the others.

Economic analysis serves to measure differences between alternatives and decrease them to a basis, which enables project comparison. The significance of the use of these methods, however, varies with the alternatives under consideration.

Thus, economic analyses involve techniques for compare and decide between alternatives on the basis of financial or economic desirability.

The use of these techniques is very important, for there is much to be gain or lost by virtue of the particular alternative chosen. Therefore, examine these concepts to develop answer to the question: How the economic analysis should be carried out?

#### **4.8 Economic Efficiency**

You must have realized by now that the central and final purpose of economic analysis of project proposals is to work out efficiency measures. Obviously, the question which arises here is: what are economic efficiency measures?

Economic efficiency is derived from the key categories of inputs and outputs of the project. A derivation becomes possible only when input and output quantities have been changed into their respective values by multiplying them with respective prices or unit values.

A necessary and indispensable condition for derivation of economic efficiency, consequently, is that the price or unit value of inputs, and outputs must be known.

Being a derived value concept, an economic efficiency measure represents or stands for a relation. At this point you must ask the question: What is this relation? Or alternatively, how is this relation expressed?

Fundamentally, this relation can be expressed in two possible ways:

- a) as a difference of value sums of inputs and outputs, and
- b) as a ratio of output to input value sums.

It clearly follows from this that for any project, there could be two fundamental measures of its economic efficiency, one given by the difference and the other by ratio of the relevant value sums. The first give the absolute measure, the second give the relative measure of a project's effectiveness.

When there are more than one project variants to choose from, and indeed this is the general case, it is the relative measure of efficiency that ranks the project variants according to higher and lower efficiency and enables the project team to choose that variant, which ranks first in the list.

i) **Differences in Efficiency Measures (Private and Social):** Different economic agents assess the same things differently because their goals, objectives or motivations are usually different.

Take for instance a dairy project where one of the projects is straw for feed. A peasant who participates in the project might have to buy a part of his straw necessary from other peasants at the active market price of straw in or around his village. The value of this input for this individual peasant is the quantity of straw purchased multiplied by the price paid.

Consider now the value of the straw input to the project from the angle of all the peasants, that is, from the angle of the society as a whole. Straw is a by-product of farming and it has hardly any other use. Therefore, for society, the value of the straw input to the project is almost nil.

The difference in the value of straw input alone will be different in the two cases. While in the first case, the estimate will give a measure of the project's private economic efficiency, in the second case, it will give its social economic efficiency. This type of difference occurs irrespective of whether the proposed investment in the project is wholly private, public or any shade between the two. All these types of project investments occur in our country because of the mixed economy with various forms of property ownership.

ii) **Public and Social Economic Efficiency Measure:** There is also a difference between public and social economic efficiency. The public is the same with the state and with that of the agencies of the state. But the state is not the same with society; therefore, the public and social are not the same. To further explain the difference, let us think of the projected investment in the dairy project the same as wholly public and let the project be run and managed by a public agency. The aim of the public agency is to produce and supply milk at competitive price to a city population, otherwise served by private suppliers. Straw is once again an input to the project.

The management, like the individual peasant, has to buy its straw input requirement from the nearby peasants at the prevailing market price in the area or buy it elsewhere and transport it to the animal shed in the project area. The value of this straw for the public management agency of the project, similar to that of the individual peasant, is the quantity purchased multiplied by the price paid.

But, for society, for the reason given earlier, the value of the straw input to this wholly public project remains nil. Therefore, for this difference in the value of the straw input alone, other things being the same, the public economic efficiency measure of the project would be quite different from its social economic efficiency measure.

In conclusion, we can say that for any project, there are different measures of its economic efficiency. These relate to the economic agents or institutions involved in the project, be they private, public or any other.

The same conclusion applies if output values are considered, since different economic agents and institutions may value the same project output differently.

There are some pure public investment projects belonging generally to social infrastructural sectors and to the field of science and technology, whose output and services are provided to consumers free and whose output are very difficult, if not impossible, to measure in value terms. The relevant measure in such cases is the social efficiency for choosing among the available variants. This is indicated by the comparative social costs of the variants under the supposition that the value for services from the variants is the same and equal to one, whatever meaning may be assigned to one. On this basis, the variant with minimum social cost is the most efficient.

#### **4.9 Costs and Benefits**

The focus of the foregoing discussion is clearly on the costs and benefits of a project. Costs and benefits of a project are derived from its input and output values. Differences in input and output values, according to the agents and institutions involved, naturally lead to differences in the private, public and social costs and benefits of a project. Therefore, a proper identification of the costs and benefits stream becomes the primary task for any project formulator.

At first it might appear to you that no matter who incurs them, input values together constitute project costs. Similarly, no matter to whom these accrue, all output values together constitute project benefits. There are, however, two factors, which make a difference. First, from the social angle, a negative output value, the value of socially undesirable or harmful product constitutes a social cost of the project. A negative input value, therefore, constitutes a social benefit.

Second, from the private and public angle, besides input costs, the project may involve incurring of non-input costs on the one hand and receiving of non-output benefits on the other. Input costs are traditionally described as real resource costs to the material transformation process within the scope of the project.

Let us examine the concept of non-input costs and non-output benefits for easy identification.

- i) **Non-input Private or Public Costs:** The non-input private or public costs are of two types:
  - a) **Taxes and Duties:** Payments for rights of the state, such as excise and customs duty, royalty, sales tax, development duty, tax on profit, land revenue and payment for private rights like rents, patent charges and brand names.

- b) **Sales Promotion Charges:** Payments for promoting sales of project outputs like advertising and commissioning of marketing agents.

There is, however, much debate about the treatment of depreciation and interest charges on the instalments of loans, all of which give the appearance of being non-input costs from the private or public angles. Therefore, a proper approach in dealing with these items must be clearly described. Depreciation is a financial accounting mechanism employed by private and public industrial firms to show how much physical capital assets have been used during an accounting period. While management may record depreciation of an asset as a cost in its annual balance-sheet, it should never be forgotten that the cost of the asset (an input cost) was incurred at the time of acquiring it. The inclusion of depreciation charges in the private or public cost would, therefore, mean double counting of the input cost of the asset in point. Hence, depreciation is irrelevant for assessing a project's economic cost, public or social. But depreciation is very relevant for assessing the financial viability of a project, as depreciation charges are available to management as a source of funds.

Similar is the case of repayment of loan instalments. Since the cost of an asset has been incurred when acquiring it, showing repayment as costs would again mean double counting. Once again, however, repayment of instalments is relevant for analyzing the financial viability of the project. It should also be noted in this context that in the financial balance-sheet or in the cash flow statement of the project, while repayments of instalments are shown as expenditure, the loan amount outstanding is shown as receipts, thus avoiding double counting. In economic accounting, the asset cost simply takes the place of the equivalent loan.

Interest is truly a non-input cost, a payment for ownership rights of investible funds. Those who save and advance loans for investment in private or public projects must be compensated for the sacrifice of consumption, while they advance funds. But one of the central concerns for making a project economic analysis from the private or public angle is primarily to check whether the project would generate sufficient returns to be able to pay interest on the capital borrowed. Precisely for this reason, interest has to be kept out of the private or public economic cost of the projects. Adopting this practice, the project evaluator should be able to show that the project's private or public rate of return is greater than the relevant rate of interest. This would simply mean that the project is worthy of being undertaken.

- ii) **Non-output Private or Public Benefits:** You may, on the other hand, also find that some of the projects have non-output benefits from the private or public angles. These may be in the form of rebates and exemption from states taxes and duties of various kinds, subsidy on sales and procurement or purchase of output at a support price. Perhaps you can now



visualize the group of non- output benefits accruing to a private or public agency. You must also be able to understand the effect of such concession on the project output.

Well, the effect is an increase in the net value of project output compared with the net value. This takes place only if the net output value had been assessed at the open market price inclusive of taxes and without the subsidy and support through State purchases.

In brief, the private or public total cost of the project, thus, comprises direct input and non-input costs incurred by the private or public agency concerned.

The total benefits, on the other hand, comprise direct output and non-output benefits received.

The net of total benefit over total cost from the private or public angles gives us the net revenue, income, earnings, profit, surplus, etc.

The general rule, therefore, for getting at respective costs and benefits of the project is: Whatever is to be paid by way of input and non-input expenditures would go as costs and whatever is to be received by way of output and non- output revenues would be identified as benefits. These would be applicable to the private or public agency goals.

iii) **Social Costs and Benefits:** In regard to social costs and benefits of the project, you may face a situation that is simultaneously simpler and more complicated.

The process of identification is simpler because our attention is now confined to input and output related costs and benefits alone. There are no non-inputs costs and non-output benefits of the project from the society's angle.

The complication arises because input costs and output benefits have to be traced both directly and indirectly. It not only has to be directly incurred or generated by the project, but also indirectly, elsewhere in the economy, by other projects, as a consequences of this project's presence. These are generally described as external effects, which may be external economies or diseconomies.

The accompanying Table below has been designed in a format especially for the Block level planner. The Table facilitates easy identification and accounting of social costs and benefits of project.

**Table: Identification and Accounting Table for a Project's Social Costs and Benefits**

Item Number	Item of Costs and Benefits	Illustrative Example	Remarks
1.0	<b>Input Costs</b> (inputs used)		
1.1	<b>Direct</b> Input use		For the production of the project outputs

1.2	Indirect input use	Pollutants and cost of their neutralization	For prevention of neutralization of harmful output
1.2.1	By the project internally		
1.2.2	By other project externally		
2.0	<b>Input Benefits</b> (inputs saved)		
2.1	<b>Direct</b> Saving of input out of displaced project	Feeds used for indigenous cow when the latter is displaced by crossbred cow	This benefit accrues to the project
2.2	<b>Indirect</b> Saving of inputs other by projects externally	A canal project's effect in reducing operating inputs of existing tube-wells in the command area due to rise in water tables	This benefit accrues to other projects
3.0	<b>Output Benefits</b> (desirable output generated)		
3.1	<b>Direct</b> Output of primary goods or services from the project		
3.1.1	Output of <b>Secondary</b> goods or services from the project	Education, health, housing facilities for workers at the project site, on job skill formation, i.e. learning by doing, use of the project road by local inhabitants, otherwise meant for carrying materials to the project site	These benefits may partly accrue internally to the project and partly externally outside the project
3.2	<b>Indirect</b> Increase in output or output value of other project for the same levels of input use	Increase in precipitation or soil Conservation resulting from an afforestation project and, in turn increasing agricultural yield in the vicinity, extension of railway line through an agricultural region.	This benefit accrues externally to other projects.
4.0	<b>Output Costs</b> (undesirable outputs generated or desirable output costs)		
4.1	<b>Direct</b>		

4.1.1	Output of undesirable products from the project	Pollutants and effluents from industrial projects, milk and manure from indigenous cow displaced by crossbred cow, fish catch by traditional sail boats. displaced by mechanized trawlers, earthen pottery by China clay pottery, etc.	The cost to prevent harmful effects may or may not be incurred either internally or by other projects. If it is actually incurred then it is accounted under item No's 1.2.1 and 1.2.2
4.1.2	Loss of output of displaced project		
4.2	<b>Indirect</b> Loss of output by other projects	Loss of agricultural output from waterlogged agricultural land as a result of canal irrigation project	
5.0	<b>Total Social Cost:</b>	$[(1.0+4.0) - (1.2.1+1.2.2)]$	Provided cost items 1.2.1 and 2.1.2 have been accounted under 1.0
6.0	<b>Total Social Benefits:</b> (2.0+3.0)		
7.0	<b>Net Social Benefits:</b> (6.0 – 5.0)		
8.0	<b>Displaced Net Benefits:</b> (4.1.2 – 2.1)		These are directly displaced by the project
9.0	<b>External Social Costs:</b> (1.2.2+4.2)		
10.0	<b>External Social Benefits:</b> (2.2+3.2)		
11.0	<b>External Net Benefit:</b> (10.0 – 9.0)		
12.0	<b>Net Social Benefit of the project</b> (7.0) – (3.1 – 1.1)+ (10.0 – 9.0) – (8.0)		The net social benefit is the direct net benefit of the project plus the direct net external benefit minus the net benefit displaced by the project

The Table is self-explanatory and illustrative. Some basic facts, however, need to be pointed out, these should be kept in mind, while identification is carried out for social costs and benefits.

First, the pattern of social benefits differs with the nature and type of projects.

Second, the actual amount of cost or benefit shown against specific item heads for any project, especially under the indirect external costs and benefits category, may turn out to be negligible or nil. Some of these may not even be measurable or may be difficult to measure. It should not be deleted beforehand, as it is likely to cause incomplete identification and one may indeed miss the significant social costs or benefits of the project.

Third, it is in general difficult to keep within narrow limits the external social effects of a project, because, any new project is like a pebble thrown into a pond, which causes waves all around. The maximum impact is naturally felt around the point of impact. As one moves away, the waves become weaker and the impact declines, until it becomes imperceptible. Similar are the social external spread effects of project. For social cost benefit calculations, even if the circle effects are captured, this would not be a mean achievement.

Finally, the statement in the last row of the Table provides a check on the statement in row (7.0), which gives the net social benefit of the project.

#### **4.10 Role of Time in Economic Appraisal**

Time is an essential feature of almost every aspect of a project. As we have seen in a preceding unit, every project has an economic life starting with the first year of construction and extending up to the year in which it is scrapped.

At the time of preparing its blue-print and its appraisal, its life lies wholly in the future. This means that project inputs, outputs and also direct or indirect costs and benefits are all future dated.

The project profile is accordingly a future time sequence of inputs and outputs, of costs and benefits running over its life. There are two immediate consequences of this feature of the project profile. These consequences, therefore, must be properly assessed.

#### **4.11 Present and Future Economic Values**

This consequence pertains to costs, benefits or their components, even of same amounts, but occurring at different dates because they do not have the same present value. Let us explain this concept of present and future values with some illustrations.

- i) **Present value:** The present value series are independent of time and, therefore, ordinary arithmetical operations can be performed with ease.

This being the case, the sum of the present value series of costs and benefits gives us the total present value of the project's costs and benefits. The difference between the benefit and cost sum gives us the present value of net benefits or net present value of benefits. Therefore, when we are assessing the social costs and benefits of a project in the format of Table 4.1, this table will have a time dimension column at its right, giving how many years the project's life is expected to be. When the entries in each row have been discounted at the social rate of discount, we shall have the corresponding present value series.

The sum of this series will give us the total present value under respective heads. It is easy to see that the sum of the present value series corresponding to row (7) or row (12) of Table 1 will give

us the net present value of benefits of the project. Exactly similar is the case when project costs and benefits are viewed and estimated from the private or public angles. But the question remaining to be answered is, how does one obtain a present value series of costs and benefits when the project life lies in the future?

- ii) **Future value:** Just as the saying goes that a bird in hand is better than two in the bush, a rupee's worth of benefit received five years hence (from now into future) has far less value than if received now. The farther away in the future a rupee of benefit lies, the lower is its present value. The position is the same with respect to cost, which is actually negative benefit. And it happens because all of us – individuals, institutions and even society as a whole – discount the future *vis a vis* the present.

In other words, we attach less and less weight (importance) to a unit of benefit or cost the farther and farther it occurs in the future, and the rate at which these weights decline is called the rate of discount. Private individuals with a limited span of life discount the future at a rate higher than that at which society or government would do. Such a difference in discounting of future gives rise to different private and social rate of discount.

The future time sequence of project costs, benefits and their components, whether private, public or social can, therefore, is converted into a corresponding present value series, provided we are given the relevant rate of discount.

Now, the most important question in the process of project appraisal revolves around the discount rate. One has, therefore, to decide as to what rate of discount should be utilized.

So far as private and public discount rates are concerned, the rates of interest at which the public project agency, private individuals, households or firms would borrow or lend investible funds, in part or whole, provide the appropriate substitutes for these rates of discount. For illustration, suppose a State government or a public sector agency borrows investment funds for a project from the National Bank for Agriculture and Rural Development (NABARD) and, in turn, relends a part of the borrowing to rural households, which show their keenness to participate in the project by agreeing to make the complementary private investment, partly financed by their own savings and partly by loans.

Let us further suppose that the borrowing rate of interest is 5 per cent and the relending rate is 7 per cent. Therefore, it can be said that relevant rate of discount for public costs and benefits of the project is 5 per cent, whereas it is 7 per cent for the private costs and benefits.

**Why is it so?**

This is because the relevant discount rate is the corresponding interest rate working in reverse. For a 5 per cent rate of interest Rs. 100 (present value) will become Rs. 105 a year from now (future value). On the reverse, Rs. 105 at cost (benefit) a year from now, at 5 per cent rate of discount will be worth Rs. 100 now.

Another point worth noting is that the value of the discount factors is indeed the weight attached to a unit of future cost or benefit by the parties concerned.

When it comes to finding the present value of future social costs and benefits of the project, we require a social rate of discount. This also is national parameter, the value of which is supposed to be given by the national planning agency. In the event that the national agency fails to give a single value of this parameter, the project team should use a range of values.

### **Uncertainty about Estimates**

The second consequence is that an area of uncertainty would exist around the estimate of almost everything of relevance to the project, be it the construction period, the economic life of the project, estimates of inputs, outputs, prices, costs, benefits or their components. Given the knowledge, experience and information available, the project team, it is assumed, would try to prepare the best estimates of the quantities and values involved.

It has been observed that the best estimates go wrong more often in respect of cost and benefit values, which, among other things; depend upon prices of inputs and outputs. The price of an input may shoot up in future due to unforeseen causes, pushing up the investment or the operating costs as the case may be. Similarly, the demand for the project output may fall and push down its price, reducing the output benefit in the process. It must be admitted that by the very nature of uncertainty problem, there is no readymade formula or completely satisfactory method to handle it. All that one can possibly do is to ask (i) how badly the present value of net benefit of the project will be affected because of the uncertainty surrounding the estimate of any one of the variable or a whole set of variables and (2) whether the project would still remain within the acceptable range.

In operational terms, this means performing a sensitivity test on present value of net benefit with respect to possible change – anticipated on the basis of objective information and one's subjective judgment – that are likely to occur in the estimate of one or other variable as a result of uncertainty surrounding the variable. This is known as sensitivity analysis. This analysis, however, is not suited when uncertain effects of many variables have to be considered simultaneously because uncertain effects get compounded. These can be compensatory or self-cancelling. Nevertheless, uncertainty remains.

According to this test, for a relative change in the estimate of an uncertain variable, say 5, 10 or 20 per cent change upwards or downwards, as the case may be, you have to recompute, other things remaining unchanged, the present value of net benefit. Supposing a 5 per cent change in the variable's estimate makes a 20 per cent change in the present value of net benefit, the conclusion is that the project is highly sensitive to future changes in this particular variable.

On the contrary, if the change in the present value of net benefit is of a minor magnitude so that it does not affect either way the viability of the project, the obvious conclusion is that it is insensitive. Where sensitivity is high, the project may require recasting or may even be abandoned if the changed present value of net benefit becomes negative.

#### **4.12 Choice of Economic Efficiency Indicators (Decision Criteria)**

You may recall that there are two types of economic efficiency measures, viz., absolute and relative. Therefore, it becomes pertinent to examine the merits and demerits of different indicators. This examination will equip you with skills to choose the right indicator of economic efficiency, which would result in the ultimate selection of your project proposal. Thus you must be fully equipped to know 'when' and 'where' to use 'which' indicator.

##### **4.12.1 Present Value of Net Benefit (PVNB)**

The present value of net benefit is an index of economic efficiency of investment project. As already noted earlier in the present unit, the present value series of project costs and benefits give us an absolute measure of worthiness or efficiency of the project in point. So long as our attention is confined to a single project, or two or more projects whose present value of costs (PVC) are the same, this index or criterion of choice among projects remains adequate.

But in the more general case, when there are many projects with different PVCs, this absolute measure fails to produce a correct choice among project variants.

##### **4.12.2 Benefit-Cost Ratio (B/C Ratio)**

In the case of more than one competing projects with different costs, a relative measure of efficiency or index of worthiness becomes necessary for making the right choice. The ratio of Present Value Benefit (PVB) to PVC, in short, the benefit-cost ratio (B/C Ratio), provides such a measure. It essentially gives the benefit per unit of cost.

The benefit cost ratio criterion states the following decision making rule:

- i) In the case of single project, choose it if its B/C ratio is one or greater than one.
- ii) In the case of many projects, rank the projects in descending order of their B/C ratio.

##### **4.12.3 Internal Rate of Return (IRR)**

It should be noted that the present value of net benefit, and so also the benefit cost ratio of a project, can be estimated only if appropriate rates of discount are known or given. In a situation where the social rate of discount is not given, the only alternative left for the project team is to discount the time sequence of social costs and benefits at rates of discount upward of zero and find, at each rate, the difference between the sum of PVB and sum of PVC, or in other words, NPVB. If, at a particular rate of discount, one finds NPVB to be positive, one chooses the next higher rate of discount and finds the corresponding value of NPVB again. The process is repeated until that rate of discount is reached at which NPVB equals zero. This rate of discount is called the Internal Rate of Return (IRR) of the project.

### Why is it known as Internal?

Internal, because it emerges peculiarly just from the cost benefit data of project, external aid not being necessary, as in the case of the first two criteria.

### Why Rate of Return?

Rate of return, because it is indeed per unit yield on the investment cost of a project. IRR, as a criterion of choice among competing projects, suffers from two shortcomings.

- i) It is biased in favour of quick yielding projects.
- ii) The choice is not always consistent with the choice made on NPVB or B/C ratio criteria.

Let us illustrate these shortcomings. Suppose there is a provision of Re. 1 of investment and there are two alternative projects A and B. A is quick-yielding and offers Rs. 3 of benefit in the third year, while B is a long-gestation project with a promise of Rs. 10 of benefit in the tenth year. The IRRs, of A and B, alongside their NPVB and B/C ratio at 15 per cent social rate of discount, is given in Table.

**Table: IRR, NPVB and B/C Ratio of Alternative Projects A and B**

Year	(0)	(1)	(2)	(3)	.....(10)	IRR (Percent)	At 15% Social Rate of Discount	
							NPVB	B/C (Rs.)
<b>Project A</b>								
1) Investment cost (Rs.)	1	0	0	0	.....0	44.0	0.97	1.97
2) Benefit (Rs.)	1	0	0	3	.....0			



<b>Project B</b>								
1) Investment cost (Rs.)	1	0	0	0	.....0	25.5	1.47	2.47
2) Benefit (Rs.)	0	0	0	0	.....10			

According to the IRR criterion, the quick-yielding project A should be chosen, as it offers a higher IRR. This choice is, however, contradicted if the choice was made on NPVB or B/C ratio criteria as, according to these, the project B should be chosen.

Even apart from these shortcomings, IRR by itself does not provide a complete decision rule for affecting a choice. For it requires a standard of comparison, a predetermined private or social rate of interest at which the investment funds are borrowed or made available. Thus, overlooking its already discussed shortcomings, IRR is a suitable criterion of choice only among those projects, which depend upon borrowed funds at stipulated rate of interest.

It is very pertinent now to sum up and demonstrate how in a sequence of steps, a project team can assess the economic efficiency of projects in practical cases. **The steps are as follows:**

**Step 1:** For any technically feasible project belonging to a non-social service infrastructural sector, identify and list the private persons and institutions required to make complementary or supplementary investment in the project besides the public sector institution that would be in charge of public sector.

**Step 2:** For a technically feasible project belonging to the social service infrastructural sector, go straightaway to step (7).

**Step 3:** Following step (1) prepare year-wise sequences of costs and benefits over the expected life of the project separately for each institution in the list. If the number of private persons and institutions to be involved is large, select a typical case or representative person and institution from each group and prepare the cost and benefit statements only for them. When both poor and non-poor private persons and institutions are involved, select one typical or representative case from each of these groups for this purpose.

**Step 4:** For any year of project life, assess the input cost and output benefits at the base year constant prices of inputs paid and outputs received.

Then, add to these the expected non-input costs to be incurred and the expected non-output benefits to be received by the typical person or institution concerned.

**Step 5:** For a typical person or institution concerned, discount cost and benefit sequences at the rate of interest at which loan is to be given or funds borrowed to meet the whole or part of the investment requirement.

**Step 6:** For every typical representative person and institution involved, calculate NPVB and B/C ratio using the discounted series of corresponding benefits and costs.

**Step 7:** Prepare a year-wise sequence of social costs and benefits over the expected life of the project with the help of the format given in above Table.

Note that all inputs used or saved and all outputs generated or displaced, irrespective of the persons and institutions concerned, private or public, have to be included in assessing the social costs and benefits.

**Step 8:** For any year of project life, assess the values of social costs and benefits at the base year with constant market prices of the inputs and outputs, but these prices should be net of all commodity taxes, excise, customs duty, sales tax, etc.

**Step 9:** Discount social costs and benefits at rates of discount greater than zero. At each rate of discount, work out the social NPVB and B/C ratio. Continue the process until NPVB equals zero and B/C ratio equals one.

**Step 10:** Replace market prices of inputs and output by their respective social (accounting or shadow) prices and repeat step (7 to 9). If the ratios of social to market prices are available, the social values of the corresponding inputs and outputs are obtained by multiplying the amounts assessed at market prices by the respective ratios. Frequently, not all market prices may have to be replaced. In fact, the focus should be on material inputs, unskilled labour and foreign exchange components of inputs and outputs.

**Step 11:** If it is possible to estimate the share of savings in NPVB as computed at social prices, work out present value of aggregate consumption, provided, of course, that the shadow prices of investment have been given by the national planning agency. If these are not given, skip this step.

**Step 12:** If project investment is already earmarked for the poor, step 11 can be omitted. This is because projects for the poor will compete only among themselves for the funds earmarked for such projects. The relative positions of the competing projects remains unchanged.

**Step 13:** Perform sensitivity tests on NPVB as computed through step (10) with respect to uncertain variables to make sure that, in spite of uncertainty, it will remain positive, this step should be carried out immediately after step (10).

In these 12 steps, the appraisal of economic efficiency of the project should be completed. It must, however, be noted that the estimates of socio-economic efficiency measures of the project, be it NPVB, B/C ratio or IRR, made steps 7 to 10, would have incorporated the project's contribution to

the three major plan objectives: increased income, increase in employment and national self-reliance.

NPVB is an index of increased income, so also are the related indices, B/C ratio and IRR. Social prices of unskilled labour and foreign exchange take care of the contribution to employment and national self-reliance objectives respectively.

## **Project Appraisal III (Financial Feasibility)**

### **4.13 Introduction**

This unit is the third in the project appraisal. The unit in itself is important as the central focus is on cash - the cash, which flows into the project and the cash, which flows out of the project. A detailed examination of various issues will sharpen your analytical capabilities. Such capabilities, as we shall see in the next block, will also pave the way for better management. Thus, the precision and the skill in using decision rules will ultimately result in better planning for rural development.

At the outset, it is natural for you to ask the question, "What is financial feasibility or viability?" In a simple way, financial viability may be defined as the capacity of a project to meet or pay for its cash obligations or liabilities.

When do the cash obligations arise?

Well, the cash payment obligations arise when private or public economic agents involved in the project borrow funds for meeting the whole or part of their investment and operating costs.

If an agent meets costs wholly out of its own funds, the question of appraising the financial viability of the project from the angle of this particular agent simply does not arise, since its economic efficiency measures would alone suffice to guide a decision.

It has been observed that generally an economic agent intends or decides to borrow funds only when he hopes to make enough earnings out of the projects.

The agent should be able to pay back the borrowed funds on creditor's terms.

Therefore, it should be clear to you that the problem of financial viability arises only when the project is expected to generate cash incomes in the hands of the private or public agents. And, these agents depend upon borrowings to meet their investment and/or operating costs.

To further elucidate the point, consider a promotional or infrastructural service project where private agents make complementary investment. There is a loan provision as well for the private agents before they can reap the benefits of the project. Here, it becomes necessary to appraise the project's financial viability from the angle of these private agents. For example, consider an Integrated Cattle Development Project operating in a rural area. The public sector, under this project, is to provide artificial insemination (AI) and health cover either free or at a nominal charge.

There is a provision of financial assistance in the form of a bank loan to the rural households of the area for the purchase of a good quality she-buffalo or cow. The main aim of the project is to enhance milk production in the area. The public sector, by way of incentive, has the provision for a small amount of subsidy on this investment. There is no point in appraising the financial viability of a project like this from the public angle, whereas such an appraisal is extremely necessary from the angle of private households.

On this basis, there would be any number of plan projects financed out of public sector resources that do not need a financial viability appraisal from the public angle. This is so, primarily because these are not revenue earning projects, e.g., projects especially meant to meet the social consumption needs (Minimum Needs

Programme projects). Promotional and extension service projects would not call for a financial viability appraisal from the public sector's viewpoint.

#### **4.14 Purpose of Financial Feasibility Analysis**

For investors to engage in a new investment project, the project has to be financially viable. Invested capital must show the potential to generate an economic return to investors at least equal to that available from other similarly risky investments, i.e. the return on investment needs to be equal or higher. For example, an investor expects a manufacturing facility to generate sufficient cash flows from operation to pay for the construction of the facility and ongoing operating expenses and, additionally, have an attractive interest rate of return. Estimates of the cost of operating and maintaining a manufacturing plant, as well as expected income generated, are therefore essential in determining the financial feasibility of the facility (Bennet, 2003). Financial feasibility analysis is an analytical tool used to evaluate the economic viability of an investment. It consists of evaluating the financial condition and operating performance of the investment and forecasting its future condition and performance. A financial decision is dependent on two specific factors, expected return and expected risk, and a financial feasibility analysis is a means for examining those two factors put forward a number of reasons to conduct a financial feasibility study:

- Gives focus to the project and outline alternatives;
- Narrows business alternatives;
- Identifies new opportunities through the investigative process;
- Identifies reasons not to proceed with the project;
- Enhances the probability of success by addressing and mitigating factors early on that could affect the project;
- Provides quality information for decision making;

- Provides documentation that the business venture was thoroughly investigated;
- Helps in securing funding from lending institutions and other monetary sources;
- Helps to attract equity investment.

#### **4.15 Characteristics**

The foregoing discussion has implicitly mentioned various features of the financial viability techniques for appraising a project. We will, however, explicitly discuss three main characteristics of the financial viability analysis, since our discussion on indicators solely depends on its clear identification and understanding.

##### **1. Commercial Angle**

A project, which poses financial viability problems and demands an appraisal, necessarily has a purely commercial focus or angle. This is because a public or private agency, which borrows funds to purchase project inputs, must sell the project output and earn cash income to be able to pay back the borrowed funds along with the interest. A commercial success or profitability is, thus, an essential precondition of a project's financial viability.

##### **2. Partial Commercial Angle**

A project depending upon borrowing need not, however, be 100 per cent commercial in the sense that all its inputs are purchased and all of the outputs sold. In our earlier illustration of the cattle development project, a rural family may buy a cow or a she-buffalo out of the loan advances, but the labour of upkeep and part of the animal's feed may be the family's own. On the other hand, the family will seldom sell all the milk produced. A part is invariably retained for self-consumption even if it is only for the infants and the sick. The larger the part retained in this manner, the smaller will be the cash income received and lower the financial viability. This does not mean that the part retained for self-consumption is not a benefit of the project.

The economic worthiness of the project, inclusive of retained benefit, may be high from both the private family and social angles. However, it may, on the other hand, turn out to be a commercial failure and financially an unviable proposition. It becomes clear, therefore, that a loan-based project ought to be appraised for financial viability even when it has been judged worthwhile by the economic efficiency criteria from private, public and social angles.

##### **3. Cash flow Statement**

You may be aware that any project involving commercial transaction with borrowed funds in different proportions will have a flow of cash. Therefore, a cash flow statement tells you about the health of the project. It is a crucial characteristic. Perhaps you may be tempted to ask the question, why is it a crucial characteristic?

The answer is not difficult to seek. The cash account of the project in question is the main instrument for appraisal of financial viability. There would be at least two cash accounts of the project, mainly because of the commercial nature of the transaction involving loan funds. The first may be for the public sector authority and the second for the typical or representative private household.

Each account will tell us about the financial viability of the project from the angle of the two agencies concerned.

Therefore, a year-wise cash account running over the lifetime of the project is called a cash flow statement. By its very nature, this statement is a forecast of likely cash receipts and cash payments of the agency concerned for each year of the project's life.

i) **General guiding principle:** The general guiding principle for preparing a cash flow statement is that of inflow and outflow of cash, no matter on which account an inflow or outflow actually occurs. For example, a rupee of cash received or retained, whether out of own funds, borrowing(s), subsidy, sale of output or of an input like an old machine, is an inflow. Similarly a rupee of cash paid, whether as repayment of loan, instalment or interest for the purchase of project inputs, by way of taxes and levies, or as loan advances to third parties, becomes an outflow. It is important that the cash flow statement should be made as comprehensive and detailed as the project team can possibly make it. However, it has to be ensured that the forecast of each item of inflow and outflow has been made reliably.

ii) **Purpose:** A cash flow statement serves two purposes: First, it tells us what the annual financial position of the agency concerned will be, based on the net inflow. The net inflow is the cash in hand and is obtained on deducting the outflows from the inflows. The net inflow can also be used to initiate certain remedial measures. For example, revision of the schedule of loan repayment, making arrangement of a larger level of working capital in some years and so on.

The net inflow is most likely to be negative in the initial years of a project's life. It could be because there may be more outflow than inflows in the period of construction. Once, however, the project has begun to yield cash income, the expected positive net inflow may be indicative of the financial soundness of the project. Such a position also indicates that loan liability is also being regularly met.

Second, by choosing relevant items from the inflow and outflow segments of the statement, one can work out indicators of financial health in the form of ratios and rates. A number of such ratios and rates are computed by industrial firms to assess the health of the firm from different angles. The rural development project authority, however, should compute a few key indicators of financial viability during the appraisal stage.

#### **4.16 Conducting Financial Feasibility**

Analysis Financial feasibility analysis is conducted by developing a base case financial plan and assessing the sensitivity of the profitability of the project, and the projected return, on the investor's equity to various contingencies. Computer modeling is usually needed for analyzing these factors and can also be used in sensitivity analysis to analyze fluctuations in product price, changes in operating and maintenance cost, the effects of cost overruns, delay in completion, interruptions of project operations and other significant factors. (Finnerty, 1996) When conducting a financial feasibility analysis, the analyst must start by making certain assumptions about the investment project. As the project gets closer to reality, the assumptions become more accurate and reliable, and thus also the analysis. If a reasonable change in an assumption could make the project change from successful to unsuccessful, the assumption should be considered a key element. Hard facts should be clearly distinguished from assumptions, and the sources for the facts and the rationale for key assumption noted (Matson, 2000). Helfert (2001) states that the effort spent on taking the critical first steps at the beginning of the analysis will pay off in more focused and meaningful work and results. He proposes that the following should be considered before a financial feasibility analysis is conducted:

1. Nature and scope of the issue being analysed;
  2. Variables, relationships and trends likely to be beneficial to the analysis;
  3. Use "ballpark" estimate of results to determine critical data and steps;
  4. Precision is necessary for the analysis;
  5. Reliability and uncertainty of available data;
  6. Format of input data (cash flow or accounting);
  7. Limitations of tools applied, and how these will affect the results;
  8. Importance of qualitative judgments in the context of the issue, and how they rank in significance.
- By reviewing and considering these points, the analyst will gain a deeper understanding of the task at hand, and more effort can be directed at areas where the most payoffs can be achieved from additional analysis using the following outline when conducting financial feasibility analysis:

- Estimate the total capital requirements – seed capital, capital for facilities and equipment, working capital, start-up capital, contingency capital, etc;
- Estimate equity and credit needs - identify equity sources and capital availability, identifies credit sources, assess expected financing requirements, and establish debt to equity levels;
- Budget expected costs and returns of various alternatives – estimate expected cost and revenue, the profit margin and expected net profit, the sales or usage needed to break-even, the returns under various production, price and sales levels, assess the reliability of the underlying assumptions of the financial analysis, create a benchmark against industry averages and/or competitors, identify limitations or constraints of the analysis, construct expected financial statements, etc.

As seen from this outline, financial feasibility analysis requires detailed information regarding the project operations and financial requirements. In addition to this, considers the marketability of the project's output (price and volume) the primary influencing factor on whether the project will be financially viable or not, given the assumption that the project will be completed on schedule and within budget. He therefore thinks that it is very important to conduct a market study and use the results as an input for the financial feasibility analysis. The results of a financial feasibility analysis are only as reliable as the data used as input for the analysis. Data has to be collected from the project's owners and from outside sources, and often specialists within the field of the project are needed to make estimates and forecasts, in order to get as accurate assessment as possible. The degree of precision in the input depends on the specific situation and it is often preferable to develop ranges of potential outcomes rather than precise answers.

#### **4.17 Criteria for Financial Feasibility or Indicators**

The three most commonly used key indicators are **payback period**, **average return on investment**, and **financial rate of return**. The last one, namely, financial (internal) rate of return is worked out by using the discounted cash flow technique.

The objective in all these indicators is to compare the future benefits with the present investment costs. The basic methodology common to all the indicators is as follows:

- i) The annual net cash inflows are, in different ways, aggregated for arriving at a single number that indicates the benefits accruing from the investment.
- ii) The benefit that the investment must yield to justify the allocation of funds is predetermined as a 'threshold' number.
- iii) The number obtained in (i) is compared with the number obtained in (ii) to decide the acceptance or rejection of the project proposal.

These basic methodological steps remain unchanged for all the three indicators.



However, they differ in the manner in which the aggregation of benefits is done.

#### 4.17.1 Pay Back Period (PBP)

This measure indicates the number of years the project will take to repay its investment cost. In other words, PBP is the length of time between the starting time of the project and the time when the initial investment is recovered in the form of yearly benefits. This period is also called the recovery or recoupment period. Hence, the shorter the payback period, the more viable the project is. It is easy to compute the PBP from the cash flow table using the following formula, if the net cash inflows are the same every year:

$$\text{Pay Back Period} = \frac{\text{Investment Costs}}{\text{Average Annual Surplus}}$$

In case the cash inflows vary from year to year, the PBP is computed by finding the time point where the cumulative total of net cash inflows is exactly equal to the initial investment. Therefore, the aggregation consists of simple addition of net cash inflows up to the time point at which this total of net cash inflows is equal to the initial investment.

Clearly, the PBP provides information about the relationship of net revenues to investment cost, particularly in projects where the output prices are comparable to average or marginal costs and are not grossly subsidized, taxed or administered.

In practice, the time period within which the invested amount is to be recovered is decided in advance. The computed payback period is, then, compared with this predefined desired period.

The decision rule says that we should accept the project if its payback period is less than or equal to the desired PBP, otherwise reject it. Between two projects having PBPs shorter than the desired PBP, the one with the shorter PBP is preferred.

We can demonstrate the computational steps involved in estimating the PBP.

We give an illustration using hypothetical data. The illustration has deliberately avoided complications like subsidy, loan, equity capital, etc. in the computation.

**Illustration I** (When the annual cash inflow is uneven): The initial investment for a project is Rs. 10,000. Its time horizon is four years and the net cash inflow are Rs. 1,500, Rs. 3,000, Rs. 9,000 and Rs. 27,000 in the first four years. Now you are asked to compute the payback period. The first step is to make a table as follows

#### Pay Back Period Computation

Year	Initial investment (Rs.)	Cash Flow (Rs.)	Cumulative Cash Inflows (Rs.)
(1)	(2)	(3)	(4)
0	10,000	-	-

1	-	1,500	1,500
2	-	3,000	4,500
3	-	9,000	13,500
4	-	27,000	40,500

You can see in column (4) that the cumulative cash inflows are Rs 4,500 and Rs. 13,500 respectively at the end of the second and the third year. This is indicating that the payback period is between second and third year. In order to arrive at the period more precisely, you must assume that the cash inflows are uniformly distributed within a year. You need to recover the additional Rs. 5,500 (Rs. 10,000 – Rs. 4,500) needed after Rs. 4,500 has been recovered in the first two years to equalize the initial investment of Rs. 10,000. Thus, the

Payback period of the project works out to be 2 years 8 months approximately.

The project will be accepted if the desired payback period is not more than 2 years and 8 months; otherwise the project will be rejected.

**Illustration 2** (When the annual cash inflow is even)

Initial investment = Rs. 100

Annual cash inflow = Rs. 50

Time horizon = 5 years

The payback period in this case is very simple to compute by the formula:

Investment Cost ÷ Average Annual Cash Inflow. That is  $100 \div 50 = 2$  years.

Since the time horizon is greater than the payback period, the project is accepted.

**4.17.2 Average Return on Investment (ARI)**

The average return on investment is a measure of aggregate benefits that the investment will produce. The desired ARI will reflect the bare minimum that will make investors commit funds for the project. The ARI is computed in four steps:

**Step 1:** Find the total cash inflows over the project life.

**Step 2:** Subtract the initial investment from the total cash inflows. This may be called the total net income over the project life.

**Step 3:** Find the average annual income by dividing total net income by the project life in years.

**Step 4:** ARI is the ratio of the average annual income to the initial investment.

The project will be accepted if ARI is larger than the desired number; otherwise the project will be rejected.

The main advantages of using ARI over PBP as an indicator is that it takes into consideration all the cash flows generated from a project during the project life.

Nonetheless, ARI does not distinguish between receipts or disbursement of funds at different points of time. Hence, it fails to discriminate between two projects, which have the same ARI, but differ in the timing of the cash flows.

Illustrations have been provided below to further clarify the points.

**Illustration:** Compute the average return on investment from the following data

Project life in Year	1	2	3	4	5	Total
Initial Investment (Rs.)	2,300	-	-	-	-	2,300
Cash Inflow (Rs.)	331	430	553	544	536	2,394

$$2,394 - 2,300 = 94$$

$$94$$

$$\frac{94}{5} = 18.8$$

$$18.8$$

$$18.8$$

$$\frac{18.8}{2,300} \times 100 = 0.82\%$$

$$2,300$$

The ARI has been computed at 0.82 per cent.

**Illustration:** Consider the data of illustration (3) and decide selection of one project based on the ARI index.

	Project A	Project B
Total Net Income (Rs.)	18,000 - 10,000 = 8,000	18,000 - 10,000 = 8,000
Average annual income (Rs.)	$\frac{8,000}{5} = 1,600$	$\frac{8,000}{5} = 1,600$
ARI	$\frac{1,600}{10,000} \times 100 = 16\%$	$\frac{1,600}{10,000} \times 100 = 16\%$

The ARI for both projects is 16%, which means that both are equally preferable. Here again, the decision will be based on the pattern of cash flows, which is higher during early years in project A than B. Since funds have alternative uses, you should prefer Project A.

### 4.17.3 Financial (Internal) Rate of Return (FRR)

The financial (internal) rate of return is similar to the IRR explained in the preceding unit on economic feasibility. It is obtained by discounting cash benefits and cost streams until the present value of the net cash income becomes zero. The FRR indicates the average annual percentage return on total investment and operating costs. It is also known as yield of an investment in a project, as it does not require the pre-specification of a discount rate.

It is important to note that interest charges should be kept out of operating expenses in this exercise because the purpose of the exercise is basically to see how the financial rate of return would compare with the rate of interest on loan. If the FRR of a project turns out to be larger than the rate of interest on loan, it is a clear indication of a financially viable project.

Conceptually, the yield of the NPV (net present value) as criteria for appraising investment decisions are superior to either the payback period or average return on investment indicators. Moreover, due to increase in cost of capital, it will become imperative to estimate the time value of money. This estimation is possible only by using the discounted cash flow indicators. Complex computations are involved in estimating any of the discounted cash flow indicators. This has encouraged common usage of indicators like the payback period and the average return on investment.

In order to facilitate computation of the FRR, you will need an electronic calculator. Alternatively, the interest rate and discount rate tables, if available, would serve the purpose. The procedure here is by a trial and error process.

You must experiment with different interest rates until you find the closest rate to equate discounted streams of cash inflows to cash outflows.

#### **Illustration 6** (When the cash inflows are uniform)

Consider a project with an initial investment of Rs. 10,000 generating a stream of cash inflows of Rs. 3,000 per annum for a project life of five years. What is the financial (internal) rate of return on the investment?

#### **Solution:**

$$\frac{10,000}{3,000} = 3.33$$

Determine an interest rate  $r$

Such that the present value of Re 1 per period (received at end) for five years is 3.33.

Read from the present value table for various values of  $r$  and  $n = 5$  for a rate of return giving 3.33 as the net present worth. You will notice that this exercise provides the answer as 15% (approximately), which is the internal rate of return.

#### 4.18 Acceptability criteria for the project

In the discussion on financial indicators, we have used certain criteria for decision-making. These can be summarized as follows:

- i) Given an initial investment and a set of future net cash inflows, it should be possible to arrive at a unique number to represent the benefits accruing from the investment.
- ii) It should take into consideration the entire cash flows spread over the life of the project or the time horizon. In the absence of this, the benefits might be understated.
- iii) It should give higher importance to the cash flows in earlier years as compared to those occurring in the later years of the project life. The reason for this, as we have seen, is that the cash flows received earlier could be reinvested.
- iv) The technique should be simple.

It must be admitted that an appraisal technique encompassing all these above mentioned desirable characteristics is difficult to construct. Based on our discussion, we have seen that payback period ranks high in (i) and (iv) whereas ARI satisfies, (i), (ii) and (iv). The FRR conforms to (i), (ii) and (iii).

The Net Present Value (NPV), discussed as one of the important economic efficiency indicators, can also be used as a financial viability indicator. The decision rule here would be the same, namely, accept a project if the Net Present Value of the project is positive. Otherwise, reject the project.

Let us take an illustration to demonstrate the concept of the decision rule. The data is from above illustration. Initial Investment is Rs. 2,300.

Year	1	2	3	4	5
Net cash inflow (Rs.)	331	430	530	544	536

If the discounting rate is 10 per cent, is it worthwhile to accept the project?

#### Computation of Net Present Value

Year	Cumulative net cash Inflow	Net Cash Inflows (Rs.)	Present value of Re. (1) received at the end (Rs.)	Present value of cash inflows (Rs.)
1	331	331	$1$ ----- = 0.909 $(1+0.1)$	$331 \times 0.909 =$ 300.879
2	761	430	$1$ ----- = 0.826 $(1+0.1)^2$	$430 \times 0.826 =$ 355.180
3	1291	530	$1$ ----- = 0.751 $(1+0.1)^3$	$530 \times 0.751 =$ 398.030
4	1835	544	$1$ ----- = 0.683 $(1+0.1)^4$	$544 \times 0.683 =$ 371.552
5	2371	536	$1$ ----- = 0.621 $(1+0.1)^5$	$536 \times 0.621 =$ 332.856
Total				1758.497

The net present value of the project =  $1758.497 - 2300.00 = -541.503$

Since the NPV of the project is negative, the project is not worth accepting purely on economic grounds. It is clearly demonstrated that in computing NPV of a project, the entire stream of cash flows generated during the project life is taken into consideration.

Besides, the weights decrease as the time increases (hence, the term 'discounting'). For example, when the discount rate is 10 per cent, the weight of the cash flow at the end of first year is 0.909, while that of cash flow received at the end of the second year is 0.826. Thus, using NPV as a criterion for admissibility of a project satisfies all the four characteristics mentioned above.

It is possible to distinguish between projects, which are not distinguished otherwise by using the criterion of PBP or ARI.

The financial feasibility analysis is carried out only when the project is expected to generate cash incomes whether in the hands of private or public agents.

Thus, a commercial angle is the highlight of the financial appraisal. Since the private or public agents borrow funds to meet the investment and operating cost, it becomes important to appraise the financial returns of the project in order to check if it would be viable or not. There are three financial indicators worked out from the cash flow statement, which is the main source of information. The indicators are the **payback period, the average return on investment and the financial (internal) rate of return**. The first two indicators are computed without discounting the

cash flow statement. The last one is purely based on the discounted stream of cash flows and denotes the inherent capacity of the project to generate returns. The net present value could be added as yet another indicator in this group. The decision rules are simple and applicable for selection of project from both categories, namely, infrastructural and non-infrastructural projects.

### **Questions:**

1. List out that technical feasibility analysis is a process undertaken to determine whether the project idea is worth proceeding with or not?
2. Write down the detailed analysis of technical feasibility analysis involved in evaluation of the project from all relevant angles?
3. What is the sequence of steps, a project team can assess the economic efficiency of projects in practical cases?
4. What do you mean by Economic Feasibility and Economic Efficiency of a project? Describe the project cost and benefit of economic analysis?
5. What do you mean by financial feasibility? Write down the criteria of conducting financial feasibility?
6. What are the characteristics or purpose of financial feasibility?

### **Suggested Readings**

- Katar Singh (2009), Rural Development: Principles, Policies and Management, SAGE Publications India Pvt. Ltd. Publication year: 2009
- H. D. Foth & I. M. Turk, Fundamentals of Soil Science, Wiley Eastern
- Bneerjee G. D, Srijeet (2012), Rural Entrepreneurship Development Programme in India, An Impact Assessment, Abhijeet publication

**CERTIFICATE COURSE IN RURAL MANAGEMENT**

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**UNIT 5: PROGRAMME IMPLEMENTATION (ACTIVITY PLANNING AND NETWORK ANALYSIS), MONITORING DEVELOPMENT PROJECTS AND PROJECT EVALUATION**

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**STRUCTURE**

**5.0 Objectives**

**5.1 Introduction [Programme Implementation (Activity Planning and Network Analysis)]**

**5.2 Project activities planning and scheduling**

**5.3 What is Network Analysis**

**5.3.1 Critical Path Method**

**5.3.2 Schedule Compression**

**5.3.3 What-if Scenario Analysis**



### **5.3.4 Resource Leveling**

### **5.3.5 Critical Chain Method**

## **5.4 Network Revision**

## **5.5 Introduction (Monitoring Development Projects and Project Evaluation)**

## **5.6 Definitions of Monitoring and Evaluation**

## **5.7 Design and Implementation of M&E Systems**

## **5.8 M&E Systems and Common Deficiencies**

## **5.9 Key Design Principles for Project Monitoring and Evaluation**

## **5.10 Evaluation Criteria**

## **5.11 The Limits of Project Management**

## **5.12 The Challenges of Outcome and Impact Monitoring and Evaluation**

## **5.13 Results-Based Monitoring and Evaluation**

## **5.14 Planning and Implementing a Project Monitoring and Evaluation System**

### **Questions**

### **Suggested Readings**

## **5.0 Objectives**

1. Networking is powerful tool of planning, scheduling and control.
2. Shows the inter-relationships of the activities of a project or a programme.
3. Minimises total cost where the cost of delays and cost of resources required to carry out the tasks can be measured
4. To explain the principles, objectives and processes of project monitoring and evaluation.
5. To provide guidelines on the principal requirements of a successful project monitoring and evaluation system.
6. To highlight results-based monitoring and evaluation and the key steps for implementation.
7. To provide sufficient understanding of the role of monitoring and evaluation in rural development, to be able to judge the effectiveness of existing project M&E systems, and the appropriateness of proposed project M&E designs.

## **Programme Implementation (Activity Planning and Network Analysis)**

## 5.1 Introduction

Project management is concerned with planning, implementing, monitoring and organizing the resources of an organization to complete some assigned duties, tasks and events in intended timelines. It can either be an on-going activity or just a one-time project. Project Management is applicable in multi-faceted fields ranging from IT to construction. However, the role of a project manager remains the same in all industries viz. to define project objectives and goals; to determine resources for the completion of tasks and to monitor the tasks to ensure completion of the project. A project involves several tasks and activities which should be well-planned and monitored for effective management. This is where **network analysis in project management** proves helpful. This management technique drives better decisions and it helps in ensuring smooth project completion within expected time, resources and budget. In this post, we'll understand network analysis in detail.

Project time management includes two high-level groups of processes for planning and scheduling project activities and tasks necessary for timely completion of the project.

**5.2 Project activities planning and scheduling** is the first process group of project time management. Developing the project implementation schedule is the second group. In this article we will review the planning and scheduling process group. We will talk about the key actions the project manager must take to undertake project activities planning and scheduling in an efficient manner.

To plan and schedule project activities and tasks the project manager needs to take the next five steps:

- Set up activities.
- Define relationships between activities.
- Estimate resources required for performing activities.
- Estimate durations for activities.
- Analyse the flow diagram

### **Step 1: Set up Activities**

The first step of project activities planning and scheduling requires the project manager to define what amount of actions and tasks are necessary for producing project deliverables in a timely manner. The input for this process will be the project deliverables statement. The project manager can use this document to define high-level activities that will be used later in creating the project implementation schedule. The project manager should also work on developing project activities templates that help simplify the process of project scheduling and planning.

In cooperation with experts and the project team, the manager should make project activities lists that will be the output of the process for project activities planning and scheduling. For each of the listed activities accurate milestones should be identified and approved. All the identified milestones should be gathered into a single milestones list.

### **Step 2: Define Relationships**

The next step for planning project activities and tasks requires the project manager to make a sequence of all the activities identified at the previous step. The manager will use project activities lists, the milestones list and the product scope statement to define relationships among the activities. With help of project management software that person can set up priorities for each of the project activities and make task sequences organized and sorted by importance and urgency.

There is also a need to define dependencies between the activities. Dependencies can be internal and external. Activities with internal dependencies refer to any actions that the project team will take to produce the deliverables within the existing working environment. Activities with external dependencies refer to non-project factors that define success of project-related activities.

Both types of activity dependencies should be identified and added to sequenced and prioritized activity lists. Once the relationships are defined, the project manager should update project activities templates, outline the dependencies and link them to the product scope statement.

### **Step 3: Estimate Resources**

At this step, the project manager needs to review stakeholder requirements and the product scope statement to estimate an amount of resources required for performing project activities and tasks. Also expert judgments and alternatives analysis should be used for this purpose.

The constraint of time needs to be considered when estimating activity resources. The project manager in cooperation with experts and the team should develop resource calendars and define types of required resources. Once all this information is collected and analyzed, it should be used to make a decomposition of activity resources categorized by types, priorities and time. This decomposition is critical to creating the project implementation schedule.

### **Step 4: Estimate Durations**

The final step in project activity planning and scheduling requires the project manager to define and estimate an amount of working time required for accomplishing each identified activity. This is about setting up durations for project activities and tasks. Durations will depend on 1) the amount of work effort and 2) available of activity resources.

The project manager should review the resource decomposition and project activities templates to estimate the number of work periods required for completing the identified activities and producing the deliverables. The output of this process is activity estimates that are linked to resource calendars. This information will be used later in developing the implementation schedule.

**Step 5: Analyse the flow diagram.** This is called Network Analysis.

### **5.3 What is Network Analysis?**

Network Analysis is a technique that is adopted in planning and controlling of unique and complex projects. It is a system of planning project outline by analyzing different activities associated with it. In network analysis, complex projects are broken down into smaller activities or tasks, which are then organized according to a sequence. Then, the order of tasks/activities is also decided according to a logical sequence.

In the process, a network diagram is also prepared whereby all project activities are represented visually. The diagram depicts the cost of various activities and establishes a relationship between various tasks. The process is helpful in different phases of project management from planning, controlling and coordinating to decision-making. It ensures that the project is successfully completed economically and much before the time while exploiting minimum resources. Hence, network analysis reduces operational cost, total time, wastage of resources and conflicts in projects.

For creating a final schedule, a schedule network analysis is completed using an initial schedule. Multiple techniques can be used to create the final schedule such as:

- Critical path method
- Schedule compression
- What-if scenario analysis
- Resource leveling
- Critical chain method

#### **5.3.1 Critical Path Method**

A critical path is the longest path in a network diagram. The following steps are carried out in a critical path method: Longest path is determined through the network diagram Earliest and latest time when an activity can start is determined Earliest and latest date when an activity can be completed is also determined

#### **Near-Critical Path**

A near-critical path is close in duration to the critical path. If the critical path and near-critical path are closer to each other in length, it increases the risk of the project. The project manager should focus on monitoring and controlling activities on both critical and near-critical paths to avoid any delays to project completion. FLOAT (SLACK) Floats are mainly of three different types:

1. **Total Float (slack):** The amount of time the activity can be delayed without delaying the project end date. Total float is considered as a primary type of float.
2. **Free Float (slack):** The amount of time the activity can be delayed without delaying the early start date of the successor(s)
3. **Project Float (slack):** The amount of time the activity can be delayed without delaying the externally imposed project completion date required by the management or by the customer. The float is an advantage for the project.

A float can be used by the project manager to:

- Effectively manage the project
- Achieve better allocation of resources

For example, if you have a new resource who is still learning and if you feel he will take longer to complete the task, you can allocate him to the activity which has maximum float. Thus, even if the activity is taking longer, it is less likely that the project will be delayed. The amount of float also indicates the time flexibility the project members may have for each activity. Formula for calculating float:  $\text{Float} = \text{Late Start (LS)} - \text{Early Start (ES)}$   $\text{Float} = \text{Late Finish (LF)} - \text{Early Finish (EF)}$  Either formula will give the same result.

### Using Critical Path Method

A forward and a backward pass need to be performed through the network diagram to determine the earliest and latest each activity can start and the earliest and latest each activity can finish. For the “early” figures, calculations are required from the beginning of the project to the end of the project, following the dependencies of the network diagram – a “forward” pass through the network diagram. For the “late” figures, calculations are required from the end of the project to the beginning, following the dependencies of the network diagram – a “backward” pass.

A few important points of critical path method include:

- There can be multiple critical paths for a project
- A project manager does not prefer to have multiple critical paths in a project as it increases risk
- The critical path can change during the course of the project

- If the float is negative, the project is behind schedule
- The critical path has zero float
- If the critical path has a negative float, corrective actions or changes are required to the project. In case if the project has a negative float, the project manager should compress the schedule

### **5.3.2 Schedule Compression**

The unrealistic time frame is one of the most common problems of any project. If the customer or stakeholders have requested for a date that cannot be met, or if the project has deviated considerably from the baseline, the project schedule requires compression. It is the responsibility of the project managers to push back, present options, and make sure the project is achievable by properly planning the project and using schedule network analysis techniques like schedule compression. The schedule compression technique helps in determining if the desired project completion date can be met and if not, what can be changed to meet the requested date. This can be done right at the project planning stage. This technique is also used during integrated change control to look at the impacts changes to other parts of the project (i.e. cost, scope, risk, resources, quality, etc) have on the schedule. The objective is to compress the schedule without changing the scope of the project.

#### **Fast-Tracking**

- This technique involves doing critical path activities in parallel that were originally planned in a series. Some of the disadvantages of fast-tracking are:
  - Results in rework
  - Increases risk
  - Requires more attention to communication

For example, using the network diagram shown here, which activity would you a fast track to shorten the project length. Assuming the dependencies are discretionary, activity H could be fast-tracked by making it occur at the same time, or in parallel with, activity G. Any other pair of activities on the critical path could be fast-tracked. Activities C and H could also be fast-tracked by having part of activity C done concurrently with activity H. **CRASHING** In crashing maintaining the project scope is important. This technique involves making cost and schedule trade-offs to determine how to compress the schedule the most for the least cost. Crashing always results in increased cost. It trades time with money.

### **5.3.3 What-If Scenario Analysis**

In creating a finalized, realistic schedule, it is helpful to ask “What if a particular factor changed on the project? Would that produce a shorter schedule?” The assumptions for each activity can change and, therefore, the activity durations can also change. One of the ways to calculate the effect of these changes is through a Monte Carlo Analysis.

### **Monte Carlo Analysis**

The outcome of the project is simulated by computer software in the Monte Carlo analysis. It is based on the three-point estimate (optimistic, pessimistic, and most likely) for each activity and network diagram. Following are the benefits of the simulation:

- It suggests the probability of completing the project on any specific day
- It suggests the probability of completing the project for any specific amount of cost
- It suggests the probability of any activity actually being on the critical path
- It suggests the overall project risk
- It is more accurate than other methods as it simulates the actual details of the project and calculates the probability.

Monte Carlo analysis help deal with “path convergence”, places in the network diagram where multiple paths converge into one or more activities, thus adding risk to the project. Monte Carlo analysis is also used as a risk management tool to quantitatively analyze risks.

### **5.3.4 Resource Levelling**

A resource-limited schedule is produced using resource leveling. If resources are limited, leveling lengthens the schedule and increases the cost and other constraints.

### **5.3.5 Critical Chain Method**

Critical Chain method uses a network diagram and develops a schedule by assigning each activity to occur as late as possible to still meet the end date. You add resource dependencies to the schedule, and then calculate the critical chain. Starting at the end date, you build duration buffers into the chain at critical milestones. These reserves, spread throughout the project, will provide cushions for delays in the scheduled activities. You manage these buffers so that you meet each individual milestone date and thus the project milestone completion date as well.

### **Project Schedule**

The schedule can be shown with or without dependencies (logical relationships) and can be shown in any of the following formats, depending on the needs of the projects:

- Network diagrams
- Milestone chart
- Bar chart (also called Gantt Chart)

### **Control Schedule**

Schedule control means looking for things that are causing changes and influencing the sources of the change. If the project can no longer meet the agreed-upon completion date (the schedule baseline), the project manager might recommend the termination of the project before any more company time is wasted. Bar charts are weak planning tools, but they are effective for progress reporting and control. They are not project management plans. Bar charts do not help organize the project as effectively as a WBS and a network diagram do. They are completed after the WBS and the network diagram in the project management process.

### **5.4 Network Revision**

Network Revision as far as the steps involved in developing the initial network provided two basic pieces of information an estimate of the project duration and the critical path. The initial network constructed is examined to convert it into a valid, practical network which satisfies the project requirements and provides the basis for effective implementation and control. This process is called network revision. The purpose of revision is two-fold. Firstly, it is concerned with improving the quality of the information in the network; information about the relationships and durations of activities. Secondly, it is concerned with ensuring that the final network satisfied the project objectives. These relate to four factors; time, cost, resources and performance. Reviewing the relationships, the first task is to review the activities and their relationships. Some relationships may not have been shown properly in the initial network. A sequence of activities which at first sight appear to need serial representation, can sometimes be arranged to take place in parallel with one another. Often it is only a part of an activity which really conditions the start of the following activity, and in these cases, the activity can be subdivided and part of it depicted on the network as occurring in parallel with other activities. If the activity thus treated is on the critical path, a useful shortening of the project duration can be achieved. Reviewing the duration of activities, at the revision stage, the activity durations must be re-examined in the light of information about the project duration and critical path. Work may have to be analysed in greater detail, suppliers may have to be contacted for confirmation of current delivery periods and so on. Less accurate estimates can usually be tolerated for activities with plenty of float. For some activities, the duration is



variable. The time required to carry out the work depends almost entirely upon the quality or accuracy of performance specified. Estimates for research and development work and producing advertising copy or design work may be of this type. One approach for reviewing the duration of the activities when they are not critical is the use of the concept of available time. One useful little check, which can be applied to the activity durations, is to calculate the percentage of even number durations in the network. Because of a fairly general bias towards even numbers, the percentage is rarely as low as the theoretical 50%. Project objectives while in theory, the objectives of every project should be clearly defined at the outset, in practice this is not always done. On the other hand, the initial network assists and forces the clear definition of project objectives. Statement about objectives is usually expressed in terms of time, cost, resources and performance. It will be realized that the objectives stated in terms of one factor may conflict with others. For example, it may not be possible to complete a project in the shortest time and at minimum cost. If a network is to be checked to see whether it satisfies the project objectives, then these objectives must have been stated in such a way as to recognize and assign priority to their relationships. Meeting time objectives; It is likely that the project duration calculated from the initial network may not be acceptable to the management. This means that at the revision stage, the network must be modified to satisfy any time limits set for the project. If the project duration is to be reduced, the critical activities must be subjected first to careful examination. Changes in the relationships in turn affect the time along the concerned path as discussed earlier. But once the possibilities for changes in relationships have been exhausted, the scope for reduction in the duration of critical activities must be examined. In some cases, this may mean diverting resources from non-critical activities to critical, ones. In others, this may mean the use of more labour, more machines; overtime work or extra shifts. Meeting cost objectives: The cost of a project is usually given in terms of an estimate which may be required for such purposes as establishing feasibility, finding out return on investment, obtaining approval or getting out a price for a job, etc. The time involved will be important and a realistic cost target cannot be set without a careful study of the plan embodied in the network. The plan will determine in broad terms the pattern of expenditure over the period of the project. The network can be used to investigate this pattern of expenditure and the results can be compared with the availability of money. The network may indicate a pattern of expenditure in excess of what is possible, in which case the plan will have to be modified. Certain activities can be speeded up or slowed down depending upon the amount of money spent on them. The network can be used to examine the relationship between total time and total cost, and the project duration established for which the total cost is minimum. These aspects will be discussed in more detail later. Meeting resource objectives: The initial network is drawn without considering the resources as this does not

affect the relationships between activities. However, if the resources are limited, the plan must be examined to see to what extent it will have to be modified in the light of resource availability. Activities which are independent may have to be made dependent upon one another because they will be done by the same machine or by the same man. For example, a number of fitting jobs may be unrelated in the network, but if there is only one fitter to whom this work can be allocated then the jobs will have to be done one after the other. If the jobs have sufficient float to allow this, the project completion date will remain unaffected; but if the float is inadequate, an additional fitter has to be employed or a later completion date accepted. The plan should be modified accordingly. Another aspect which should be considered at this stage is the relationship between to duration of an activity and the resources allotted to it. The original duration assumes normal resources but for some activities, this time may be varied by altering resources put on the job. Thus certain critical activities may be speeded up by putting on additional resources, while activities with plenty of float may be allowed to take longer time with fewer resources, thus releasing men for more critical activities. Examination of the network can throw some light on the resource implications of the plan in a general way. Often a detailed analysis of the network is necessary, if the information is going to lead to management action. The analysis of network with respect to resources will be discussed in detail later. Meeting the performance objectives, there are two ways in which the plan influences the specification of the project. Firstly, it will embody methods of working and procedures which influence performance and these may have to be revised in order to effect a reduction in the project duration. It may be necessary to find alternative ways of doing things which are less satisfactory and the implications of these decisions must be carefully evaluated in relation to the project as a whole and the possible effect on the specification. The second aspect, already mentioned, is the relationship between performance and time for certain activities. Any reduction in the time allowed for development work and testing may affect ultimate performance and the plan must be checked to establish whether the original specification can still be met. In this way the network can give some indication of the relationship between time and performance, allowing the decisions to be made which are consistent with overall project objectives. The final network: There are usually a number of ways in which the plan can be revised to meet project objectives and each will have different implications. The use of network to simulate these alternatives can help in finding the right balance between the objectives. Many changes will be made to the initial network before a final plan can be agreed upon and on the basis of the final plan detailed work schedules are worked out.

## **Monitoring Development Projects and Project Evaluation**

### **5.5 Introduction**

M&E is a process of continual gathering of information and assessment of it in order to determine whether progress is being made towards pre-specified goals and objectives, and to highlight whether there are any unintended (positive or negative) effects from a project and its activities. It is an integral part of the project cycle and of good management practice. In broad terms, monitoring is carried out in order to track progress and performance as a basis for decision-making at various steps in the process of an initiative or project. Evaluation, on the other hand is a more generalised assessment of data or experience to establish to what extent the initiative has achieved its goals or objectives.

M&E is carried out for many different purposes. Monitoring systems provide managers and other stakeholders with regular information on progress relative to targets and outcomes. This enables managers to keep track of progress, identify any problems, and alter operations to take account of experience, and develop any budgetary requests and justify them. This enables the early identification of problems so that solutions can be proposed. It is considered to be a critical part of good management. Periodic evaluation is also considered to be good practice, and can be used to investigate and analyse why targets are or are not being achieved. It looks at the cause and effect of situations and trends which are recorded within monitoring.

Periodic and formal evaluation are vital for internal reporting and auditing, and are also requested by funding agencies – often as mid-term and final evaluations. External stakeholders and funding agencies that are accountable to donors or are part of the public sector need to see results and demonstrable impacts. However, it should be recognised that on-going or ‘informal’ evaluation should always be available as a tool to managers, not only to meet the requirements of governments and donors, but also as a means of understanding when and why things are going right or wrong during project implementation. M&E is also important for incorporating the views of stakeholders, particularly the target population and can be a further mechanism to encourage participation and increased ownership of a project. Thus, the key reasons for M&E can be summarised under four headings.

1. For accountability: demonstrating to donors, taxpayers, beneficiaries and implementing partners that expenditure, actions and results are as agreed or can reasonably be expected in the situation.
2. For operational management: provision of the information needed to co-ordinate the human, financial and physical resources committed to the project or programme, and to improve performance.

3. For strategic management: provision of information to inform setting and adjustment of objectives and strategies.
4. For capacity building: building the capacity, self-reliance and confidence of beneficiaries and implementing staff and partners to effectively initiate and implement development initiatives. Monitoring and evaluation should be evident throughout the lifecycle of a project, as well as after completion. It provides a flow of information for internal use by managers, and for external use by stakeholders who expect to see results, want to see demonstrable impacts, and require accountability and trustworthiness on the part of the public sector.

Governments and organisations are accountable to stakeholders and this requires them to both achieve expected outcomes and be able to provide evidence that demonstrates this success. As a consequence increasing attention is now being given to funding rigorous impact evaluations that are capable of providing solid empirical evidence about whether or not a particular type of development intervention works. Producing this evidence is technically challenging and expensive and won't be feasible for all or even the majority of projects. Nevertheless, as a vehicle of policy research it can, when applied to particular kinds of project, help inform decisions about how to allocate resources between different types of intervention, and between different project designs. The demand for rigorous impact evaluation clearly has implications for the design of M&E systems, and is most likely to be met if the project and associated M&E system are designed with this rigour in mind from the outset.

Monitoring and evaluation of projects can be a powerful means to measure their performance, track progress towards achieving desired goals, and demonstrate that systems are in place that support organisations in learning from experience and adaptive management. Used carefully at all stages of a project cycle, monitoring and evaluation can help to strengthen project design and implementation and stimulate partnerships with project stakeholders. At a sector level monitoring and evaluation can:

- improve project and programme design through the feedback provided from midterm, terminal and ex post evaluations.
- inform and influence sector and country assistance strategy through analysis of the outcomes and impact of interventions, and the strengths and weaknesses of their implementation, enabling governments and organisations to develop a knowledge base of the types of interventions that are successful (ie what works, what does not and why)

- provide the evidential basis for building consensus between stakeholders At project level monitoring and evaluation can:
- provide regular feedback on project performance and show any need for ‘midcourse’ corrections
- identify problems early and propose solutions
- monitor access to project services and outcomes by the target population;
- evaluate achievement of project objectives
- measure the impact of the project on various indicators (including those relating to project objectives and other areas of concern)
- incorporate stakeholder views and promote participation, ownership and accountability

## **5.6 Definitions of Monitoring and Evaluation**

**Monitoring** is the continuous collection of data on specified indicators to assess for a development intervention (project, programme or policy) its implementation in relation to activity schedules and expenditure of allocated funds, and its progress and achievements in relation to its objectives.

**Evaluation** is the periodic assessment of the design, implementation, outcomes and impact of a development intervention. It should assess the relevance and achievement of objectives, implementation performance in terms of effectiveness and efficiency, and the nature, distribution and sustainability of impacts.

It is clear that monitoring and evaluation are different yet complementary. Monitoring is the process of routinely gathering information with which to make informed decisions for project management. Monitoring provides project managers with the information needed to assess the current project situation and assess where it is relative to specified targets and objectives – identifying project trends and patterns, keeping project activities on schedule, and measuring progress toward expected outcomes. Monitoring can be carried out at the project, programme or policy levels. Monitoring provides managers and other stakeholders with regular information on progress relative to targets and outcomes. It is descriptive and should identify actual or potential successes and problems as early as possible to inform management decisions. A reliable flow of relevant information during implementation enables managers to keep track of progress, to adjust operations to take account of experience and to formulate budgetary requests and justify any needed increase in expenditure. Indeed, an effective management information system that performs these functions is an essential part of good management practice. Evaluation, on the other hand, gives information about why the

project is or is not achieving its targets and objectives. Some evaluations are carried out to determine whether a project has met (or is meeting) its goals. Others examine whether or not the project hypothesis was valid, and whether or not it addressed priority needs of the target population. Depending on the purpose of a particular evaluation, it might assess other areas such as achievement of intended goals, cost-efficiency, effectiveness, impact and / or sustainability. Evaluations address: 'why' questions, that is, what caused the changes being monitored; 'how' questions, or what was the sequence or process that led to successful (or unsuccessful) outcomes; and 'compliance and accountability' questions, that is, did the promised activities actually take place and as planned? Evaluations are more analytical than monitoring, and seek to address issues of causality. A baseline study is the first phase of a project evaluation. It is used to measure the 'starting or reference points' of indicators of effect and impact. Frequent evaluation of progress is good management practice. It seeks to establish causality for the situations and trends recorded by monitoring. Clearly evaluation should respond when monitoring identifies either problems or opportunities to enhance achievements. Managers should use evaluation results to make adjustments to the design and implementation of their project or other interventions. Periodically this can be formalised to involve the recipient government and donor in one or more formal reviews such as a mid-term evaluation. Terminal evaluations are similarly formalised and typically conducted at the end of the intervention to provide the information for completion reports. An ex post evaluation may be completed a further period after completion, when it is reasonable to expect the full impacts of the intervention to have taken place. On-going, 'process' or informal evaluation occurs during the course of the project as part of good management practice to assess activities or functions and to make recommendations for improving project implementation. Summative evaluations are carried out at the end of a funding period to assess positive and negative impacts and examine the effectiveness of a project. These are often termed 'impact assessments'. Lessons learned from final evaluations should contribute to the formation of future projects and programs. Such formalised and periodic evaluations are important for the internal reporting and auditing procedures of the organisations involved, and as a means to document experience and feed back into the planning of future interventions. It should be recognised, however, that evaluation is always available as a mode of analysis that can help managers and other stakeholders to understand all aspects of the work at hand. This applies from design stages, through implementation and on to completion and final outcomes. The terms 'informal' or 'ongoing' evaluation can be used to describe evaluation that is conducted primarily by managers themselves as a key part of effective management and project implementation. Project level M&E systems should overlap with and feed into public sector management information systems. These generally place emphasis on the use of information

streams that are more or less continuous, and which can be trusted and used in real time for decision-making. When monitoring and evaluation is effective knowledge should accumulate in the experience and expertise of staff, in the documented institutional memory of the organisation and its partners, and in their planning and management procedures.

### **5.7 Design and Implementation of M&E Systems**

This section explains what can go wrong with project M&E systems and sets out a framework of concepts and principles that can aid the design and implementation of effective project M&E. It provides the core of a guidance manual or handbook for professional work in this field.

**Section Learning Outcomes** By the end of this section, students should be able to:

- Understand the M&E systems and their relation to the logical framework analysis.
- Be familiar with the challenges of M&E and the concepts of results-based management.

The six main components of a project M&E system

1. Clear statements of measurable objectives for the project and its components.
2. A structured set of indicators covering: inputs, process, outputs, outcomes, impact, and exogenous factors.
3. Data collection mechanisms capable of monitoring progress over time, including baselines and a means to compare progress and achievements against targets.
4. Where applicable building on baselines and data collection with an evaluation framework and methodology capable of establishing causation (ie capable of attributing observed change to given interventions or other factors).
5. Clear mechanisms for reporting and use of M&E results in decision-making.
6. Sustainable organisational arrangements for data collection, management, analysis, and reporting.

### **5.8 M&E Systems and Common Deficiencies**

A monitoring and evaluation system is made up of the set of interlinked activities that must be undertaken in a co-ordinated way to plan for M&E, to collect and analyse data, to report information, and to support decision-making and the implementation of improvements. ?

The design of an M&E system should start at the same time as the overall project preparation and design, and be subject to the same economic and financial appraisal, at least to achieve the least-cost means of securing the desired objectives. Such practice has been followed for projects in recent

years. Problems arose with earlier M&E systems that were set up after the project had started. Often this was left to management alone, who by that time already had too much to grapple with and could not provide sufficient time, resources or commitment. The 'supply side' of M&E design should not be overlooked. Skilled and well-trained people are required for good quality data collection and analysis. They may be a very scarce resource in developing countries, and should be 'shadow-priced' accordingly when appraising alternative M&E approaches. It is inevitable that the system designed will not be as comprehensive as is desirable, and will not be able to measure and record all the relevant indicators. It is here that the project analyst must use the tools of economic appraisal, and judgment based on experience, to find the best compromise. Evaluations of existing M&E systems by agencies have shown certain common characteristics, weaknesses, and recurrent problems which are important causes of divergence between the theory of M&E and actual practice in the field. These are worth bringing to the attention of both designers and operators of M&E systems, as problems to be avoided in the future:

- poor system design in terms of collecting more data than are needed or can be processed
- inadequate staffing of M&E both in terms of quantity and quality
- missing or delayed baseline studies. Strictly these should be done before the start of project implementation, if they are to facilitate with and without project comparisons and evaluation
- delays in processing data, often as a result of inadequate processing facilities and staff shortages. Personal computers can process data easily and quickly but to make the most of these capabilities requires the correct software and capable staff
- delays in analysis and presentation of results. These are caused by shortages of senior staff, and by faulty survey designs that produce data that cannot be used. It is disillusioning and yet common for reports to be produced months or years after surveys are carried out when the data have become obsolete and irrelevant. This is even more the case when computer printouts or manual tabulations of results lie in offices, and are never analysed and written up
- finally, even where monitoring is effective the results often remain unused by project staff.

The basic deficiencies that lead to such problems are now widely recognised, though that does not ensure that the same mistakes are not still made. M&E systems impose a high additional recurrent cost on project implementation, while the benefits are neither quantifiable in terms of increased production, nor may even be readily apparent in the short term. It is imperative that such errors and failures are avoided if governments and international institutions are not to lose faith in M&E as an



aid to successful project implementation. Even with a good design for M&E, experience shows that success during implementation depends heavily on a sense of ownership by the government, adequate capacity in public sector institutions, and sustained interest from the project managers throughout the life of the project. Two factors are important here. One is that a sense of ownership of the project provides a stimulus to transparent management and good information about progress. The other is that often countries may doubt the value of adopting what may be costly and time-consuming procedures to collect, analyse, and report information. In such circumstances sound design is especially important. Monitoring information needs to provide a clear input into management decision-making. It is also helpful if early gains can be demonstrated from monitoring and if institutional procedures can be developed that encourage the use of monitoring data to trigger and support implementation decisions from the start.

### **5.9 Key Design Principles for Project Monitoring and Evaluation**

Project M&E design can be guided by the concept of project logic and logical framework analysis. Implicitly or explicitly a good project design will be based on a clear and logical project strategy. This is usually made explicit in the form of a logical hierarchy of relationships between the various project elements; progress at each level being a precondition for achievement at the next higher level. In other words, achievement at one level provides the means for achievement at the next higher level, based on tried and tested processes and established technical relationships, but subject to identified key assumptions and risks. It is necessary to establish these in order to be able to design a sound M&E system. Note that a complex project may have more than one objective, and it may be necessary to define the strategy or causal chain of each project component. The logical framework analyses of different project components can then be ‘nested’ or linked together. This recognises that the objective and ultimately the impact of one sub-project or project component can be an outcome for the main project or overall programme. Note that any project strategy cast as a logical hierarchy simplifies reality and cannot account for all details of the intended plan and its context. Thus the documented strategy is a management tool that needs continual review and adjustment to reflect current contexts and changing needs. The ability to adjust the strategy depends on clarity about what project management is capable of influencing and achieving, and on having the information necessary. Monitoring and evaluation provides the key to the latter.

#### **A Logical Structure for Project Monitoring and Evaluation**

Goal	Impact	Results monitoring	long-term improvement in society	widespread
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Purpose	Outcome		intermediate effects for beneficiaries
Outputs	Output	Implementation monitoring	capital goods, products and services produced
Activities	Process		tasks undertaken to transform inputs to outputs
Inputs	Inputs		human and material resources

The extent to which the project contributes to its development goal(s) is the impact of the project (there may also be unintended impacts, both positive and negative). The achievement of project purpose is measured in terms of results, which are the extent to which the observable outcomes are as planned. Monitoring at these two levels is usefully referred to as ‘results monitoring’. Lastly the operation and performance of the project can be assessed in terms of the effectiveness and efficiency of the processes through which inputs are utilised to produce the planned outputs. This can be usefully referred to as ‘implementation monitoring’. Thus, there are clear relationships between the levels of a project’s logical hierarchy, the types of indicators needed, and the focus for monitoring and evaluation. There should also be a clear relationship between implementation monitoring, the day-to-day implementation of the project in terms of procurement and all activities, and the financial management of the project. Thus, a reconciliation should ultimately be possible between financial disbursement and expenditure, records of physical activities and processes, and the key indicators used for implementation monitoring. Communicating the project strategy to all project implementing partners and stakeholders through the use of clear and logical statements is essential. Even if logical framework analysis and its terminology is not fully used, there should be clear understanding and a consensus about the objectives to be achieved, what will be implemented and over what timescale. Without this it is difficult to know what should be monitored, and how the performance of a project and the changes it brings can be evaluated. Moving from monitoring to evaluation defines core criteria commonly used in the evaluation of development projects, and of sector and policy level interventions.

### 5.10 Evaluation Criteria

1. **Impact:** The effect of the project on its wider environment, and its contribution to the wider policy, sector, PRSP or Country Assistance Strategy development objectives.
2. **Relevance:** The appropriateness of project objectives to the problems intended to be addressed, and to the physical and policy environment within which the project operates.

3. **Effectiveness:** How well the outputs contributed to the achievement of project purpose and the overall goal(s), and how well assumed external conditions contributed to project achievements.
4. **Efficiency:** Whether project outputs have been achieved at reasonable cost, ie how well inputs have been used in activities and converted into outputs.
5. **Sustainability:** The likelihood that benefits produced by the project continue to flow after external funding has ended.

### **5.11 The Limits of Project Management**

The ability of managers to use the information produced by monitoring and evaluation to adjust a project's strategy during implementation will depend on the flexibility of the project's design and management arrangements. If a project is 'process-oriented' and designed with an open-ended strategy, then general directions will be indicated but with freedom for project partners to refine the operation of the project as it proceeds. The more flexible the situation, the more a good monitoring and evaluation system is necessary to provide managers with the information needed to be responsive and adaptive, and the more the M&E system itself will need to evolve over time as implementation proceeds. If a project is 'blue-print' oriented and more rigidly designed, the opportunities to adjust the strategy may be restricted to periodic opportunities such as mid-term reviews. For such projects M&E findings will be critical in informing and providing the justification for change, when change is needed. The design of the M&E system from the commencement of the project will in turn be more 'blue-print' oriented, although this should not completely rule out flexibility and the possibility of change. In response to information gained from M&E project management can be expected to adjust those elements of a project that are within its control, but control over the factors that influence the achievement of objectives diminishes with each higher level of the hierarchy. It is reasonable to hold project management accountable for achievement up to the level of the project purpose and thus monitoring and evaluation by management at this level is crucial. This is particularly true during the early stages of a project when change is easiest. For higher level goals to be achieved there may be necessary external conditions that are beyond the direct control of project management. A range of factors may influence the impacts that occur, and managers may be only one of several stakeholder groups and agencies that contribute to achievements. Thus at higher levels in the hierarchy a project's accountability diminishes, although it does not disappear entirely. When monitoring and evaluation reports achievement of the project purpose but failure to contribute to higher development goals as expected, it means that either the project design is faulty, or that the supporting external conditions were not as assumed. In both

cases, response is needed from all project partners, led by the supervising governmental agency and funding organisation, and informed by the lessons from monitoring and evaluation. In some cases, the response necessary to improve impact may be at a sectoral rather than project level.

### **5.12 The Challenges of Outcome and Impact Monitoring and Evaluation**

Given that ‘inputs’, ‘activities’ and ‘outputs’ are within the direct control of project management, ‘implementation monitoring’ and evaluation is a core management function, and achievable largely through internal record-keeping and analysis. Indicators of inputs, process and outputs are usually generated by project management, and/or by government and funding agency accounting and reporting requirements. Attention to detail and good data management systems are important, but conceptually and methodologically this should be straightforward and a standard aspect of good management practice. Difficulty increases at the levels of ‘outcomes’ and ‘objectives’. These are the subject of ‘results monitoring’. For ‘results monitoring’ indicators are subject to the twin problems of measurement and attribution. First, for an indicator to be useful it is necessary to be able to measure whether change has occurred over time compared to a ‘baseline’. This is problematic for indicators which are subject to considerable annual or seasonal variability, and thus require a long time series of values for a trend to be determined with statistical validity. Crop yields are a typical example, and one highly relevant as an outcome indicator for many rural development projects. At least five or more years’ data will typically be needed to show that yields have improved, and this requirement may be even greater in regions subject to highly variable rainfall. In agriculture such variability in production, compounded by the typical co-variance between producers in a given location, can feed through into volatility in other key ‘outcome’ and ‘impact’ indicators such as food prices, rural employment and rural household incomes. This measurement problem can be compounded by practical problems that are typically most severe in resource poor and remote regions. Recording of crop yields, for example, will require a survey that takes either physical samples or relies on farmer estimates. Both approaches will be subject to sampling and other errors that can only be reduced through intensive training and supervision of enumerators; activities that are costly and time consuming. Data series may already exist for some typical outcome and impact indicators and subject to an assessment of their quality should be used in preference to new data collection. However, where there are gaps, M&E survey designers need to pay particular attention to comparability with the existing data when selecting survey instruments and methods. Even under conditions of close supervision and rigorous design, small changes in the way in which questions are put, the layout of the survey form, and guidance given to enumerators can undermine comparability. This is particularly likely to apply to indicators of household

consumption and income, and other measures of poverty. Assuming such measurement problems can be solved, and change over time can be observed with statistical validity for an indicator of outcomes or impact, the second of the twin problems is that of attribution. Establishing that the cause of the observed trend is the project and not one or more external factors requires a rigorous evaluation framework. A range of formal approaches are available, all essentially requiring the observed change to be tested against a reliable counterfactual (the situation that would have happened had the project not taken place). Whilst not insoluble, this problem is often challenging for agricultural and other rural development projects, and again will require considerable time, resources and expertise. The best practical guidance manuals for project M&E have emphasised the effective use of leading indicators, as described below, as a priority before resources are devoted to ambitious and formal evaluation approaches. It is also worth noting that attribution of outcomes and impacts will be easier in some sectors than others and usually easier at a project level than a programme or policy level. Generally, attribution is easier within sectors that deal primarily with nonhuman/non-social environments within which interventions can be isolated and measured, and more difficult in complex human and social environments in which linear logical models and hypothesis testing methodologies may be inapplicable. Simple project level interventions with explicit, measurable objectives, carried out in a short time frame will also be more amenable to impact evaluation than programme level interventions or policy reforms which involve sets of interventions aimed to achieve complementary sets of changes across a region, sector or country. Inferring causation at this level of analysis is extremely difficult, if not impossible. These methodological issues are returned to elsewhere in this unit. The key points to note here are that the monitoring and evaluation of outcome and impact indicators will require considerable time and resources. This particularly applies when 'formal' methods that can produce results with statistical validity are to be used, but it also applies to the use of more qualitative methods and to a focus on processes as well as outcomes and impacts. Thus adequate human resources and expertise are essential for what is, for all practical purposes, an exercise in applied inter-disciplinary research. These methodological challenges and requirements for staff with applied research skills may be beyond the capacity of the project management organisation, and if so, the services of national agencies and/or external specialists (consultants) will be required.

### **5.13 Results-Based Monitoring and Evaluation**

Governments and international development agencies are increasingly being called upon to demonstrate results. Besides demands for greater accountability and transparency, stakeholders are also demanding greater efficiency and effectiveness of development actions. As a result, a number

of development agencies are promoting a results management framework as a strategic approach to be applied in all aspects of the project cycle. Results-based monitoring and evaluation places particular emphasis on outcomes and impact. It emphasises that it is not sufficient simply to determine that planned outputs have been delivered on time and on budget. The ‘ends’ are more important than the ‘means’ and it is necessary to determine, and show evidence that, planned outcomes and a worthwhile contribution to national goals are being achieved. A results-based management approach should enhance public sector performance generally, and is particularly applicable for programme and policy interventions at sector level which adopt a flexible approach to implementation, and for which ‘inputs’, ‘activities’ and ‘outputs’ may not be fully specified in advance.

However, at project level it would be harmful if the focus on outcomes and impacts led to the neglect of core management information systems that cover the project inputs, processes and outputs which good outcomes ultimately depend on. Similarly, the role of leading indicators of outcomes and impact for use by project managers should not be neglected. Results-based management for projects needs to build upon monitoring and evaluation systems that are initially focused on the implementation and performance of projects, but which can progress to evaluation of outcomes and impact as implementation proceeds. Where the costs of overcoming the methodological and practical challenges of outcome and impact evaluation are prohibitive, or when human resources are inadequate, full and rigorous impact evaluation may need to be applied selectively to those projects that are most significant because of their scale or innovation, or because they are representative of other similar interventions. A results-based approach is particularly important if a project is ‘process-oriented’ and designed with an open-ended strategy, general directions being indicated but detailed work plans and resource provision not specified in advance. This may also apply to many sector level interventions. Clearly, it may not be possible to initially develop a full logical framework analysis of inputs, activities and outputs for the purposes of planning, although if useful this can be developed as a management tool during implementation for project or programme components, once these are agreed by project partners and take shape ‘on the ground’. For all projects, a focus on results-based management also puts pressure on the project manager and other members of the task team to change or adapt the project if it is not demonstrating that it can achieve the desired outcomes; looking ahead at achievements, rather than inwardly and narrowly at processes. These observations apply to many rural development projects, especially those involving substantial investments in community-level organisations and institutions, and supporting human resource and other management systems. These are complex projects to implement and require flexible and adaptive implementation and operation if they are to achieve

their optimal performance, outcomes and impact. The selection of indicators for results-based M&E needs to be based on the logic of the project design (as outlined above) and the generation of management information must be linked to the phasing of the project. Having the right information at the right time, in the right place and in the right form is the key to successful responsive and adaptive management, and to informed and supportive project partners and wider stakeholders. Monitoring progress towards higher level development objectives requires that information be derived from all levels in the logic model of the project, at different time frames, and for different stakeholder needs. This is a management function and project managers must take responsibility for knowing how well the project is being implemented and whether leading indicators suggest that continued implementation will generate the expected outcomes and impact or whether corrective action is needed. Managers should also ensure that reliable evidence of impact can ultimately be produced to demonstrate accountability and to feedback into the planning of further interventions. Supervising organisations must similarly make effective use of the information generated to facilitate flexibility in project management, allowing timely corrective adjustments to be made to implementation, and continually seek to improve the development effectiveness of programme and policy-level interventions. This will require mechanisms to be institutionalised that feedback the lessons from monitoring and evaluation into planning and supervision processes.

#### **5.14 Planning and Implementing a Project Monitoring and Evaluation System**

Steps in planning a project M&E system

- (1) Assess the existing readiness and capacity for monitoring and evaluation
- (2) Establish the purpose and scope of M&E
- (3) Identify and agree with stakeholders the project's outcomes and development goal(s)
- (4) Select key indicators and an evaluation framework
- (5) Set baselines and plan data collection and analysis
- (6) Select results targets
- (7) Plan monitoring, data analysis, communication and reporting
- (8) Plan the form and timing of critical reflection and interim evaluations
- (9) Plan for the necessary conditions and capacities

Key points for each of these nine steps are outlined below.

## **1. Assess the Existing Readiness and Capacity for Monitoring and Evaluation**

- Review current capacity within the organisation and its partners which will be responsible for project implementation, covering: technical skills, managerial skills, existence and quality of data systems, available technology and existing budgetary provision.
- Identify any barriers to M&E of the project such as a lack of political will, expertise or experience.
- What other organisations such as universities, private consultants or government agencies have the capacity to provide technical assistance and/or training?

## **2. Establish the Purpose and Scope**

- Why is M&E needed and how comprehensive should the system be?
- What are national requirements with regard to M&E?
- In particular, what should be the scope and degree of rigour of the evaluation of final project impact?
- Should the M&E process be participatory? In planning and implementing project M&E it is important to recognise the potential benefits of stakeholder participation. There can be benefits from this at all stage of the project cycle including monitoring and evaluation.

## **3. Identify and Agree with Main Stakeholders the Project's Outcomes and Development Objective(S)**

- Setting a development goal and the project purpose or expected outcomes is essential in building a M&E system. In project design the specification of outputs, activities and inputs follows from this, and the expectation that achievement of outcomes will contribute to the higher level development goal(s) provides the justification for the project.
- In M&E design, indicators, baselines and targets, are similarly derived from the setting of goals and outcomes.

## **4. Select Key Indicators and Evaluation Framework**

- Indicators are the qualitative or quantitative variables that measure project performance and achievements.
- Indicators should be developed for all levels of project logic, i.e. indicators are needed to monitor progress with respect to inputs, activities, outputs, outcomes and impact, to feedback on areas of success and where improvement is required.

### **Criteria for Selection of Indicators**

<b>Criteria</b>	<b>Description</b>
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Relevant	Indicators must be representative of the most important aspects of implementation and of the outcomes and impacts intended.
Clear	Indicators must be unambiguous and clearly defined in the project's context, and in a manner understood and agreed by all stakeholders. Any adjectives used to describe the qualities of an indicator need to be precisely defined. For example: – what is meant by 'improved service delivery?' – an indicator may be 'the area of degraded land' but what criteria will be used to classify such land? – for households what is included in 'farm income' and what in 'non-farm income?'
Specific	Indicators should measure specific changes, and be specific to a timeframe, location and target or other stakeholder group.
Measurable	There must be practical ways to measure the indicator, either in quantitative or qualitative terms that are within the capability of the monitoring organisation. It must be possible to collect, process and analyse data in time and within budget
Consistent	The values of the indicators should be reliable and comparable over time when collected using the same methods. This is more likely when indicators are measured in a standardised way and with sound sampling procedures.
Sensitive	Indicators should be sensitive to the expected changes. It is especially important that leading indicators are capable of revealing short-term movements. Indicators that require a long time series of values are practically useless for implementation decisions.
Attributable	Based on an established or probable relationship expected to cause the intended change. In moving from inputs and outputs to outcomes and impacts attribution must typically rely less on direct observation of cause and effect and more on statistical evidence of change and its probable cause.

The evaluation framework sets out the methods to be used to address the question of whether change observed through monitoring indicators can be attributed to the project interventions. The depth and rigour of impact evaluation required for a specific project given available resources needs to be carefully considered. A range of approaches are possible, but all require careful planning in conjunction with the selection of indicators if data omissions and weaknesses are to be avoided, and valid and reliable results produced. Assuming use of an experimental or quasi-experimental

evaluation design, determination of which population units will receive the intervention and which will not, and establishing baseline information for all units are two reasons for detailed planning of impact evaluation in advance.

#### **5. Set Baselines and Plan Data Collection and Analysis**

- The baseline is the first measurement of an indicator, which sets the preproject condition against which change can be tracked and evaluated. A single point in time or current value may not be representative and it may be better to use an average, for example, for the three previous years if such data are available. Baseline data must be gathered for the key indicators and this may require implementation of a baseline survey unless existing data sources are adequate.
- Subsequent data gathering and repeat surveys for the implementation period of the project and beyond should then be planned. Data collection may be continuous or periodic depending on the nature and purpose of an indicator. A wide range of data collection methods are applicable. The analytical approaches that will be required to match the needs of managers for information and of the evaluation framework must also be considered. In projects concerned with land use changes, use of modern technologies such as remote sensing should be considered.
- Ideally there should be sufficient capacity and resources to allow ad hoc special studies or investigations to be carried out to address specific problems or issues revealed by the ongoing evaluation of monitoring data. These will be one-off, focused investigations of the issue at hand.

#### **6. Select Results Targets**

- Following definition of outcomes, indicators and baselines, target setting is a key step in building a results-based approach. A target is a specification of the quantity, quality, timing and location to be realised for a key indicator by a given date. Starting from the baseline level for an indicator the desired improvement is defined taking account of planned resource provision and activities, to arrive at a performance target for that indicator. Most targets are set annually, but some could be set quarterly or for longer periods. Targets do not have to be single numerical values and sometimes a range of achievement may be more appropriate. Targets should also be kept under review and revised flexibly as necessary to take account of changing resource availability or other factors beyond the control of project management, but not to disguise poor project performance.

- It is important to be realistic, taking account of what is feasible and being sensitive to the political issues associated with targets that are publicly announced. As outcomes are typically longer term it is usually necessary to establish targets as short-term objectives on the path to achievement of an outcome. For project management, targets for ‘leading indicators’ are particularly useful. Interim targets over shorter time periods for which inputs can be better known or estimated, and set with reference to desired outcomes and impact, are also important for process-orientated interventions for which work plans and resource provision are not fully planned in detail in advance.

#### **7. Plan monitoring, data analysis, communication, and reporting**

- ‘Implementation monitoring’ tracking the inputs, activities and outputs in annual or multiyear work plans, and ‘results monitoring’ tracking achievement of outcomes and impact, are both needed. The demands for information at each level of management need to be established, responsibilities allocated, and plans made for:
  - what data to be collected and when;
  - how data are collected and analysed;
  - who collects and analyses data;
  - Who reports information, and in what form, to whom and when?
- An assessment of the flow of information and degree of detail needed by each level of management will help to clarify the indicators to be measured. The agency managing the project will require different types of information for its own internal management, compared to the reporting requirements of higher levels of government and development agencies.

#### **8. Plan the Form and Timing of Critical Reflection and Interim Evaluations**

- For managers evaluation should be a continuously available mode of analysis utilised whenever evaluation results can be useful. Scheduling of events such as management team meetings can, however, be useful to ensure that analysis of progress and critical reflection takes place. Similarly, periodic project review workshops to facilitate analysis and discussion with project partners and other stakeholders may be necessary. Supervision requirements of governments and funding agencies may require periodic and formalised evaluations to take place. The data needs and analysis requirements for mid-term, terminal and ex post evaluations should be considered, and planning for these linked to the planning of monitoring and choice of evaluation framework. A timetable of formal evaluation reports should be set out.

- An indication also needs to be given at the design stage about feedback mechanisms for evaluation results beyond donor formalities such as mid-term and completion reviews. This is linked both to the development of accountability within the project, sector and higher levels of government, and the need to provide information to support decision-making. For example, flows of information may need to be timed to fit into national budget planning activities, and should inform and influence identification and appraisal of any similar future projects or programmes.

#### **9. Plan for the necessary conditions and capacities.**

- It is necessary to plan the organisational structure for M&E including whether a M&E unit specific to the project is needed. Appropriate organisational structures for M&E should be discussed with partners and other stakeholders. Each partner's responsibilities and information requirements should be considered. Planning should cover: staffing levels and types, responsibilities and internal linkages, incentives and training needs, relationships with partners and stakeholders, horizontal and vertical lines of communication and authority, physical resource needs and budget.
- Monitoring and on-going evaluation should normally be the responsibility of the project managers. Impact evaluation may often require the expertise and capacity of external specialists.

#### **Questions:**

1. List out the steps to be followed by project manager to plan and schedule networking of the project?
2. What do you mean by programme management? How network revision can be done?
3. List ten complementary roles that monitoring and evaluation can play – five for monitoring and five for evaluation?
4. From what you have learnt from the unit, what are the key 'tips' that you would share with somebody just drawing up a plan for project monitoring and evaluation?
5. What are the components of a project M&E system?
6. Write down the steps in planning a project M&E system?

#### **Suggested Readings**

- Katar Singh (2009), Rural Development: Principles, Policies and Management, SAGE Publications India Pvt. Ltd. Publication year: 2009.
- H. D. Foth & I. M. Turk, Fundamentals of Soil Science, Wiley Eastern.
- Bneerjee G. D, Srijeet (2012), Rural Entrepreneurship Development Programme in India, An Impact Assessment, Abhijeet publication
- Kapil Bhargav, (1 January 2010), Co-operation Management and Rural Development, Axis Publications
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**CERTIFICATE COURSE IN RURAL MANAGEMENT**

## **COURSE: RURAL MANAGEMENT**

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### **UNIT 6: NATURAL RESOURCES MANAGEMENT: DROUGHT-PRONE AREAS PROGRAMME, DESERT DEVELOPMENT PROGRAMME (DDP), INTEGRATED WASTELAND DEVELOPMENT PROGRAMME (IWDP), SOCIAL FORESTRY AND JOINT FOREST MANAGEMENT**

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#### **STRUCTURE**

**6.0 Objectives**

**6.1 Introduction to Natural Resource Management**

**6.2 Objectives of Natural Resource Management**

**6.3 Approaches to Management of Natural Resources**

**6.4 Introduction to Drought Prone Areas Programme**

**6.5 Objectives**

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**6.8 Physical Performance**

**6.9 Components of the strategy**

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**6.11 Basic Objectives of a Command Areas Programme**

**6.12 The main components of the CAD strategy**

**6.13 Introduction (Desert Development Programme)**

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**6.15 Coverage**

**6.16 Cost Norms & Funding Pattern**

**6.17 Physical Performance of the DDP**

**6.18 Area Treated**

**6.19 Financial Performance**

**6.20 The following are desert areas in India**

**6.21 Introduction (Integrated Wasteland Development Programme)**

**6.22 Historical Background/Evolution of the Programme**

**6.23 Objectives of IWDP**

**6.24 Programme Guidelines and Guiding Principles**

**6.25 Salient Features of the Guidelines**

**6.26 What is a watershed?**

**6.27 Components of Watershed Development**

**6.28 Salient Features of the Programme**

**6.29 Major Activities of a Watershed Project**

**6.30 Institutional Framework for Implementation**

**6.31 Monitoring the Performance**

**6.32 Conclusion**

**6.33 Introduction (Social Forestry and Joint Forest Management)**

**6.34 Social Forestry: Perspective**

**6.35 Types of Social Forestry in India**

**6.35.1 Farm Forestry**

**6.35.2 Agro-Forestry**

**6.35.3 Extension Forestry**

**6.35.4 Community Forestry**

**6.35.5 Silviculture or Scientific Forestry**

**6.36 Assessment of Social Forestry Programmes**

**6.37 Joint Forest Management: Concept and Objectives**

**6.38 Design of the Programme**

**6.39 The Impact of Joint Forest Management**

**6.40 Participation of Communities in Conservation of Biodiversity Village Eco- development**

**6.41 Village Eco-development as a Government Programme**

**6.42 Conclusion**

**Questions**

**Suggested Readings**



## **6.0 Objectives**

1. To minimize the adverse effects of drought on the production of crops and livestock and productivity of land,
2. To promote overall economic development and improving the socio-economic condition of the resource poor and disadvantaged sections.
3. It emphasised on irrigation projects, land development programmes, afforestation, grassland development and creation of basic rural infrastructure such as electricity, roads, market, credit and services. Water and human resources thereby ultimately leading to the drought proofing of the affected areas.
4. Direct participation of the people in planning and development of watershed areas and maintenance of assets.
5. Panchayati Raj Institutions have the right to monitor and review the programme at district, block and village levels.
6. Particularly in motivating people, community organisation and training.

## **Natural Resources Management-Drought Prone Areas Programme (DPAP)**

### **6.1 Introduction to Natural Resource Management**

**Natural resource management (NRM)** is the management of natural resources such as land, water, soil, plants and animals, with a particular focus on how management affects the quality of life for both present and future generations (stewardship).

Natural resource management deals with managing the way in which people and natural landscapes interact. It brings together natural heritage management, land use planning, water management, bio-diversity conservation, and the future sustainability of industries like agriculture, mining, tourism, fisheries and forestry. It recognises that people and their livelihoods rely on the health and productivity of our landscapes, and their actions as stewards of the land play a critical role in maintaining this health and productivity.

Natural resource management specifically focuses on a scientific and technical understanding of resources and ecology and the life-supporting capacity of those resources. Environmental

management is similar to natural resource management. In academic contexts, the sociology of natural resources is closely related to, but distinct from, natural resource management.

Natural resource management refers to strategies intended to sustain both renewable and non-renewable resources for present and future use. By considering how best to use the particular resource, its productivity is prolonged, and its relationship with the environment is protected.

One example of natural resource management could include the efforts of a number of organizations to preserve water availability and quality around the world. Management of water is becoming especially important as regions of the globe become warmer and drier under the influence of global warming. Natural resources that are especially vulnerable to exploitation include forests, fisheries, and the agricultural capability of land

## **6.2 Objectives of Natural Resource Management**

The objectives of natural resource management are as follows:

- To maintain ecological diversity.
- To provide resources for future generations.
- To maintain employment facilities for people.

## **6.3 Approaches to Management of Natural Resources**

Now that we know how important natural resources are, what steps are we taking in the direction of saving ourselves from the crisis of natural resources? Are there any measures being taken at all? Let's find out in the upcoming segment.

Natural resources need to be used in a sustainable manner for the welfare of mankind. They are so complex in nature that coming up with fresh frames as solutions seem to be the only way out.

- Various rules and regulations have been passed by the Government over the years to ensure that our wildlife does not become extinct and are not hunted down. The government has also passed rules and laws to limit large scale industries from the use of excess water and rules for proper sewage to ensure water bodies around industrial areas are not getting contaminated. Care has also been taken by the government with regard to air pollutants being released by industries in the air causing harmful diseases
- Water is being treated regularly to provide drinkable water to the people

- The government has adopted measures and encouraged people to recycle and reuse products as much as possible.
- Use of plastic has also been banned which reduces damage caused to nature to quite a large extent
- Clean India Mission or Swachh Bharat Abhiyan was launched by PM Narendra Modi. It was initiated with the aim of having cleaner streets, society, and environment, contributing to the national and hence global welfare.

Management of natural resources focuses on preventing over-exploitation of resources. e.g., with the advancement of agriculture practices and farming have shifted from manual labour to the use of machines. The increasing use of pesticides has become damaging to the environment. All this has increased the need for natural resource management wisely.

#### **6.4 Introduction to Drought Prone Areas Programme**

Drought Prone Areas Programme (DPAP) is the earliest area development programme launched by the Central Government in 1973-74 to tackle the special problems faced by those fragile areas, which are constantly affected by severe drought conditions. These areas are characterized by large human and cattle populations which are continuously putting heavy pressure on the already degraded natural resources for food, fodder and fuel. The major problems are continuous depletion of vegetative cover, increase in soil erosion and fall in ground water levels due to continuous exploitation without any effort to recharge the underground aquifers.

Though the programme had a positive impact in terms of creating durable public assets, its overall impact in effectively containing the adverse effects of drought was not found to be very encouraging. In addition, many of the States had also been demanding inclusion of additional areas under the programme. With a view to identifying the infirmities in the programme and also for considering the case for inclusion of additional areas under the programme, a High Level Technical Committee was constituted in April 1993 to critically review the contents, methodology and implementation processes of all area development programmes and suggest suitable measures for improvement. The Committee in its Report submitted in April 1994 had attributed the unsatisfactory performance of the programmes to the following major factors:

- Implementation of programme activities over vast areas in a sectoral and dispersed manner  
Inadequate allocations to the programme and programme expenditures thinly spread over large problem areas.

- Programme implemented through government agencies with least or no participation of the local people.
- Taking up of a vast array of activities, which were neither properly integrated nor necessarily related to the objectives of the programme. Based on the recommendations of the Hanumantha Rao Committee, comprehensive Guidelines for Watershed Development, commonly applicable to Drought Prone Areas Programme, Desert Development Programme and Integrated Wastelands Development Programme were issued in October 1994 and were made applicable with effect from 1.4.1995. Subsequently, based on the feedback received from States, Project Implementation Agencies and others concerned, the Guidelines were revised in September 2001.

### **6.5 Objectives**

The basic objective of the programme is to minimize the adverse effects of drought on the production of crops and livestock and productivity of land, water and human resources thereby ultimately leading to the drought proofing of the affected areas. The programme aims at promoting overall economic development and improving the socio-economic condition of the resource poor and disadvantaged sections inhabiting the programme areas through creation, widening and equitable distribution of the resource base and increased employment opportunities. The objectives of the programme are being addressed in general by taking up development works through watershed approach for land development, water resource development and afforestation/pasture development. The recent impact studies sponsored by the Ministry have revealed that with the implementation of watershed projects under Drought Prone Areas Programme, the overall productivity of land and the water table have increased and there has been a significant impact in checking soil erosion by water and wind. The programme has also helped in overall economic development in the project areas, Strategy.

The common Guidelines for Watershed Development provide for a uniform strategy in the implementation of all area development programmes. The main features of this strategy are:

- Area development programmes to be implemented exclusively on watershed basis.
- Programme activities to be confined to the identified watershed of about 500 hectares and to be executed on a project basis spanning a period of four to five years.
- Watershed project to be, as far as possible, co-terminus with village boundary.

- Direct participation of the people in planning and development of watershed areas and maintenance of assets in the post project period.
- Panchayati Raj Institutions have the right to monitor and review the programme at district, block and village levels. They can also function as Project Implementation Agencies if they so desire.
- Voluntary agencies to be given effective role in the implementation of the programme particularly in motivating people, community organisation and training.

## 6.6 Coverage

The Drought Prone Areas Programme was in operation in 627 blocks of 96 districts in 13 States during 1994-95. On the recommendation of the Hanumatha Rao Committee, 384 new blocks were brought into the purview of this programme and 64 were transferred from DPAP to DDP. Consequently, coverage of the programme was extended to 947 blocks of 164 districts in 13 States. With the reorganization of States, districts and blocks, at present the programme is under implementation in 972 blocks of 182 districts in 16 States.

## 6.7 Funding Pattern

Until March, 1999 the funds were shared on 50:50 basis between the Central Government and the State Governments. However, with effect from 1st April, 1999, the funding is shared on 75:25 basis between the Centre and State Government. For completion of ongoing projects that were sanctioned prior to April 1999, the old funding pattern will continue. The projects of 500 ha. are sanctioned under the programme. Until March, 2000 following cost norms were adopted under DPAP for various eco-systems.

S. No.	Eco-system type	Per Ha. Average Cost (Rs.)	Watershed No. Project Cost (Rs. in lakhs)
1	Semi-Arid Region	4,000	20.00
2	Dry-Sub-Humid Region	3,000	15.00
3	Dry Sub-Humid (Hill) Region	4,000	20.00
4	KBK districts of Orissa	5,000	25.00

However with effect from 1.4.2000, uniform cost norms @ Rs.6000/- per ha. have been introduced. These norms are applicable to projects sanctioned during and after 2000-2001. In respect of earlier projects sanctioned up to 1999-2000, the pre-revised cost norms will be applicable.

### **6.8 Physical Performance**

Under DPAP, 18803 watershed development projects covering an area of 94.01 lakh hectares with a total cost of about Rs.4804.20 crore were sanctioned up to 31.3.2004. As on 31.12.2004, out of these, the entire central share of about 4803 projects has been released and thus these projects are deemed to have been completed. During 2004- 2005, 2550 new projects have been sanctioned and these are to be implemented under the Guidelines for Hariyali. These projects shall cover an area of 12.75 lakh hectare, and the total cost for these projects is Rs.765.00 crore involving Central share of Rs.573.75 crore. The Table at Annexure-XXX indicates the number of DPAP projects sanctioned since 1995-96.

### **Significance of Planning for Drought-Prone Areas:**

1. The drought-prone areas form a significant proportion of the country's area.
2. These areas are characterised by low productivity which is a major cause of regional imbalances.
3. These areas are a strain on the country's financial resources.

### **6.9 Components of the strategy are as follows:**

1. Development and scientific management of resources
2. Land improvement
3. Soil conservation
4. Desiltation of tanks, canals and reservoirs
5. Afforestation and pasture development
6. Restructuring of cropping patterns
7. Scientific agronomic practices
8. Livestock development
9. Focus on small and marginal farmers and agricultural labourers

10. Development of infrastructure, availability of funds and civic amenities like roads, drinking water, regulated markets etc.

It is a truly comprehensive programme, because it takes a long-term view and follows a total approach to development. The DPAP projects are under implementation in 628 blocks of 96 districts in 13 states of the country. District is the unit of implementation.

#### **6.10 Some drawbacks of the DPAP are:**

1. Targeting is faulty—at places, small and marginal farmers and agricultural labourers are not benefiting.
2. There are delays caused due to inadequate staff.
3. Lack of experience is reflected in plan formulation.
4. Lack of information regarding potential areas for development affects the pace of implementation.
5. Duplication of efforts leads to inefficiency.

#### **Command Areas:**

The areas fed by an irrigation system like canals, streams, tube wells, tanks, etc. are called command areas. An integrated planned development of command areas is essential because of persistent under-utilisation of irrigation potential, particularly, Tunder major and medium irrigation projects. At the end of 1995-96, the likely utilisation was 79.89 million hectares against the created potential of 89.44 million hectares. This leaves a gap of 9.55 million hectares of under-utilised potential (4.59 million hectares in major and medium and 4.96 million hectares in minor irrigation).

#### **This gap is attributed to the following reasons:**

1. Absence of on-farm infrastructure— channels and drains to take irrigation water to various fields.
2. Failure to switch to appropriate agronomic practices under irrigated conditions.
3. Lack of awareness among farmers.
4. Water loss through seepage and poor maintenance of canals etc.
5. Over-irrigation leads to water logging and salinity, and under-irrigation to failure of crops.

An integrated approach is required because agricultural productivity depends on factors apart from irrigation also, such as inputs and infrastructural facilities. An overall efficiency demands a comprehensive approach including hydronomic and agronomic measures.

### **6.11 Basic Objectives of a Command Areas Programme:**

**The objectives of this programme are two-fold:**

1. Maximum utilisation of precious land and water resources by (i) maximisation of area under irrigation; (ii) checking wastage and loss of water; and (iii) improving yield per unit of land and water through better agronomic practices.
2. Satisfying the ideal of social justice by equitable distribution of irrigation water by reaching the benefits even to small and marginal farmers and those at the tail end of the command area.

### **Command Areas Development Programme:**

To address the problem of unutilised irrigation potential, the Command Areas Development Programme was launched in 1974-75 as a centrally sponsored programme in major and medium irrigation projects. The concept of command areas development (CAD) came up through recommendations of the Irrigation Commission (1972) and observations of the Ministers' Committee on Utilisation of Irrigation Potential.

### **6.12 The main components of the CAD strategy are:**

1. Land levelling and shaping.
2. Construction of field channels and drains.
3. Consolidation of holdings and realignment of field boundaries.
4. Construction of proper warabandi system of fair distribution of irrigation water.
5. Streamlining the supply of inputs and services including credit and extension services.
6. Setting up proper infrastructure such as roads, markets, storage facilities, drinking water etc.
7. Selection and adoption of suitable agronomic practices.
8. Development of groundwater resources to supplement surface irrigation.

## **Desert Development Programme (DDP)**

### **6.13 Introduction**

The desert areas of the country had remained backward in many respects due to difficult physiography varying agro-climatic conditions and distinct socio cultural features. Since the people



living in these areas were facing hardships owing to geo-climatic conditions, the desert development programme was introduced as a centrally sponsored scheme in 1977-78. This is a special programme for the hot desert areas; the Desert Development Programme (DDP) was launched by the Ministry of Rural Development, Government of India during the year 1977-78. In Haryana, this programme has been launched by the Ministry of Rural Development, Government of India during the year 1995-96. The Centre share under the funding pattern under DDP is 75 per cent and State share is 25 per cent (till 1998-99 100 per cent share of Centre for hot arid sandy areas). This programme is implemented in 45 blocks of the 7 districts that are Bhiwani, Hisar, Fatehabad, Sirsa, Rewari, Jhajjar and Mahendergarh. Now this scheme is completed in Haryana 31 Dec, 2012 (HRDD, 2014) and watershed development projects going under the Integrated Watershed Management Programme (IWMP). The activities being taken up for the districts are need based keeping in the view of the conditions of the area to be covered. Generally water conservation work, stock ponds, water channels, gully plugging, percolation embankment, field bunding, afforestation, check dams, pasture development, land levelling, piped water supply for irrigation etc. The main objectives of watershed development projects are developing wasteland/degraded lands, drought prone and desert areas; promoting overall economic development and improving socio-economic condition of the resource poor and disadvantage sections; mitigate the adverse effects of the extreme climate conditions such as drought and desertification of crops; harvesting every drop of rain water for the purpose of irrigation, plantations, fisheries, pasture development etc.; resorting ecological balance by harnessing, conserving and developing natural resources i.e. land, water, vegetative cover; encouraging village community toward sustained community action for operation and maintenance of the assets created and further development of the potential of the natural resources in the Watershed.

#### **6.14 Objectives**

The basic object of the programme is to minimise the adverse effect of drought and control desertification through rejuvenation of natural resource base of the identified desert areas. The programme strives to achieve ecological balance in the long run. The programme also aims at promoting overall economic development and improving the socio-economic conditions of the resource poor and disadvantaged sections inhabiting the programme areas.

#### **6.15 Coverage**

Upto 1994-95, Desert Development Programme was under implementation in 131 blocks of 21 districts in 5 States. The Hanumantha Rao Committee recommended:

- Inclusion of 32 new blocks; and
- Transfer of 64 blocks from DPAP to DDP

Inclusion of new blocks and transfer of blocks from DPAP to DDP was agreed to. Thus, from 1995-96 total blocks covered under DDP became 227 in 40 districts of 7 States. Subsequently, with the re-organization of Districts and Blocks, the programme is now covered in 235 blocks of 40 districts in 7 States. The corresponding physical area under the programme is about 4.57 lakh sq. kms.

### **6.16 Cost Norms & Funding pattern**

The Central share under each type of eco-system under DDP was as under:

Hot Arid Non Sandy Areas	75%
Hot Arid Sandy Areas	100%
Cold Arid Areas	100%

The above Central share was applicable up to 31st March, 1999. With effect from 1st April, 1999, the programme is being funded on the basis of 75:25. In all these cases for the watershed projects being sanctioned on or after this date. From 1.4.1995 till 31.3.2000, the cost of each ranged between Rs. 22.50 lakhs to Rs. 25 lakhs. With effect from 1.4.2000, a uniform rate of Rs. 30 lakh per project has been prescribed.

### **6.17 Physical Performance of the DDP**

Since the adoption of watershed approach in the year 1995-96 till 2005-2006, 13476 projects have been sanctioned to treat 67.38 lakh hectares of arid area. The year-wise details of projects sanctioned from 1995-96 to 2005-06 are at Annexure 2. The project period of 2194 projects sanctioned from 1995-96 to 1998-99 has however been over; of these 1894 projects are deemed complete and funding stopped to 300 projects. Among 11282 projects sanctioned from 1999-2000 to 2005-06, 689 projects are deemed complete and 10593 projects are ongoing as on 31.3.2006. Thus, a total of 2583 projects are deemed complete, funding stopped to 300 projects and 10593 projects are ongoing.

The Union Government sanctions new projects every year taking in to consideration primarily the DDP coverage in the States, performance of the on-going projects, capacity to absorb new projects and annual budget outlay etc. During the year 2005-06, 2000 new watershed projects have been sanctioned under DDP to treat an area of 10 lakh hectares at a total cost of Rs. 600.00 crore over a

period of five years. The Central share is Rs. 450 crore out of which the amount of first installment i.e. Rs. 67.50 crore has been released to the programme States. These projects will be implemented in accordance with the provisions contained in the Guidelines for Hariyali.

### 6.18 Area Treated

The area treated under DDP so far is given below:

From inception till 31.3.1995 - 5.15 lakh ha

From 1.4.1995 till 2005-06

Year	Area treated in Lakhs hectares
1995-96	2.02
1996-97	1.31
1997-98	1.40
1998-99	1.60
1999-2000	2.00
2000-01	3.41
2001-02	3.56
2002-03	4.39
2003-04	4.72
2004-05	4.89
2005-06	6.01
Total	35.31

### 6.19 Financial Performance

- A. The total amount committed for these 13476 projects (sanctioned from 1995-96-2005-06) is Rs. 3817.68 crores of which Rs. 2952.67 crores is the central share. From 1995-96 to 2005-2006, an amount of Rs. 1568.79 crore has been released. The year-wise details of funds released to the programme States since 1995-96 to 2004-2005 are at Annexure 3. The budget outlay for 2006-067 under DDP is Rs.270crore against which Rs. 7.67 crore has been released upto 19.5.2006

- B. A review of the progress made in implementation of 13476 DDP Projects sanctioned from 1995-96 till 2005-06, in terms of amount that should have been claimed and amount actually claimed (as on 31.01.2006) indicates that the financial performance of this programme for all the States is about 72.34.

### **6.20 The following are desert areas in India:**

- Hot Desert areas of Rajasthan, Gujarat, and Haryana
- Cold desert areas of Ladakh and Himachal Pradesh.

#### **Cold Desert of Ladakh:**

Location and physical characteristics of Ladakh cold desert:

- Ladakh is in Great Himalayas
- It is eastern of Jammu and Kashmir
- Karakoram range in the North
- Zaskar range is in south
- Indus river and its tributaries flow in the region.
- Many Galciaers such as Gangri is in Ladakh.
- The altitude varies from 3000 meters in Kargil to 8000 meters in the Karakoram.

Due to high altitude:

- Climate is extremely cold and dry
- Atmosphere is thin
- Temperature varies from -40 degree c to 0 degrees centigrade

Economic opportunity:

- No forest
- There are scanty patches of grasses and shrub for animal rearing
- Summer; apple, Apricorn, walnut tree boom
- Tourism from both international and domestic visit to Gompas, Monasteries, Glaciers, and attending the festivals.
- There are scanty water and fuel

#### **Hot Desert in India:**

Challenges:

- Extreme temperature, water unavailability, unreachability.

Economic opportunities:

- Energy generation, Mining, farming, and tourism.

We can summarize that the following are major problems in the desert areas that can be managed through planning:

- Water shortage
- Depletion in Vegetation
- Increase soil erosion

For solving the above problems, the Desert Development Program (DDP) was launched in 1977-78 with the following aims:

- Minimize the adverse effect of desert and control desertification by the restoration of natural resources to achieve ecological balance in long run.
- Aim to overall economic development and improve the socio-economic development of poor and disadvantaged section.

In the year 1994-95, the Desert development program was under Rural development, and it had 131 blocks and 21 districts spread in 5 states.

Integrated Watershed development program for desert areas

In the year 1995-96, the Hanuman Rao committee evaluated the Drought Prone development Program and Desert Development Program and in recommendation:

- New Block added in Desert Development Program
- Some blocks transferred from Drought prone areas development to Desert Areas Development.

## **Integrated Wasteland Development Programme (IWDP)**

### **6.21 Introduction**

The most important natural resource, on which all human activity is based, is land.

Man's unstoppable progressive development has, however, damaged our land resource base considerably. Further, land also suffers from various kinds of soil erosion, degradation and deforestation. The estimates of the extent of area suffering from land degradation vary from 38.40 million hectares to 187 million hectares. The National

Remote Sensing Agency (NRSA) of the Department of Space, Hyderabad, has estimated the extent of wastelands to be 63.85 million hectares, which is about 20% of the total geographical area of the country. To harness the full potential of the available land resources and prevent their further degradation, the development of wastelands is of great significance. The problem of degraded land and its management is complex and multi-dimensional and its development requires a scientific, holistic and innovative approach. The question is whether such land is really *a waste* or if it can be

made suitable for farming again. This unit is an attempt to explain the guiding principles, the basic features and the institutional framework for the implementation of Integrated Wasteland Development Programme.

## **6.22 Historical Background/Evolution of the Programme**

Unprecedented population pressure and demands of society on scarce land, water and biological resources and the increasing degradation of these resources are affecting the stability and resilience of our ecosystems and the environment as a whole.

Globally, the expansion of human settlements and infrastructure, intensification of agriculture and expansion of farming into marginal areas and fragile ecosystems, emphasizes the need for integrated planning and management of land resources.

These trends are also exacerbating conflicts over access and rights to land, water and biological resources; and also increasing competition between agriculture and other sectors for declining per capita land resources. They affect food security in many developing countries, global environmental balance and the well-being of present and future generations. The challenge is to develop and promote sustainable and productive land use systems and to protect critical resources and ecosystems through balancing land, water and other resource uses, providing a basis for negotiation, participatory decision-making and conflict resolution among stakeholders, as well as providing an enabling political, social and economic environment.

To accelerate the pace of the development of wastelands and degraded lands and to give focused attention to the issues concerned, the Government set up a National

Wastelands Development Board (NWDB) in 1985 under the Ministry of Environment and Forests. Later, a separate Department of Wastelands Development was created in the Ministry of Rural Development in 1992 by transferring the National Wastelands Development Board from the Ministry of Environment and Forests. With this, all non-forest wastelands have come under the purview of the Department of Wastelands Development for purposes of development. In April 1999, the nomenclature of the

Department of Wastelands Development was modified to the Department of Land Resources (DoLR) to act as the Nodal Agency at the national level in the field of Land Resources Management. All land based Programmes/schemes, which were earlier being implemented by different Departments in the Ministry of Rural Development, have been brought within the purview of this new Department of Land Resources.

The Integrated Wastelands Development Programme (IWDP) had been under implementation since 1989-90 by the NWDB in the Ministry of Environment and Forests, and was transferred to the Ministry of Rural Development in July 1992. The IWDP envisages development of all the non-

forest wastelands in the country. The basic approach in implementation of this programme was modified in April 1995 when the Guidelines for Watershed Development for the development of problem lands through watershed approach came into force.

### **6.23 Objectives of IWDP**

1. An integrated wastelands development to enhance their productivity
2. Aims at rural employment besides enhancing the contents of people's participation in the wastelands development programmes at all stages.

This programme implemented for improving the productivity of waste & degraded lands keeping in view the poverty, backwardness, gender & equity is Integrated Wasteland Development Programme. Development of wastelands mainly in non-forest areas aimed at checking land degradation, putting such wastelands of the country to SUSTAINABLE use & increasing bio-mass availability especially that of fuel wood, fodder, fruits, fiber & small timber. This scheme is under implementation since 1989-90, and has come to this Department along with the National Wastelands Development Board. The development of non-forest wastelands is taken up under this Scheme. The scheme provides for the development of an entire micro watershed in a holistic manner rather than piecemeal treatment in sporadic patches. The thrust of the scheme continues to be on development of wastelands

The IWDP is in operation since 1989-90 aiming at checking land degradation, putting wastelands to sustainable use and increasing the bio-mass availability, specially fuel, wood & fodder. This project is in implementation in Bangalore(R), Kolar, Chitradurga, Tumkur, Mandya, Davanagere, Shimoga, Mysore, Belgaum, Gulbarga, Raichur, Chamarajanagar, Hassan, Haveri, Bellary & Bidar districts.

During 2005-06 it was planned to develop an area of 50,066 hectares with an outlay of Rupees 2901.67 lakhs, against which an area of 27279 hectares was developed by incurring Rupees 1278.18 lakhs.

### **6.24 Programme Guidelines and Guiding Principles**

In April 1993, the Ministry of Rural Development constituted a high-level Technical Committee under the chairmanship of Prof. C.H. Hanumantha Rao, who was earlier a Member (Agriculture) of the Planning Commission, to thoroughly review and recommend suitable means of implementing the Central Sector Area Development Programmes (being administered by the Ministry, namely the Drought Prone Areas Programme and the Desert Development Programme) more effectively so as to bring about visible and perceptible impact in drought proofing and the control of

desertification in the problem areas covered by these programmes. After a critical examination of the mode of implementing and the performance of the programmes, field visits and interaction with all the stakeholders, the Technical Committee brought out its Report in April 1994, which *inter alia* recommended that:

- 1) All the Area Development Programmes being administered by the Ministry of Rural Development, including the Integrated Wastelands Development Programme (IWDP), should have a watershed as the basic unit of development.
- 2) Small watersheds, each of a size of about 500 hectares, which may cover one village as far as possible, be identified for development.
- 3) The small watershed, so identified at the village level, should be managed in terms of its planning, implementation and maintenance by the local people themselves with the Government and the non-Government Organizations providing the necessary technical and financial support services.

On the basis of the recommendations of the Hanumantha Rao Committee (1994), the Ministry of Rural Development issued “Guidelines for Watershed Development” and brought the three Area Development Programmes of the Ministry, viz. DPAP, DDP and IWDP under the purview of these Guidelines. These Guidelines became operational with effect from April 1, 1995.

Since then, *watershed development approach* for area development and *people’s participation* in all aspects of the implementation of the area development programmes of the Ministry have become the Guiding Principles in the administration of these programmes.

### **Revision of Guidelines**

After implementing the programme for over 5 years, a need was felt by both the State Governments as well as the Department of Land Resources for fine-tuning certain provisions of the Guidelines to make them more suitable to the local requirements. Accordingly, the Guidelines for Watershed Development were revised in August 2001 to make them more focused, transparent and easy to follow.

**Role of Panchayati Raj Institutions:** In order to ensure people’s participation in the implementation of watershed projects under the three Programmes, the Guidelines for Watershed Development provided for a detailed institutional framework at all levels of implementation, particularly people’s organisations called the Watershed

Associations, the Watershed Committees, the Self Help Groups, the User Groups, etc. at the village level. In this institutional framework, the Gram Panchayats and other PRIs were not given the pivotal role, since the PRI framework was not strong enough at the time of framing the Guidelines for Watershed Development in 1994-



1995. The revision of Guidelines in 2001 did envisage a role for PRIs in the implementation of watershed projects. However, the concept of Watershed Association and Watershed Committee at the village level was retained for implementing the projects.

Following the 73rd and the 74th Amendments to the Constitution of India, the Panchayati Raj Institutions (PRIs) have been mandated with an enlarged role in the implementation of developmental programmes at the grass-roots level. The Ministry of Rural Development is committed to empower PRIs and have been impressing upon the State Governments to devolve the necessary financial and administrative powers to the PRIs for self-governance, particularly in planning, implementation and the management of economic development activities in rural areas. Watershed Development has been included in the list of subjects to be devolved to the PRIs. The institutional framework of Watershed Associations and Watershed Committees depicted them as parallel bodies at the village level as far as the implementation of Watershed Programmes was concerned, and there was very little coordination between them and the Gram Panchayats/Gram Sabhas. On devolution of the necessary powers, the PRIs are expected to perform far better than the Watershed Associations/Committees, as they are:

- equipped with the statutory rights and a mandate for natural resource planning,
- in a position to plan according to people's wishes and integrate watershed management into wider development activities,
- in a position to draw the services of line departments in an integrated way and press for political pressure on line departments at higher levels,
- potentially equipped with the powers to impose local taxes or user charges and
- committed to making "reservations" for the representatives of women and the weaker sections as per the Constitutional provisions.

Thus, for the Ministry of Rural Development to fulfil their constitutional obligation of empowering PRIs, it was felt necessary to bring in suitable modifications in and amendments to the existing institutional framework for the implementation of Watershed Development Programmes. With this objective, the Prime Minister of India launched a new initiative called *Hariyali* on 27th January 2003. It seeks to empower the PRIs, both administratively and financially, for the implementation of the Watershed Development Programmes of the Ministry of Rural Development. Accordingly, the Ministry have modified the existing provisions and incorporated the new initiative in the Guidelines. The guidelines so modified are now called the *Guidelines for Hariyali*, which are commonly applicable to IWDP, DPAP and DDP. These Guidelines became operational with effect from April 1, 2003.

### **6.25 Salient Features of the Guidelines**

1. The Guidelines are designed in such a way that the user communities have to take the centre stage in the implementation and management of area development programmes in which the Government participates.
2. Since degradation usually occurs and gets aggravated through over exploitation of lands under public/common ownership, emphasis is on the development of common/community lands and not on the privately owned lands.
3. The watershed community comprises landed as well as landless people, agricultural and non-agricultural labour, village artisans, weaker sections like the scheduled castes and scheduled tribes, women, etc. Though watershed development benefits primarily the landed people, emphasis is given to equitable distribution of benefits resulting from the development of the watershed area among all the sections of people inhabiting this area.
4. An exclusive institutional framework has been prescribed for bringing about active community participation in all the aspects of watershed project management, viz. watershed planning, execution of development works and post-project maintenance.
5. Emphasis is placed on sustainable rural livelihood support systems through Self- Help Groups from the landless and the weaker sections of the watershed community and the User Groups built around each of the community assets created under the project, thus securing the participation of women as well as the landless also in watershed development.
6. In order to enable the village community and all other stakeholders participate actively in the watershed development activities, specific provisions have been made for their capacity building and skill development which is a vital component of the programmes and is a pre-requisite to initiate actual development works on the ground.
7. Decentralisation of the processes of planning and decision-making is achieved through delegation of necessary powers to various levels of programme administration and management, i.e. the State, the District and the village/watershed levels.
8. Community participation and the feeling of owning the assets created under the programme are brought about through insistence on public contributions to the project cost, either in cash or kind or voluntary labour. The beneficiaries of various development works/assets of the project are required to contribute at least 10% of the project cost by these means.
9. For watershed development, emphasis is placed on the adoption of low-cost technologies that use local materials and are easily operable and maintainable by the local people. Use of indigenous technical knowledge is encouraged in all aspects of watershed development.

10. Post-project management and sustainability of the project is ensured by maintaining a Watershed Development Fund created out of public contributions. It is placed at the disposal of the village level managing body for purposes of maintaining the public assets after the project gets completed and whenever such necessity arises.

### **6.26 What is a watershed?**

Simply stated, a watershed is a geo-hydrological unit of landmass, from where rainwater drains through a common drainage point. The ridges of the watershed form its boundaries, which slope down to the valley and flat land and the rainwater falling in this catchment area runs off from the uplands downwards through small streams and gullies into the main natural drainage system of the watershed, usually a river. If the land surface of the watershed area is not adequately covered with vegetation, surface soil gets carried away by the rainwater run off causing severe soil erosion problems, widening of gullies and silting of streams and water bodies downstream.

Watershed development, therefore, involves scientific treatment of the watershed area from the ridges to the flat lands, in that order of priority. To control water run-off, suitable vegetative cover in the form of plantations, horticulture, agro-forestry, pastures and agricultural crops, as demanded by the land capability, are required to be taken up along with soil conservation measures, like contour bunds, gully plugs, contour trenches, rock fill dams, etc. These measures, besides aiding in soil retention and arresting erosion, will also help in improving the *in situ* soil-moisture conservation.

For water resource conservation, its optimal utilization and for recharging of ground water aquifers, water-harvesting structures like check dams, farm ponds, percolation tanks, etc. are usually taken up.

### **6.27 Components of Watershed Development**

The various steps and components involved in watershed development comprise:

- i. Identification and demarcation of the watershed area on scientific basis.
- ii. Prioritisation of watershed areas on the basis of pre-determined criteria and prioritisation index prepared for the execution of developmental works in the worst affected watersheds first.
- iii. Conducting a benchmark survey of the watershed to assess the extent of the problem and pre-project socio-economic situation of the local community. This provides the base to assess project benefits through a post-project impact evaluation.
- iv. Land use capability studies and land use planning aspects: these are necessary to reorient the present production systems to the desirable cropping patterns and activities that are in

consonance with what various soils in the watershed are capable of supporting on a sustainable basis.

- v. Identification of suitable technologies, local as well as improved, for the development of agriculture, horticulture, forestry, pastures, etc. on the one hand and soil and water conservation on the other.
- vi. Building of a suitable institutional framework for effective participatory approach in all the aspects of watershed management (planning, execution and maintenance) at the State, the District, the Block and the Village/watershed levels.
- vii. Mobilisation and organisation of the watershed community involving massive contact programmes to inform, educate and familiarize the local population about the importance of watershed development in resource conservation, economic development, for improving people's quality of life and their environment.
- viii. Training of project functionaries at the various levels of government. This involves two distinct components. One is concerned with reorientation and changing the general mind-set of the government personnel from that of providers to that of facilitators in a people-led programme. The other is concerned with the technical training of both the government functionaries at various levels and the village leaders vested with the responsibility of project management at the local level.
- ix. Preparation of the watershed development plan for each selected watershed by people's organisations with the technical support of subject matter specialists from the government/non-government organisations acting as the project implementers. This plan must consist of a perspective treatment map and the treatment plan for the watershed, time phasing of physical works and the financial requirements over the project period, details of the post-project management arrangements, etc.
- x. Project execution and release of funds in suitable instalments in accordance with the project performance in terms of progress achieved in physical works and financial expenditure.
- xi. Project monitoring, concurrent evaluation and mid-course corrections.
- xii. Project completion, approval of Completion Report and withdrawal of external agencies from the project after the post-project management arrangements are made and the project and its assets are transferred to the peoples' organizations/ village panchayat concerned for maintenance.
- xiii. Post-project impact evaluation.

## **6.28 Salient Features of the Programme**

### **1. Coverage of the Programme**

The programme is implemented in all those districts and blocks that are not covered under either DPAP or DDP. To avoid duplicity, it is ensured that no other development work of similar nature was taken up or is under way in the area identified for the IWDP watershed project.

## **2. Project Mode**

The programme is implemented exclusively on watershed development project basis.

A Watershed Development project has to be implemented over a period of 5 years during which period financial assistance is provided to the implementing agencies.

### **Criteria for the Selection of a Watershed Project**

- i. The watershed area selected for development should have a preponderance of wastelands.
- ii. The area identified for treatment should include a preponderance of common lands and lands belonging to SCs/STs, small and marginal farmers and other weaker and poor sections of the project area.
- iii. The watershed selected for development should have a large population of SCs/ STs dependent on it.
- iv. Watersheds should be selected for development in such a way that they are contiguous to one another to derive the maximum benefit out of the development works.
- v. Preference should be given to those areas that have not received attention previously for comprehensive development.

### **6.29 Major Activities of a Watershed Project**

These can be broken down into three categories: (a) pre-project activities like building of the relevant village level organizations, community mobilization, capacity building/ training of the watershed functionaries, survey and preparation of the watershed treatment plan and its approval, (b) development works for soil-moisture conservation, water resources development and development and/or regeneration of green cover on the reclaimed lands and (c) post-project activities like adoption of suitable production technologies, maintenance of public assets created under the project, etc.

It is important that development works indicated in (b) above are taken up following the ridge-to-valley principle of watershed development. That is, the uplands or the ridge region of a watershed should be treated first, followed by the development of slopes and drainage lines and finally the development of the low lands or the valley region. This will ensure control of the water run-off and the resulting soil erosion and silt flow from the upper ridges to the valleys and river systems downstream. An indicative list of these development works is given below.

- a) Development of small water harvesting structures such as low-cost farm ponds,

*nalla* bunds, check-dams, percolation tanks and other ground water recharge measures.

- b) Renovation and augmentation of water sources, desilting of village tanks for drinking water/irrigation/fisheries development.
- c) Fisheries development in village ponds/tanks, farm ponds, etc.
- d) Afforestation including block plantations, agro-forestry and horticultural development, shelterbelt plantations, sand dune stabilization, etc.
- e) Pasture development either by itself or in conjunction with plantations.
- f) Land Development including *in situ* soil and moisture conservation measures like contour and graded bunds fortified by plantation, bench terracing in hilly terrains, nursery raising for fodder, timber, fuel wood, horticulture and non-timber forest products.
- g) Drainage line treatment with a combination of vegetative and engineering structures.
- h) Repair, restoration and upgrading of the existing common property assets and the structures in the watershed to obtain the optimum and sustained benefits from the previous public investments.
- i) Crop demonstrations for popularizing new crops/varieties or innovative management practices.
- j) Promotion and propagation of non-conventional energy saving devices, energy conservation measures, bio-fuel plantations, etc.

### **Funding Pattern**

IWDP is a Central sector scheme and watershed development projects under the programme are sanctioned at a cost norm of Rs. 6,000 per hectare of the area identified for treatment. This project cost is required to be shared between the

Central and State Governments in the ratio of Rs. 5,500: Rs. 500 per hectare respectively.

### **Allocation of Funds within a Project**

Broadly, funds earmarked for a watershed project must be spent on the following components in accordance with the percentage indicated against each head.

- 1) Community mobilization and capacity building: 5%
- 2) Works component: 85%
- 3) Administrative overheads: 10%

### **6.30 Institutional Framework for Implementation**

For the implementation of projects under IWDP, there is an elaborate and welldefined institutional structure covering various levels. This structure is described below.

**National level:** The Department of Land Resources, the Ministry of Rural Development, the Government of India, New Delhi, is the nodal agency at the national level responsible for getting the programme implemented. The Department is responsible for evolving policies for smooth implementation of the programme, its funding, monitoring its progress and evaluating the overall impact of the programme in relation to its objectives. The Department also plays an advisory role in so far as assisting the State governments and District administrations in the smooth implementation of the programme.

**State level:** Normally, the Department of Rural Development is the nodal agency responsible for the implementation of IWDP at the State level also. However, the State Government may designate any other related department like Agriculture to be the State nodal agency. The State level nodal department acts as an intermediary between the Central Government and the Districts in so far as the implementation of IWDP is concerned. It is responsible for programme policy implementation, advising, assisting and guiding the districts and for monitoring, reviewing and evaluating the progress of implementation in the State. It is also responsible for assessing the training requirements of all the state/district functionaries involved in the implementation of the programme and then for coordinating the organization of the required training activities.

**District level:** The Zilla Parishad (ZP) or the District Rural Development Agency (DRDA), as the case may be, is the nodal agency at the district level for the implementation of the programme. In the states where the ZPs have yet to come into operation with adequate powers and resources as envisaged under the Panchayati Raj Legislation and so have yet to acquire adequate technical capacity in watershed development, DRDAs have been designated to supervise the implementation of IWDP.

The district nodal agency works under the supervision and guidance of the State and Central Governments and is responsible for the selection of watersheds for the implementation of IWDP projects; identification and appointment of suitable implementing organizations; approval of the action plans/watershed treatment plans in the district and for reviewing, monitoring and evaluating the progress of the implementation of the IWDP projects. The agency is also responsible for arranging the requisite training programmes for the functionaries involved in watershed development in the district including district officials, Project Implementing Agencies and Watershed Development Team members.

The IWDP projects sanctioned to a district are, generally, implemented by the ZP/DRDA through Project Implementation Agencies (PIAs) specifically identified for the purpose. Preferably, an Intermediate Panchayat/Panchayat Samiti may be the PIA for all projects sanctioned to that

particular Block/Taluka. In cases where these Panchayats are not adequately empowered or technically equipped, the ZP concerned can act as the PIA itself or may appoint a suitable district level line department like Agriculture, Forestry/Social Forestry, Soil Conservation, etc. or an agency of the State Government or the local university or any other suitable institute or a reputed Non-Governmental Organization as PIA. Nonetheless, the State Governments should make efforts to empower the Panchayats and build their capacities so that they may ultimately be in a position to take up the responsibility of implementing the projects independently.

The PIA carries out its responsibility through a multi-disciplinary team called the Watershed Development Team (WDT) which has at least four subject matter specialists from the disciplines of forestry/plant sciences, animal sciences, civil/agricultural engineering and social sciences. The PIA may utilize the services of its own staff for this purpose or may hire outside experts wherever necessary. The PIA, through this WDT, is responsible to create awareness about the importance and the advantages of area development on watershed basis and mobilize the requisite public participation in the project areas allocated to it. Arranging for training of all functionaries at the village and watershed level in different aspects of watershed project management is also its responsibility.

**Watershed/Village level:** At the field level, IWDP projects are implemented by the Gram Panchayats concerned, under the overall supervision and guidance of the WDT. All works executed by the Gram Panchayats should have the final approval of the Gram Sabha, which exercises overall control of the functioning of the Gram Panchayat. If necessary, the Gram Panchayat may get specific project works, involving a higher degree of technical competence, executed by outside agencies like the government technical departments, non-governmental organizations, etc.

#### **Procedure for Sanctioning Projects**

Procedure for the sanction of projects under IWDP in a financial year: The Department of Land Resources, in consultation with the State Governments, first prioritises the districts for the purpose. In doing so, the following factors are considered.

- A. Preference is given to the districts that
  - i. Have a large area of wastelands, and
  - ii. Have not been sanctioned any watershed projects earlier or do not have any ongoing projects.
- B. Those districts, which reflect a high degree of backwardness and incidence of poverty, are considered on priority basis.

#### **6.31 Monitoring the Performance**



During its implementation, the programme is monitored at frequent intervals by all the relevant implementing agencies comprising the Central and the State Governments, the ZPs and the DRDAs. Independent evaluators from reputed government and nongovernment organisations, universities, research and training institutes and professional consultants are also engaged for mid-term evaluation of the programme to obtain feedback on the progress of implementation and to check whether it is being implemented as per the guidelines and approved action plans. The mid-term evaluation is conducted after 45% of the project cost is released to the districts and the outcome of the evaluation is utilised by the Department of Land Resources for mid-course corrections wherever necessary.

From these monitoring and evaluation exercises, certain drawbacks in programme implementation have been observed. These are briefly listed below.

- i. Sometimes the watershed treatment plans do not reflect the local people's aspirations and requirements adequately as they are prepared on the basis of the perceptions of the PIA. This also indicates a low level of people's involvement in the project.
- ii. Community mobilisation and training activities, which are more crucial for ensuring people's participation, have not been given due importance.
- iii. In some cases, there have been undue delays at the level of ZPs/DRDAs in approving the watershed treatment plans and also in releasing funds received from the Central and the State Governments to the grass-roots implementing agencies. These delays lead to ad hoc execution of unapproved works as well as extension of project period much beyond the prescribed limit.
- iv. Sometimes, development of private lands was taken up extensively at the cost of planning for and development of degraded community land in the project area.
- v. In some cases people have not been adequately sensitised on the importance of public contributions to the Watershed Development, which is crucial to inculcate a sense of ownership of the project among the watershed community.
- vi. In some cases, due importance has not been given to a) the formation of Self-Help Groups from amongst the landless and weaker sections of the village community and b) the provision of the necessary training and financial assistance to start suitable income generating activities.
- vii. Plantation works that are necessary to improve the green cover of the degraded lands, particularly on those owned by the community, have been given the lowest priority in some cases.

- viii. Even where plantation works were taken up, the arrangements for their proper upkeep, maintenance and management for the benefit of the village community have either been absent or weak.
- ix. Arrangements made by the PIA for post-project maintenance of the assets created under the project and ensure their sustainability are not clear.
- x. In some cases, the project action plan did not reflect any formal arrangements made for the equitable distribution of benefits from the project amongst various sections of the village community.
- xi. Suitable production technologies for judicious utilisation of resources developed under the project, like water and land, have more or less been ignored resulting in improper and wasteful utilisation of these valuable resources.
- xii. Convergence of the related development schemes in the watershed area has either been absent or weak.

In spite of these infirmities, the overall impact of the programme in the problem areas has been very positive and encouraging. The Department of Land Resources has taken suitable corrective measures by way of more stringent monitoring and financial control to eliminate the above weaknesses in programme execution, which should result in enhanced benefits and a more positive impact.

### **Future Strategy**

As has been seen earlier, due to financial constraints at the national level, annual allocations to the programme are not commensurate with the actual requirements and the problem at hand. Obviously, the Government alone cannot tackle the problem on its own and therefore, there is an urgent need to bring in other important players into picture for speedy and effective development of wastelands. Important among these other players, who are also interested in involving themselves in wasteland development, are the corporate sector, financial institutions and external donors. The roles of these actors whose support could be integrated into wastelands development strategies in future are indicated below.

**Corporate Sector:** It is worthwhile to consider giving the government land on lease to those corporate bodies that can improve its productivity and utilise it for commercial purposes. The private sector can come in a big way in this venture through a viable programme of contract farming.

**Financial Institutions:** With improved natural resource base of the project areas the village community would be requiring credit facilities for purchasing improved seeds, fertilizers and other such inputs for judicious utilisation of these developed resources.

Further, to sustain the enhanced productivity and increased production levels of the project areas, it is necessary that suitable credit facilities are available to the local community to develop necessary forward linkages like godowns, safe storage of surplus produce and food-processing facilities, etc. Necessary infrastructure and marketing network also need to be developed. With the improving economic status of the people, demand for consumer goods from outside would increase progressively, for which local commercial ventures need to be encouraged. For all these requirements,

NABARD and other commercial banks can contribute in a big way.

The Ministry of Rural Development has constituted a Task Force to examine the areas of support that can be obtained from corporate bodies, banks and other financial institutions for wastelands development.

**External Donors:** Traditionally, external assistance is available to several organisations in the country for the provision of social inputs like education, health, sanitation, livelihood activities, etc., particularly for the underprivileged. It is important that such assistance is channelled properly for comprehensive development of watershed areas.

### **6.32 Conclusion**

In this unit, you have read about the efforts made by the Government of India for the development of vast areas of wastelands, which can be improved to productive use. You have seen that the Integrated Wastelands Development Programme under implementation aims to develop the wastelands in an integrated manner so that the natural resource base of the degraded areas is regenerated and brought back to productive use resulting in the overall economic development of the rural communities depending on these areas for their livelihood.

You read that IWDP is implemented exclusively on watershed basis and by the people themselves inhabiting the project areas. This is a people's programme where the Government participates. We learnt about the Guidelines that govern the implementation of the programme, the institutional framework specified at various levels for the purpose and the salient features of the programme. Further, we learnt about some drawbacks in the process of implementing the programme and the corresponding efforts made to overcome them. Despite these weaknesses, we have seen that the programme has generated significant impact— land quality has improved, more water is available and more areas are under the green-cover now.

We have learnt that the problem of wastelands development is so large that the finances available for the programme annually are not adequate to tackle the problem speedily and in a time-bound manner. Obviously, we require active participation of other players like the corporate sector, financial institutions and external donors in order to comprehensively develop our wasteland areas.

## **Social Forestry and Joint Forest Management**

### **6.33 Introduction**

Forests form the life support system for a population of nearly 147 million people living in about 1,73,000 villages of India inside and along the fringes of forests. The state of forests has been intrinsically related to the economic well-being of the rural poor in these villages. Increasing population, development programmes and accordingly the invasive use of forests has caused shrinking of forest areas and therefore increase in the pressure for forest products and services. Naturally the rural poor in the vicinity have been the worst affected lot.

According to a study of Forest Survey of India (FSI), the total requirement of fuel wood, probably the most important forest produce for villages, in the country was about 201 million tons in 1996. Projected demands of fuel wood for 2001 and 2006 were/are 223 and 247 million tons respectively (Planning Commission, 2001). The present availability on a sustainable basis from the existing forests has been estimated at only 17 million tons. It is believed that about 51% of the total demand, much more than is available, is met from forests. Similar pressures exist for timber, fodder and other forest products. Productivity of our forests as estimated is 1.3 cubic meters per ha per year compared to the global average of 2.10 cubic meters per ha per year in terms of timber and firewood. The diversion of forests for various development needs also has contributed to the depletion of these resources.

Conventional rural development programmes have seldom taken into consideration this situation and there have not been any specially designed rural development models for the rural areas with populations wholly dependent on the forest resources for subsistence. As a result, various programmes formulated with good intentions have often resulted in conflicting situations, especially in the context of the conservation status of natural resources like forests and wildlife. This has caused further impoverishment of the people. The maintenance of forest resource base has always been a critical factor in the life of forest fringe communities, but it has seldom been seen as a means of rural development.

Concepts of social forestry and participatory forest management have emerged as a response to these circumstances. This unit aims at providing you an understanding of the concepts and programmes associated with *the forestry aspect* of natural resource management in a rural

development environment. Also, the recent trends in the management of forest resources as applied in the social and legal framework of the empowerment scenario of rural life are introduced.

### **6.34 Social Forestry: Perspective**

The National Commission on Agriculture, considering the need to expand the tree resource base of the country, suggested the adoption of *social forestry* in rural areas in 1976. The Sixth Five Year Plan period (1980-85) gave a boost to the afforestation activities with the Centrally Sponsored “Social Forestry including Rural Fuel Wood Plantations” scheme. A series of social forestry projects followed with the support of international agencies including the World Bank, SIDA, DANIDA, US AID and others.

Social forestry projects aimed at taking the pressure away from the forests by afforestation of all the unused and fallow lands including village common lands, the Government wasteland and Panchayat lands. Tree planting in and around agricultural fields, along railway lines, roadsides, river and canal banks were carried out to meet the growing demand for timber, fuel wood, fodder, etc., thereby reducing the pressure on the traditional forest area.

It was also considered as a means of putting to the optimum use the fallow and degraded lands. Community Development schemes like NREP and RLEGP too had the components of social forestry, but the implementation through the Government establishment was aimed at planting trees as mentioned above. People’s participation was envisaged through awareness creating campaigns and extension services.

### **6.35 Types of Social Forestry in India**

#### **6.35.1 Farm Forestry:**

Farm forestry is the management of trees for a specific purpose within a farming context. Typically these are timber plantations on private land. However, it can be applied to a range of enterprises utilizing different parts of the tree and managed in a variety of ways.

#### **Benefits:**

Farm forestry can produce multiple benefits for the farm, the environment and the community. The benefits to the landholder include:

1. Shelter for stock, pasture and crops
2. Additional and diversified earnings
3. Improved living environments
4. A buffer against the cyclical downturns in prices and in drought, frost and flood

5. Improvement and maintenance of soil and water health through water table reduction
6. Increase in capital value of the plantation

The benefits to the environment and community are:

1. The creation of new jobs and industries
2. Sustainable management of natural resources
3. Increases in biodiversity
4. It itself is an industry that easily fits around the activities of most agricultural enterprises
5. Prices of wood products are relatively stable compared to most agricultural products
6. Long term productivity is not weather-dependent

### **6.35.2 Agro-Forestry:**

This is the combination of agriculture and tree growing in order to produce both agricultural products and tree products on a commercial basis. The purpose of this scheme is to gain positive interactions between the two systems at both the paddock level and the enterprise level.

The two systems may be fully physically integrated, or treated as separate entities within a single business enterprise. It is therefore ideally suited to the landholder seeking to enter farm forestry on a small scale, whilst maintaining an existing agricultural enterprise.

#### **Impacts:**

Agro-forestry systems can be advantageous over conventional agricultural and forest production methods through increased productivity, economic benefits, social outcomes and the ecological goods and services provided.

Biodiversity in agro-forestry systems is typically higher than in conventional agricultural systems. Agro-forestry incorporates at least several plant species into a given land area and creates a more complex habitat that can support a wider variety of birds, insects, and other animals. Agro-forestry also has the potential to help reduce climate change since trees take up and store carbon at a faster rate than crop plants.

### **6.35.3 Extension Forestry:**

Planting of trees on the sides of roads, canals and railways, along with planting on wastelands is known as 'extension' forestry. Extension forestry helps in increasing the boundaries of forests. Under this project, there has been creation of forests on the village common lands, government wastelands and panchayat lands.

Schemes for afforesting degraded government forests that are close to villages are being carried out all over the country.

#### **6.35.4 Community Forestry:**

Community forestry is a village-level forestry activity, decided on collectively and implemented on communal land, where local populations participate in the planning, establishing, managing and harvesting of forest crops, and so receive a major proportion of the socio-economic and ecological benefits from the forest.

Community forestry is a process of increasing the involvement of and reward for local people, of seeking balance between outside and community interests and of increasing local responsibility for the management of the forest resource. Also, like sustainable development, community forestry should be a learning experience for all involved parties.

#### **6.35.5 Silviculture or Scientific Forestry:**

Silviculture is the art and science of controlling the establishment, growth, composition, health, and quality of forests to meet diverse needs and values of the many landowners, societies and cultures over all the parts of the globe that are covered by dry land. Silviculture lays great stress on replacement and replanting of new crops and trees.

The objectives of silviculture are as follows:

1. Deriving environmental benefits, regulating afforestation, ensuring soil conservation
2. Raising species of more economic value and introduction of exotics
3. Production of plants of high quality timber species
4. Increasing production per unit area
5. Reduction of rotation period
6. Afforestation of blank areas
7. Creation of plantations
8. Increasing production of fuels and fodder quality
9. Increasing raw materials for forest based industries
10. Increasing employment potential

#### **6.36 Assessment of Social Forestry Programmes**

Social forestry was originally conceived by the government as a response to the forestry crisis and to the accelerating deforestation in India. The original objectives of social forestry projects were to assist rural communities and the landless people to meet their needs for fodder, fuel wood, small

timber, fruits, and minor forest produce through tree plantations planned and managed by the community.

Most social forestry projects, however, came under increasing criticism because they failed to adequately involve the local communities and the rural poor, the main beneficiaries. Instead, these projects catered mainly to urban and commercial interests through the widespread promotion of fast growing tree species for pulp and paper manufacture, rayon production, urban fuel wood supply and other commercial uses.

Private farmlands, wastelands and community lands were converted for these uses, and in a number of cases the access of the poorer rural population to fodder, fuel wood and other forest products actually reduced. The only benefit was the availability of seasonal employment to the rural people in tree planting operations, which actually reduced in net terms in the case of farm forestry.

On the management front, the main drawbacks included greater emphasis on silviculture, lack of the required extension work, involvement of people and Panchayati Raj Institutions, commensurate modifications in the forest regulations to motivate people to grow trees and that of orientation for the grass roots functionaries towards the needs of social forestry. Focus on economic benefits gave greater emphasis to fast growing species, which could not cater to the subsistence needs of the poor. Although eucalyptus trees grow more quickly, and remained at the focus of the projects, they could not provide the community with basic subsistence items.

A 1988 midterm review of social forestry cited the lack of the participation of local communities in project design and implementation and over reliance on industry biased management as the main causes of the shortcomings of the project.

### **The Social Forestry Programme**

In the social forestry programmes, emphasis on planting trees without appreciating the requirements of the communities impacted its sustainability negatively.

Planting of tree is still taken as a good option for degraded soils and wastelands instead of a diversification crop. Farm forestry became popular more for its long gestation period, for low labour requirement and absentee landlordism, rather than its remunerative aspects. Agro-forestry seems to be acceptable when a balance is struck between agriculture and the planting of tree. However, it works only for farmers with bigger holdings, because for marginal farmers and the landless, livelihood issues compel the use of land mainly for conventional agriculture.

Some aspects of agro- and farm forestry, namely private enterprises in tree planting, have suffered not only from the indifferent forest related regulations but also from the fiscal policies related to them.



The control on harvest and the movement of forest produce as provided in forest laws works as a disincentive for the farmer to grow trees. Permissions are required from the forest department for felling trees as well as transporting the forest produce in almost all the states of the country. Even where these regulations are relaxed, adequate evidence is required to prove (during transportation) that the produce has been collected from private lands and not government forests.

In the initial stage of agricultural development, expansion of agriculture took place at the expense of forests. These sectors competed for space in the private sector and plantation of trees lagged because of the lack of incentives, policy back up and the resultant economic considerations. The concessionary supply of the forest raw material from state governments and the relaxed conditions for the import of pulp have acted as additional disincentives for *growing of trees* because of the availability of cheaper raw material to industries. Thus, social forestry in its initial form was faced with the problems of low viability.

Today, the social forestry establishments within the state governments continue with the work of extension and awareness campaigns, afforestation on non-forest lands, urban forestry and the related activities. Community participation in social forestry is pursued through government interventions in the preservation of sacred groves, planting of institutional areas, other vacant lands and urban areas with resident associations, etc.

Though by law social forestry is a Panchayat subject, Panchayats have seldom played any active role in the process of afforestation in the case of common lands.

It is necessary that the establishment of social forestry operates in collaboration with Panchayati Raj Institutions, as these institutions have adequate allocation of resources for afforestation and the management of existing *tree lands* as common property resources.

### **6.37 Joint Forest Management: Concept and Objectives**

Degradation of forest resources resulting from more than a century of its overexploitation and increasing human and livestock pressures has been of great concern to the nation. The degradation of forests affects most the poor rural masses that depend on forest resources for livelihood. The management of the government forests till recent past was aimed at the production of goods and services like timber, other forest produce and maintenance of soil and water regime. Access of communities to these resources was limited to Rights and Concessions granted for pathways, dry wood for fuel wood to a limited extent and grass and fodder as regulated by the government. In some states, traditional rights for structural timber were also recognized and granted on a periodic basis.

Through the social forestry scheme, the government aimed at community participation, as part of a drive towards afforestation, and rehabilitation of the degraded common lands. A similar programme

has been identified for the rehabilitation and conservation of the government forests. Through Joint Forest Management, degraded government forests in the vicinity of villages are being revitalized by the collective efforts of the government and the villagers.

In 1988 the Government of India introduced a new forest policy that radically altered the aims of forest management, shifting it from a commercial and industrial focus to one that stresses environmental functions and meets the basic needs of the people living in or near the forests. For the first time, the rights of people living in and around the forests were recognized as a part of the management of forests, and the demand of the people has been recognized as the first charge on the forest produce.

In support of this new policy, in 1990 the Government of India issued a directive to the states to develop a participatory approach in their efforts to restore nation's degraded forests. This approach has been named Joint Forest Management and is also called Participatory Forest Management. So far 28 states have issued resolutions for Joint Forest Management. By 2003, 17.33 million ha of forestlands were being managed and protected by about 84600 village-level JFM Committees. The aim is to universalize JFM to involve all the 1.73 lakh villages in the vicinity of forests. Based on the experiences gained in the implementation of this programme since 1990, the Government of India modified the related guidelines in 2000 and 2002 and State Governments have been framing their respective rules within the framework of the said guidelines of the Government of India.

The National Afforestation and Eco-development Board (NAEB) was established in 1992 for promoting afforestation and ecological restoration activities in the country.

It is the successor of the erstwhile National Wasteland Development Board (NWDB) and is responsible for providing impetus to the rehabilitation of degraded forests in the states. Under the National Afforestation Programme, the Government of India assists the states in their afforestation efforts. Also, this programme is being used by the Government of India to expand and promote the Joint Forest Management in the states.

### **6.38 Design of the Programme**

Basically, Joint Forest Management empowers the communities to assess, plan and manage the forest resources, which constitute their main life support system. An adequate extent of Government forest area is earmarked for handing over to the village unit of communities for management. Villagers are organised as *Joint Forest Management Committees* (JFMCs) for this purpose. These committees are given various names like *Vana Samrakshana Samiti* (VSS), *Forest Protection Committee* (FPC), *Village Forest Committee* (VFC), etc. The State Forest Department organises and provides motivational, technical and administrative support to the JFMCs, which attract the

support of the villagers on the fringes of the degraded forests as its willing members. Generally, two people from each household become members, one of them a woman. The general body of 75 to 150 members, 50 per cent of whom are women, elect a JFM Executive Committee, which in turn elects a chairperson to oversee and manage the affairs of the JFMC. It is prescribed that at least 33% of the seats in the JFM Executive Committee be filled by women members. For a general body meeting, presence of at least 50% of the women members is taken as a prerequisite.

Adequate representation is ensured to all the sections of the society. The Forest Department representative acts as the secretary. Interested social and nongovernmental organisations are also involved in building up confidence among the communities.

A memorandum of understanding between the JFMC and the Forest Department formally details the duties, functions, and entitlements of everyone involved. The primary purpose of the JFMC is to protect the forest from encroachment, grazing, theft, fire and to improve the forest in accordance with an approved joint forest management plan, known as a micro-plan. Micro-plans are designed to ensure protection of forests and at the same time they aim at restoring their productive capacity as quickly as possible.

As an incentive for managing a particular forest, a JFMC is entitled for a share from the forest produce grown and available in the area. The income generated from the disposal of forest produce, after meeting the requirement of communities, is distributed equally among the members of the JFMC. At the outset, to help motivate people and to address some of their most pressing social needs, the State Forest Department provides some financial support for the development of the village(s) concerned. The project supports some of these “entry point” activities, with the assistance of other government departments or NGOs to facilitate this broader rural development activity.

This enables successful integration of conservation with development aims of the government. It is also prescribed that an appropriate percentage of the income generated from the forest resources be apportioned for activities that are important for ensuring sustainability of the forest(s) managed by the JFMC.

The works and funds of the JFMC are handled in a transparent manner jointly by the chairperson of the JFMC and the forester who acts as the secretary. This transparency helps to ensure the quality and cost-effectiveness of all activities. All the decisions related to the implementation of the micro-plan and appropriation of the funds accrued to the JFMC are taken collectively by the JFMC.

### **6.39 The Impact of Joint Forest Management**

The participatory management of forests enables the communities to understand the capability of the forests in catering to their need and thus prompts them to have a realistic resource management plan, based on their requirements and priorities, for the forests entrusted with them. The

empowerment of communities in planning and managing the common property resources in their vicinity evolves a sense of ownership of the forests and thus the responsibility of maintaining sustainability becomes a voluntary commitment. As all the villagers are involved in this process, unity and consensus for taking conscious decisions about collective (common property) resources along with wholehearted co-operation are evolved. These, as we know, are the crucial attributes for an ideal village society. Participatory management also ensures willing inputs from the communities in optimizing/maximizing the productivity of forests.

The process of micro planning enables the villagers to understand and appreciate the resource related issues and the importance efforts required for conservation of natural resources.

Most of the states have adopted the JFM concept for the management of degraded forests in the vicinity of villages. States like Madhya Pradesh have entrusted the management of forests within 5 kms of villages to the village communities, irrespective of the degradation status of such forests. Kerala too has adopted the JFM concept for the management of Non-wood Forest products/resources making it possible for the forest and fringe dwellers to take up activities for conserving the resources and appropriate the NWFP on the principles of sustainability. The Government of India has made JFM an integral part of the National Afforestation Scheme in which the Central Government provides funds for afforestation of degraded forests through Forest Development Agencies (FDAs), which are the consortia of JFM Committees with representation from Panchayats, Forest and other line Departments of the State Governments concerned.

#### **6.40 Participation of Communities in Conservation of Biodiversity Village Eco-development**

We have learnt about the forestry management models with participatory approaches adopted for the management of degraded forests for sustainable use, growing of trees as an economic activity and rehabilitation of private and community lands for community use. The typical JFM model is not applicable in situations where the villages are situated in the vicinity of protected areas, i.e. Sanctuaries and National Parks. Protected Areas or PAs, as these conservation area units of forest management are called, are basically the forest areas set apart for the preservation of biodiversity and representative or unique natural habitats in which human interference is sought to be avoided. These areas showcase the wildlife (uncultivated flora and undomesticated faunal diversity) of the country and the objective of management in this case is to preserve the gene pool by preserving the natural habitats. Forestry operations are avoided and so the removal of forest produce.

In India, at present an area of approximately 1.56 lakh square kms is covered and managed as 500 Sanctuaries and 89 National Parks. Human habitations are situated near these areas also and in many cases within the PAs and there are populations, especially tribal communities, which have lived there for ages. Relocation of human settlements out of the PAs has been one of the operational

components of the Protected Area Management, but it is resolved that such relocation should be absolutely voluntary (National Wild Life Action Plan, 2002). However, human interference in PAs is preferred to be avoided. In such cases, therefore, the village population is deprived of the life support system and perhaps the most important natural resource at its disposal. Besides, these communities face hardships due to loss of employment based on forestry operations, damage of crops and elimination of life by wild animals, etc. This often results in a conflicting situation between the objectives of management and the needs of the society, breaking the bond between the nature and the human inhabitants.

In these situations, instilling the realization of the positive impact of conservation in ecological and economical terms in the communities concerned would be possible by designing rural development programmes which could divert the livelihood pressures from the forests (in terms of their invasive use), and provide improved quality of life to the neighbourhood communities by positive ecological impact of the conserved PAs on the village ecosystem. This strategy is known as Village Eco-development.

### **Concept and Design**

Village Eco-development aims at the all-round development of the village as planned by the villagers themselves for sustainable use of all the resources available at their disposal. Dependence of villagers on the forests of a PA is diverted by creating livelihood opportunities outside the PA by optimizing the use of available resources, increasing productivity and value addition based rural enterprises. Non-invasive services generated in the PAs are made available to the deserving members of the community and they are empowered with knowledge and techniques in achieving the objectives of the management and protection of the PA. Children, for example, are involved in *nature education* and the *appreciation of natural phenomena*.

As in Joint Forest Management, Eco-development Committees (EDCs) are formed in villages and they work with NGOs and the PA managers for planning and implementing the appropriate eco-development plans for the village as well as conservation of biodiversity. Development of community resources and generation of gainful employment outside the PA, avoiding invasive and destructive use of PA habitats are the prime considerations in micro planning. Opportunities of seasonal and regular employment in the PA are made available to the villagers recommended by the EDC. Alternatives to the forest based employment are explored and pursued.

Modalities of regulating access to the resources (like water and biomass products) in conformity with the prescriptions of the management plan of the PA are also decided by the EDC.

The micro-plan thus prepared takes the shape of an integrated rural development plan that may require investment. There have been instances where such investments have been ensured by

various line departments on requests from the PA management, ensuring implementation of site-specific plans beyond the realm of conventional government schemes. In most of the cases so far, investment has been made under the government schemes for the management of PAs.

#### **6.41 Village Eco-development as a Government Programme**

Village eco-development was adopted as a government effort for the management of PAs during the Ninth Five Year Plan. A pilot project on *park management* based on participatory Village Eco-development was started during the plan period in seven Project Tiger Areas under the aegis of the Global Environment Facility (GEF) through the World Bank. The Project is in its final stage and has been slated to be one of the successful experiments in winning the co-operation of communities in the conservation of biodiversity. The final results are yet to be compiled in order to develop a universally applicable model of Eco-development Approach. Now the

Government of India has prescribed that the village eco-development activities be taken up as a regular *PA management* activity in all the wildlife park management schemes supported by the Central funds.

#### **6.42 Conclusion**

We have seen that the pressures of population, development and the resultant invasive use of forests caused degradation and depletion. At the local level the worst sufferers have been the rural people living in the vicinity of forests. Social Forestry Programmes designed for afforestation of forest areas as well as non-forest areas dealt mainly with biomass production for relieving the pressures of wood products from forests.

Popularity of these tree-planting programmes promoted in private, community and other degraded lands varied depending upon the requirement of user populations, demand situation of industries and policy and laws related interventions. Social forestry programme has been recognized as a programme for planting trees, wherein community participation could not be ensured satisfactorily. For rehabilitation of degraded forests in the vicinity of inhabited areas, people's institutions have been created to manage government forests in recognition of their first claim on the natural resources as provided in the National Forest Policy 1988.

The guidelines of the Government of India for this participatory approach, named the Joint Forest Management, issued in 1990 and improved in 2000 and 2002, provided for the transfer of the responsibility of managing these forests to the communities in terms of planning, management, protection and sharing of benefits. These Guidelines provide for adequate representation of women in decision-making and clarify that the institutions are independent of the

purview of Panchayati Raj Institutions for the management of State Forests. However, a clear definition of roles and responsibilities is needed for conflict resolution.

### **Questions:**

1. Define natural resources management? Write down the objectives and approaches of natural resource management?
2. What is drought prone areas programme (DPAP)? Write down the coverage physical performance and funding pattern?
3. Write down the draw back and basic objectives of a command areas programme?
4. Define desert development programme (DDP)? Write down the coverage cost norms physical performance and funding pattern of desert development programme?
5. What is integrated wasteland development programme? Write down the historical background/evolution of the programme?
6. What are the objectives and salient features of IWDP?
7. What is a watershed and components of watershed development? List out the major activities of a watershed project? How you will monitor the performance?
8. Define social forestry perspective? Write down the types of social forestry in India? How you will assess the social forestry programmes?
9. What do you mean by joint forest management? Write down its concept and objectives?
10. How you will design of the programme of joint forest management?

### **Suggested Readings**

- Katar Singh(2009), Rural Development: Principles, Policies and Management, SAGE Publications India Pvt. Ltd. Publication year: 2009.
- H. D. Foth & I. M. Turk, Fundamentals of Soil Science, Wiley Eastern.
- George Tsakiris, Manika Gupta, Nevil Quinn, Prashant K. Srivastava, Agricultural Water Management-Theories and Practices, Elsevier Science
- A. Ranga Reddy, Watershed Management for Sustainable Development-With Reference to Drought, Mittal Publications
- Tiwari Manish, Joint Forest Management and Rural Development, VDM Verlag

**CERTIFICATE COURSE IN RURAL MANAGEMENT**

**COURSE : RURAL MANAGEMENT**

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**UNIT 7 APPLICATION OF ICT FOR RURAL MANAGEMENT**

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**STRUCTURE**

**7.0 Objectives**

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## **Suggested Readings**

### **7.0 Objectives**

1. To analyse the role and scope of ICTs in rural development.
2. To suggest course of actions that should be taken so as to utilise ICTs in better way for rural development.
3. To study the ICT and its relevance to rural development.
4. To examine the current status of ICT in India
5. Highlight ICT applications in agriculture development.
6. Describe the role of ICT in creating livelihood opportunities in rural communities.

## **Application of ICT for Rural Management**

### **7.1 Introduction**

Rural areas and villages are among those areas that need information technology development. Information technology can have an important role in promoting the prosperity in economics, social, cultural, and political aspects of rural areas. Information and Communication Technology (ICT) is a well-known service sector in world which can be utilized by India in acquiring Top position as Indian minds have been appreciated since the beginning. In order to achieve the targeted GDP of India it is necessary to accelerate the rural development rendering the rural mob to become active participant in the course of development of India as a whole. There are several problems in rural areas and several policies combating around 600,000 villages for rural development. But still all the policies are not directly meeting the needs of rural people due to lack of information and awareness. . Information and Communication Technology (ICT) represents a broad and continually

evolving range of elements that further includes computer hardware and software, television, radio, mobile phones, personal computers, kiosks and policies that govern these media and devices.

Rural Development which is concerned with economic growth and social justice, improvement in the living standard of the rural people by providing adequate and quality social services and minimum basic needs becomes essential. The present strategy of rural development mainly focuses on poverty alleviation, better livelihood opportunities, provision of basic amenities and infrastructure facilities through innovative programmes of wage and self-employment. ICT is the new tool for rural development. Information and Communication Technology, if used properly can be of great advantage for the development at grass root levels. At the same time challenge remains with the administration to capture the minds of the rural masses, mostly illiterate, to make them adapt the new technology which is completely alien to them. There are various rural development schemes run by the government of India and also organizations are present to look after the implementations of these programmes.

## **7.2 Applications of ICTs for Rural Development**

15 Within the new, society empowering, cross-sectoral, place-based, integrated policy paradigm for rural development, of critical importance is the interaction taking place among the various actors, namely citizens / society, businesses and administrative units, both within a rural region and between the region and the outer world. ICTs can support a two-directional interaction among the main actors in rural societies.

The range and potential of ICTs applications that are serving these types of interaction in rural regions, but also add value to personal, business and rural regions' development perspectives are presented in the following, classified as to their contribution to the individual/societal, business and administrative level.

## **7.3 ICTs Applications at the Individual/Societal Level**

In this section are presented ICTs applications that can apply to the individual / societal level.

### **Provision of Community Services**

A number of ICTs applications can be identified that allow citizens of rural regions to enjoy access to those basic services that are necessary for the improvement of the quality of their life, decreasing thus inequality in access to services between rural and urban population.

E-Health services: distant, non-stop medical support of rural population is of importance, especially for the elderly or disabled groups, mainly due to the limited access of rural regions to sufficient health services. ICTs are offering a great potential in this respect and a great progress can be marked in the field of e-health applications. In-house video-phone equipment allows direct communication of rural citizens with properly equipped health centers, where they can send video information and receive care support from specialized staff. This staff can monitor citizens' health via ICTs equipment (e.g. a GIS and a CRM system keeping historical clinic information) and properly intervene in case of critical incidents. Portable devices (e.g. cell phones) can also be used, which enable population to be real-time monitored by specialized health centers. Moreover, e-health applications can also be used for both disease management and prevention.

### Types of interaction enabled by ICTs among the main actors in rural regions

To From	Individual/Citizen	Business	Administration
Individual Citizen	<i>C2C</i> <i>Citizen to Citizen</i> e.g. social networks, e-communities	<i>C2B</i> <i>Citizen to Business</i> Citizens as clients – access to marketplaces or businesses Citizens as employees	<i>C2G</i> <i>Citizen to Government</i> e-government (access of citizens to public services e.g. tax offices)
Business	<i>B2C</i> <i>Business to Citizen</i> e.g. e-marketing, e-commerce, e-banking	<i>B2B</i> <i>Business to Business</i> e.g. e-commerce, networking - virtual enterprise	<i>B2G</i> <i>Business to Government</i> (access of businesses to public services)
Administration	<i>G2C</i> <i>Government to Citizen</i> e-government – provision of public services	<i>G2B</i> <i>Government to Business</i> e-government	<i>G2G</i> <i>Government to Government</i> e-government <i>G2E</i>

			(e-governance2 – government to employee)
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E-Learning services based on ICTs: aim at reducing barriers to the access of rural population to education / training services. E-Learning applications are quite useful both at the educational level (school) and the community level. At the educational level they can provide an E-learning platform that supports the teacher's work (e.g. organize and upload pedagogical material, create an on-line library of the courses); the student's work (e.g. on-line access to the library; on-line clarifications and cooperation); the group work e.g. access to remote laboratories for experimental work. Moreover, they increase familiarization of young people and development of skills in ICTs. At the community level, each individual has the possibility to use on-line learning services (e-courses) offered by various providers (companies, universities, private and public institutions, etc.), developing thus new skills and competencies that lead to personal empowerment and increase of skills and knowledge of employees in rural regions, adding value to labour productivity and competitiveness.

E-Libraries: offering access of rural population to knowledge and information sources. Joining networks of libraries enables local population (students, professionals, etc.) to share a larger amount of knowledge resources. As an example, the municipal library of Trikala-Greece is one of the 30 selected libraries in Greece that joins the Greek National Network of Public Libraries, getting access to catalogues of all Greek public libraries, to special Web portals, but also to a "digital depository of books and periodicals" developed at the national level. Users of the municipal library can, by accessing an in-house helpdesk, view or order articles and books in a digital form.

E-Culture: ICTs applications are offering rural population access to museums, cultural events etc. These are interesting applications, especially for young people in remote rural regions, keeping them on-line with exceptional cultural assets and events all over the world. An interesting application of e-culture has, among others, taken place in the rural region of Kastelli-Crete, in the context of the EU project Rural Wings, addressed to students of primary or secondary school.

m- e-banking: improving access to financial services is vital for rural regions, especially the more remote ones. E-banking and m-banking applications can revolutionize the provision of formal

services of the banking sector, offering new cost-effective ways of delivering traditional services, with huge benefits for users.

**Social networking:** the development of ICTs has largely contributed to the increase of social interaction taking place between individual to individual, individual to group, group to individual and group to group communication. ICTs and the Internet can be characterized as highly e-inclusive technologies, allowing people to establish links with the rest of the community or other communities as well. E-Inclusion is of paramount importance for rural regions, especially for those which are geographically isolated, leading to the creation of social networks. Such networks are vital for the strengthening of social relationships among citizens of rural communities, but also can be considered as important platforms for information dissemination and increase of awareness on various issues of concern at the local level.

**Social learning – knowledge-sharing platforms:** the unlimited potential for interaction among various partners based on ICTs is marking the growing capacity of multiple-actor networks to develop and perform collective actions assuring both e-participatory potential and network-run (web-based) technical processes.

**Participatory decision making** is a promising option provided by ICTs and relates to the most sophisticated level of e-Government, characterized by “networked presence” Rural citizens, in such a context, are deliberatively involved in a two way open dialogue with governmental institutions, and express their views, visions, expectations etc., playing thus an active role in the decision-making process. Various examples of successful implementation of ICTs for participatory decision making are encountered e.g. smart cities. Trikala – Greece is an exceptional example of such a city, where a variety of ICTs applications for public involvement is established.

**Teleworking:** is an important application of ICTs and a promising one in the rural context. ICTs are key drivers, among others, for the greater flexibility of jobs in time and space. New, location- and time-independent working structures are now offering the potential for decentralization of work through various teleworking schemes. Teleworking, as a powerful tool for “breaking down barriers between people, places, roles and activities”, can benefit rural regions by rendering them attractive locations for the development of teleworking schemes e.g. televillages, with considerable consequences in terms of new job creation, based on the geographical dispersion of businesses; strong job growth in the service sector restructuring of socio-economic pattern of rural regions; production and consumption patterns; commercial and social interactions.

## **7.4 ICTs Applications at the Business Level**

In this section are presented the range and potential of ICTs applications that can apply to the business level.

### **E-Agriculture - Farm-specific ICTs applications**

In the 21<sup>st</sup> century, a new knowledge-based farming system is emerging that, based on farm-specific ICTs applications (e-Agriculture) can support the: profitability at the farm level; production of competitive, market-oriented, qualitative food products; decrease of environmental and climate change impacts; and energy efficiency. Knowledge and information are key requirements that enable farmers to deal with contemporary challenges, particularly as the new agricultural technologies become more “knowledge-intensive”.

Agriculture nowadays is an information-intensive sector, drawing upon an infinite number of sources of widely dispersed “locally contextualized knowledge” and a considerable body of research material. Moreover, it relies upon the continuous flow of information from local, regional and world markets. The rise of ICTs, with their wide variety of applications, holds a great promise for agricultural development in rural regions.

ICTs farm-specific applications can be roughly distinguished into: on-farm support services; management and decision making support services; and on-site support services, all delivering appropriate knowledge and information to farmers in rural regions. These are presented as follows:

*On-farm support services* refer to the provision of on-farm personalized information via mainly wireless communication. Remote rural farmers can get access to special agricultural support services by use of mobile and wireless networking technologies, integrated to the satellite broadband channel. By these means, farmers can get: access to on-farm support (consulting services) by directly linking to agriculturalists; and information on specific problems at the farm level. The end users (farmers) can be located in remote areas (e.g. farms or greenhouses) and, by using mobile devices, they are able to raise questions to agriculturalists; transmit digital information in real-time; and get immediate diagnostic feedback. Interaction can be either synchronous e.g. transmit digital photos of infected plants in real-time and wait for immediate diagnostic feedback; and asynchronous e.g. raise an issue, ask questions to agriculturalists or to other farmers, upload high resolution pictures relevant to the issue raised and gather knowledge on the issue at hand.

Moreover, the convergence of different technologies e.g. nano-biotechnology with ICTs, has created effective new technological products that are now available in the market, which claim to resolve various kinds of problems. Examples are nano-sensors embedded in the ground, which, combined with ICTs, can provide valuable information to farmers on the variations in soil quality, the water table and crops on a day-to-day basis.

*Management and decision-making support services* aiming at the enhancement of farmers' knowledge for management and decision-making purposes. As ICTs applications, serving this purpose, can be considered:

1. Precision farming: advanced e-Agriculture application, where ICTs, computers and satellite technologies are used to better manage farm resources (FAO, 2005), based on the identification, analysis and management of spatial and temporal variability of soil and plants (e.g. through digital field records) that are supporting efficiency and sustainability objectives (rational use of resources, such as water and fertilizers).
2. Access to information and knowledge systems: supports the acquisition of various kinds of farm-specific information, e.g. weather information for irrigation, seed options, information for field work purposes, but also information on commodity prices, developments in farm machinery, pesticides and chemicals etc. that aim at supporting decisions at the farm level and improve farm management. As various studies show, farmers involved in such processes migrate quickly to Web-based transactions.

On-site support services delivering knowledge and information to farmers. As such can be mentioned the following:

1. On-site training services by agriculturalists - e-Seminars - available either in real time or in recorded video. These provide useful knowledge on various themes of agricultural interest, e.g. new and improved ways of cultivation, sustainable production, management issues, advisory services on new technologies in farming, cost effective techniques, new and upcoming agricultural methods, and agricultural events.
2. E-Marketing – E-Commerce that allow farmers to directly access either traders or customers in order to: market and sell their products; identify targeted audience; collect and track client/customer information on preferences; provide on-line information on product updates at a minimum effort and cost; etc.

3. Access to E-Libraries that helps farmers to acquire specialized knowledge in respect to issues of interest, which enhance local knowledge in agricultural issues e.g. sustainable agricultural practices, organic farming, new production techniques, marketing approaches, agricultural policy framework.
4. Access to E-communities via which farmers and other professionals in rural regions can get access to professional networks, crossing geographical boundaries and exchanging information with other members of the community that contributes to the increase of their knowledge and experience or the pursuance of mutual interests (networking) and objectives within the e-community.

### **7.5 Food quality and safety**

The increasing concern of consumers as to the quality and safety aspects of food is reflected to their demand for improved traceability of food in the whole chain of production, processing and distribution (from "farm to plate" chain). Traceability is becoming a mainstream commercial requirement and will continue to be a key requirement for exporting agricultural production e.g. to EU and the USA, based on the introduction of the EU General Food Law and the US Bioterrorism Act 2002 that have made traceability a mandatory requirement for market access. Moreover, there is already considerable evidence that the demand for certified safe and traceable food will continue to rise also for domestic production and supply in many countries.

Data management, based on ICTs, is the core of the food traceability issue, relating to the capture, identification, processing and dissemination of relative information, in combination with satellite imaging and mapping to enable real-time tracking and geo-trace ability .

### **7.6 E-Business**

ICTs and their applications are offering a platform supporting businesses in rural regions, both in the agricultural and other sectors, towards the: re-engineering of their production, management and organization processes; support of direct on-line interaction with customers; search for new market opportunities etc., enhancing thus their competitive potential in the new economy. The most promising ICTs applications for rural regions in the business sector are:

1. E-Commerce: ICTs are offering rural businesses the potential to establish an on-line transaction space with their customers and/or other businesses (B2C and B2B interaction).



2. E-Marketing: rural businesses can, by means of ICTs, market their products by establishing direct links with their customers (firms or individuals), creating thus a dynamic and adaptive two-way communication, increasing their potential towards the identification and adjustment to customers' needs; permeating to new market segments, etc. (B2C and B2B interaction).
3. E-Training (life-long e-training): businesses can get access to distant training opportunities for their employees, which support the upgrading of their knowledge and skills at an affordable cost.
4. E-Marketplace: based on ICTs, rural regions can develop e-marketplaces as marketing and transaction platforms that are based on local enterprises/products. Such e-marketplaces can allocate virtual spaces to all local businesses, so that their products are marketed through the network, providing access to a much larger clientele and bypassing traditional trade networks that often manipulate market prices. Several interesting examples of such marketplaces are developed in rural regions, in Philipinnes, Agriwatch in India, but also in small urban settlements e.g. a B2C marketplace in Trikala-Greece.

### **7.8 New business opportunities**

ICTs, in their function to diffuse information irrespectively of time, place and volume/type, are “enabling technologies”, supporting new business opportunities. ICTs applications in this respect can:

1. At the firm level: support a new, more efficient, intra-organizational structure of firms in rural regions; provide access to operating support, etc.
2. At the market level: enable firms in rural regions (farmers, manufacturers, tourist firms, etc.) to reach new market segments by directly accessing their clients (firms and consumers); and enable business networking as a cost-effective approach for generating new business opportunities e.g. virtual organization based on network interaction. Such business network structures in rural areas can be formed either between farmers, sharing resources, distribution networks, risks, etc. or between farmers and other businesses e.g. in a food chain structure (“from field to table” business agri-food chain), aiming at the strengthening of the position of firms involved against the increasing competition and the more efficient use of available resources.

3. At the sectoral level: enable new business opportunities in various sectors e.g. tourism sector, manufacturing sector, service sector

## **7.9 ICTs Applications at the Administrative Level**

In the following are presented ICTs applications that can apply to the administrative level.

### **E-Governance**

ICTs applications are supporting the improvement of the production processes within governmental agencies, by transforming interaction patterns among employees (G2E interaction). As a result, cost-effective public services are produced, based on the more effective management of organizational resources (capital, human, materials and machinery).

### **E-Government**

ICTs applications can effectively support the interaction taking place between governmental agencies on the one hand and citizens, businesses or other bodies of government on the other. In such a context, they consist of a communication platform, along which interaction is taking place in one of the following forms:

1. A one way communication, in which governmental agencies are disseminating various types of information, e.g. regulatory services, public hearing schedules, issue briefs, notifications.
2. A two-way communication between governmental agencies and citizens, businesses or other governmental agencies. Such an interaction implies that individuals, businesses or other bodies can engage in a dialogue with a certain governmental agency, in which they can communicate problems, post comments, or requests to the agency.
3. Conducting of transactions such as lodging tax returns, applying for services etc.

Such a ICTs-enabled communication platform can provide and/or improve governmental services in rural areas by allowing on-line transactions through the development of one-stop E-Government portal (G2C, G2B and G2G interaction). Moreover, it increases efficiency and improves services of governmental agencies in rural regions, assures better accessibility of public to services and improves transparency in decision making and accountability. Many good examples of e-

Government can be encountered nowadays, with a prominent example from the Greek territory being the small city of Trikala, keeping one of the first twenty positions worldwide in this effort.

### **7.10 Barriers Appearing in the Adoption and Use of ICTs Applications in Rural Areas**

The following steps need generally to be undertaken in order to develop ICTs applications in rural areas:

*First step:* deployment of the necessary network infrastructure, referring to both hardware e.g. fiber optic or wireless public broadband networks, fixed wireless technology (WiFi, WiMax), mobile wireless (m-) reaching directly individual end-users, satellite networks (VSAT) for data transmission, local networks, hubs - terminals for public use (nodes providing access to network services), cable Interactive Digital Television (IDTV), Public Switched Telephone Network (PSTN), etc. (see Hammond and Paul, 2006); and software.

*Second step:* creation of the ICTs applications and content layer, involving all applications and digital services that are best suited to the needs of each specific rural region, together with the content needed for each application, e.g. establishment of e-Government platforms for the provision of services to the citizens or e-training applications, together with the necessary content layers serving these applications. Various sector-specific applications for rural regions can also be developed in this step (e.g. health-care, tourism, training, food industry, agricultural applications).

*Third step:* relates to the familiarization of the end-users with ICTs and their applications in order to become active members of digital affairs in the rural community. This step implies the:

- Familiarization of rural population with new technologies through training on the use of ICTs, that will motivate them to join the ‘trip’;
- Familiarization of businesses with new technologies and their potential for supporting new business opportunities; and
- Preparation of local authorities and administration as pioneers of the whole effort, in terms of both getting access to the proper equipment (hardware and software) and training public servants.

Based on the above steps, barriers appearing in the effort of rural and remote regions to “log-in” the information and knowledge society can be systematically identified

a) Barriers relating to the *deployment of network infrastructure*: ensuring accessibility of rural regions to network infrastructure is a critical issue in promoting ICTs applications in these regions. Barriers relating to the development of network infrastructure in rural regions are mainly associated with the:

- Costs involved in the deployment of this infrastructure, which, when combined with the lack of sufficient demand, render relative investments financially unsustainable (Hammond and Paul, 2006), e.g. in the case of remote, sparsely populated, rural areas.
- Diversity of ICTs applications that can serve the needs of rural regions and the respective network infrastructure requirements necessary for serving these applications e.g. e-platforms for community-specific ICTs applications vs m-platforms for personalized farm-specific ICTs applications.
- Lack of continuous and high speed network connections.

b) Barriers relating to the development of specific ICTs *applications and content* in rural regions such as:

- Lack of access of rural regions to proper equipment, both hardware and software, for the development of specific applications as well as costs involved in this respect;
- Lack of knowledge of the range of applications that could be of relevance for each rural region due to the lack of a regionally-focused and demand-driven approach to identify specific needs;
- Lack of skilled personnel to build and run such applications and content;
- Costs involved in content development, where different needs and preferences of different groups call for a region-specific user-oriented content development, with content developed for or adapted to the specific rural context;
- Lack of region-specific knowledge and respective needs of the various rural regions from those engaged to develop applications and content. This may result to a mismatch of applications and content developed in respect to the real needs of rural population;

- Barriers relating to the management of the digital content due to constraints in coherence and inter-operability of data and information sources, from which such information is gathered.

c) Barriers associated with the *adoption and use of technology* by the end-users in rural areas (citizens, businesses and administration), relating to:

- Lack of skilled human resources – limited capacity of human resources as users of ICTs;
- Lack of institutional capacity and capacity of people involved in the information provision in rural areas to ensure the right information in the right formats;
- Limited range of e-government services that use open IT standards, which introduces barriers to the end-users relating to the necessity to use commercial technology / software.
- Low level of entrepreneurship in rural regions;
- Low level of sector-specific applications in rural regions (health-care, tourism, food industry, environmental industries etc.) that impede ICTs adoption rates at the business level;
- Lack of training opportunities / structures that offer the chance to rural population to develop skills and competencies on ICTs and their applications, focused on their specific needs;
- Lack of knowledge on the potential offered by ICTs applications for personal (skill and competence acquirement) and business development (integration into supply networks, knowledge networks, potential for knowledge management);
- Inability to build various kind of local partnerships, which will ensure that information is accessible by all local stakeholders;
- Language skills that bound interaction potential of rural population / businesses and limit the benefits reaped out of this;
- Barriers due to culture and traditions of rural social systems, resulting to a reluctance to shift to a new, less controllable, regime, which impede social anchoring of ICTs in local rural communities. In locally-oriented rural economic systems, such kind of barriers may be

stronger, while in open, export-oriented rural economic systems, these may appear weaker;

- Lack of new technology culture, holding especially for the older age groups in rural regions that influence the propensity to adopt and use ICTs and their applications;
- Lack of trust to technology at the local society; and
- Costs involved in getting access to (PCs, mobiles etc.) and use of ICTs for businesses and citizens.

d) Barriers relating to missing or of limited capacity network infrastructure in respect to the type of applications / content that would serve the needs of rural areas. These are mainly due to:

- The lack of region-specific and demand-driven approach to network infrastructure and ICTs applications / content development that can lead to a mismatch of network infrastructure on the one hand and ICTs applications / content on the other; and
- The multiplicity of application-specific network requirements in rural areas e.g. e-platforms for community applications, m-platforms for farmers' personalized applications, satellite technology for farm management purposes.

e) Barriers relating to the *type of network infrastructure* selected for the support of e-applications in each specific rural region. Barriers involved in such a context refer to the:

- Type of network infrastructure technology adopted that should adjust well to local pattern of communication (Gouscos et al., 2001). Deployment of network infrastructure based on technologies that are not building upon already established communication means within each rural community can place barriers to rural population in joining the 'trip', due to lack of familiarity, trust, etc. (FAO, 2005).
- Close to the above issue is the tendency of deploying network infrastructure, which is focusing more on the technological aspects than the communication and networking potential this can create, i.e. there is a domination of a technology-led service provision approach, with no effort devoted on fostering demand (IIED, 2009). According to Ashton and Thorns (2004), decision making on network infrastructure development should focus more on the generation of good communication links, so that the local community can

develop a sense of a social entity, than on the technological attributes of this infrastructure.

- Lack of establishment of multi-device / multi-channel access, exploiting multiple and diverse communication tools that integrate the full range of existing media (Kastells, 2010) in rural regions, enhancing thus accessibility potential that can influence ‘log-in’ attitude/behavior of local population.
- Costs involved in using the network infrastructure.
- Costs involved in getting access to the necessary equipment to join the network.

f) Barriers relating to the type of applications and relating content that is proper for different types of end-users. Barriers appearing in this context relate to:

- The lack of a user-oriented knowledge development (content) and exchange strategy (medium) that can deliver a wide range of applications relevant to the needs of different end-users (citizens, businesses and administrative units). Matching ICTs applications / content to the specific needs of end-users is a key issue towards the ‘log-in’ perspective of these users.
- The lack of effective interaction among researchers as developers of ICTs applications and end-users in rural regions that will establish a demand-driven approach to the applications / content development process (SCAR Foresight, 2007).
- Lack of users’ involvement in the design of the various ICTs applications / content (co-design of applications) (Lind, et al. 2008).
- Lack of simplicity of applications. There is an increasing need for applications which, based on open software and peer-to-peer platforms, can provide low cost and easy to use solutions that fit local needs.
- Lack of a multimodal, multi-channel system of digital communication that integrates all media (Kastells, 2010). This will remove barriers appearing in matching applications offered through a certain technology to the technology disposed by the end-user.
- The over-focus of ICTs applications on technological aspects than the communication and networking potential they enable (Ashton and Thorns, 2004).

- Costs involved in the access (PCs, mobiles etc.) / use of the ICTs applications and content.

### 7.11 Policy Recommendations for Future Rural Development ICTs Policy

1. ICTs can contribute to many aspects of rural regions' development such as the improvement of agricultural production and productivity, the production of safer food, the support of businesses and entrepreneurship, the upgrading of skills and competencies of local labour, the strengthening of bonds in the local society, the social equity in 'logging-in' opportunities, the increase of public participation, the more effective and sustainable use of natural resources etc. In this respect, ICTs applications can be strategic tools for the development of rural regions, provided that they take into account the social contexts and offer tailored-made solutions to community needs.
2. Policy making needs to take into account the peculiarities of rural regions, by addressing more effort on the promotion of those network technologies that are best suited for rural regions and their transformation into products and services, effectively dealing with region-specific needs. 'Network readiness' is of crucial importance in this respect. Based on that, the deployment of case-specific ICTs applications and content for rural inhabitants will increase awareness and take-up of Information Society in rural regions, contributing to their future development (EC, 2003).
3. In order to motivate actors in rural regions to log-in the information society, certain policy directions are critical. Towards this end, policy recommendations for the future rural development ICTs policy may concern:
  - The development of *user-oriented knowledge and exchange strategies*, targeted to address current and emerging needs of rural regions in transition.
  - The development of *place-based applications* that are adapted to the lack of continuous and high speed connections in many rural areas around the world. Alternative mobile and wireless infrastructure and applications (in particular WLAN technologies, such as microwaves and 802.11 Protocol) can be useful in this respect, as well as applications adapted to TV set-top boxes (EC, 2003).
  - The development of *location-specific applications*, supporting the provision of personalized knowledge and information. In this respect, eGIS (Geographic Information Systems)



serving the identification of spatial entities and delivery of location-based services for rural development are important.

- The setting up of effective *communication infrastructure / processes* that are focusing more on the outcome they can create than on the technology itself. This is quite important for engaging local people in establishing communication links and contributing their ideas and skills (Ashton and Thorns, 2004). The scope of ICTs development, in this respect, should be the promotion of ICT4D, based on building local capacity, content and acceptance (IIED, 2009).
- A focus on building *e-communities*, by addressing research efforts on technologies that support community building and trust, with a particular emphasis on technologies enabling the building of human relationships, acting as a catalyst for knowledge and information diffusion.
- The development of a *multimodal, multi-channel system of digital communication* that integrates all media (Kastells, 2010) and adjusts better to the local communication pattern and the varying communication preferences of end-users.
- The development of proper *interfaces* for the take-up of ICTs applications. Challenges include: multilingual, multi-modal and adaptive interfaces, natural language interaction, visualization technologies, etc.
- The strengthening of the efforts devoted to the *upgrading of skills* of human resources as users of ICTs, by establishing proper life-long learning and training structures in rural regions as well as by facilitating knowledge exchange and mutual learning among communities with similar needs.
- Finally, of particular importance seems to be the *role of local administration* as leaders in establishing an ICTs culture in rural regions. A good example is, among others, the municipality of Trikala-Greece (among the first 20 smart cities in the world), where initiatives of the local administration have improved the: involvement of the public in setting the local agenda; and community participation in the decision making process, based on the provision of access to ICTs and the establishment of a new Government to Citizen (G2C) culture of interaction.

**Questions:**

1. Which are the Applications of ICTs for Rural Development? Which are the new business opportunities?
2. List out the barriers appearing in the adoption and use of ICTs applications in rural areas?
3. What are the policy recommendations for future rural development ICTs policy?

**Suggested Readings**

- Katar Singh (2009), Rural Development: Principles, Policies and Management, SAGE Publications India Pvt. Ltd. Publication year: 2009.
- H. D. Foth & I. M. Turk, Fundamentals of Soil Science, Wiley Eastern.
- R. Saravanan, (1 January 2011), Information and Communication Technology for Agriculture and Rural Development, New India Publishing Agency

**CERTIFICATE COURSE IN RURAL MANAGEMENT**

**COURSE: RURAL MANAGEMENT**

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**UNIT 8: APPLICATION OF REMOTE SENSING AND GIS IN RURAL  
DEVELOPMENT: NATURAL RESOURCE MANAGEMENT, WATERSHED  
MANAGEMENT**

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**STRUCTURE**

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### **8.11.1 Integrated Approach**

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### **Questions**

### **Suggested Readings**

## **8.0 Objectives**

1. Natural Resources Management System is an integrated natural resource management system of India which aggregates the data about natural resources from the remote sensing satellites and other conventional techniques.
2. Identification of appropriate corrective GIS and Remote Sensing application in rural area.
3. To identify components of watershed management.
4. To examine the watershed management approaches.

## **Application of Remote Sensing and GIS in Rural Development: Natural Resource Management**

### **8.1 Introduction to Remote Sensing in Rural Development**

Digital agriculture or precision agriculture (PA), concepts that are often used interchangeably, represent the use of large data sources in conjunction with advanced crop and environmental analytical tools to help farmers adopt the right management practices at the right rates, times and places, with the goal of achieving both economic and environmental targets. In recent years, there has been growing interest in PA globally as a promising step towards meeting an unprecedented

demand to produce more food and energy of higher qualities in a more sustainable manner by optimizing externalities.

Remote sensing (RS) is one of the PA technologies that allows growers to collect, visualize, and evaluate crop and soil health conditions at various stages of production in a convenient and cost-effective manner. It can serve as an early indicator to detect potential problems, and provide opportunities to address these problems in a timely fashion. Application of RS technologies in agriculture started with the first launch of the Landsat Multispectral Scanner System (MSS) satellite in 1972.

Various RS platforms are currently used, including handheld, aircraft and satellite, which can be used to collect data at different spatial, temporal, and spectral resolutions. The most appropriate resolutions required for PA depend on multiple factors, including management objectives, crops and their growth stages, the size of a field, and the ability of a farm machinery to vary inputs (fertilizer, pesticides, irrigation). For instance, ability to detect crop emergence is highly dependent on higher spatial resolution data (<0.1 m) that can help differentiate crop characteristics (i.e., leaves, area) at a stand level than that required for crop yield estimation (1–3 m) multispectral imagery helps assess crop health patterns that visible (VIS) imagery cannot detect and thermal imagery is useful for detecting pest pressure soil moisture and crop water stress that the naked eye cannot detect. Unlike visible and infrared (IR)-based RS, microwaves are less prone to atmospheric attenuation and can help determine the biophysical properties of crops and soil under any day and night conditions. (e.g., country or continent). The overarching goal of this study is to complement previous efforts by providing a comprehensive review on the use of RS technologies in different aspects of production agriculture, ranging from field preparation to seeding to in-season crop health monitoring to harvest.

Historically, rural development started as agrarian revolutions to the complex socio-political issues of traditional farming throughout the world. However, in the modern set-up, it is very difficult to define the term 'rural development' as it has moved too much from its basic meaning as 'development of rural areas' to 'integrated rural development', to the present form of 'sustainable rural development'. Now, there are three key terms, i.e., rural, development and planning. The term 'rural' is broadly referred to the area(s) whereby people are usually engaged in 'farm activities' or production of foods, fibres, ores and raw materials. The term 'development' is a process of gradual growth or advancement through progressive changes. Development has been described as a generic term meaning growth, evolution, stage of inducement or progress. The development concept is very much dynamic as it has been taking different shapes and dimensions since the beginning of civilization. The present nature of development is totally different from the nature of development

during 1950s. It is a process of improving the well-being of the rural people by raising the standard of living, improving their education and health and also opening the equal opportunities for a richer and more varied life. Development process is complex and multi-faceted. The components of the process primarily include the socio- economic, politico- administrative and cultural dimensions which constantly interplay with the total development process. The term 'planning' is something more than the articulation of goals and formulation of a strategy. It stands for coordinated use of all available resources-material and non-material for realizing certain predetermined or preferred and gradually evolving goals through creation or adaptation of an institutional framework that can support sustenance to developmental efforts. Therefore, the goals and parameters should be operationally defined and identified properly so that they could easily be realized for action – oriented procedures. In the light of the above definitions, Rural Development may be outlined as process facilitation through policy changes and strategic interventions in rural areas to help the rural community for their gradual socio-cultural, political and economic advancement. It may be defined as a process leading to sustainable improvement in the quality of life of rural people, especially the poor. However, it is to be noted that every definition has its own meaning and can be interpreted in a variety of ways. But, the dominating factor of these definitions speaks for the holistic development of rural areas and rural people in terms of positive and constructive changes in their cultural, social, spiritual, ethical, political and economic conditions. The objectives of rural development encompass improved productivity, increased employment and higher incomes as well as minimum acceptable levels of food, clothing, shelter, education and health for the people. Rural development, therefore, can be described as a process aiming at improving the well-being of people living outside the urbanized areas. It is not merely the agricultural development but transformation of entire rural systems. Therefore, rural development has to be viewed in its totality rather than fragmented approach. Agriculture being the most important and major component of the rural system, the emphasis has to be laid on this aspect only to identify some important issues in rural development programmes.

**8.2 Concept of Spatial Database (SD):** A database is an organized collection of logically related data designed to meet the information needs of one or more users. It tends to be long term resource of an organization that could be used for planned as well as unplanned applications without great difficulty. The term 'Spatial' is originated from 'spatium' which means space. It refers to something very much linked with geographic space, i.e., a particular location in terms of latitude and longitude. When the two terms 'spatial' and 'data' are combined, it forms 'Spatial Data' that may be defined as observations made from real world comprising of entities marked by geographic coordinate system or become geo-framed under a particular projection system. Spatial database is one of the

important components of GIS. It is based on the fundamental key concept that every object on the earth surface can be geo-tagged in the GIS environment. It may be defined as the collection of information about spatial or geographical entities and their relationship with each other. According to ESRI (Environmental Space research Institute) among the three components of GIS, database is first one then map and model component. GIS itself is a unique kind of database of the World. Fundamentally, GIS based structured database describes the real world in geographic terms acting as an infrastructure or say 'Spatial Data Infrastructure' (SDI) coined in 1993 by US National Research Council which helps to assess resources and strategic planning. The Spatial database allows a range of functions for storing, processing, analyzing, and visualizing real world data. Data are organized in database tables. A table is an important part of database in which data elements are organized using a model of horizontal rows and vertical columns. The column are known as fields or attributes identified by name and other numerical information. The rows are called as records or tuples that indicate the values appearing in a column subset. Spatial database possess two interlinking components, i.e., Location (latitude and longitude) and Attributes (characteristics). SD forms the foundation of planned human activities. Management of natural resources, infrastructure development and planning, land use planning etc. are just a few example of area in which decision making is contingent on availability of accurate and high quality of spatial data. Recent advancement in geospatial technology especially in remote sensing and GIS has added more values in mapping and analysis of geographical facts with quite precision. Development of spatial database (SD) is the recent advancement in the field of GI Sciences that support to solve the various complex problems of human being including development and planning. The creation of SD requires digital database obtained from remote sensing and others sources including field investigation after encoding different geographical data-sets. The emphasis was given to generate digital database in all Government organizations at different levels and data sharing to form a master database. Most of the states in India and several Ministries and Departments of Central and State Governments have initiated for geo-database creation through special GIS programme relating to ground water studies, cadastral mapping, power transmission and transportation infrastructure. As the demand of integrated data sources for socio-economic and spatial planning is increasing, the institutional infrastructures have been developed across the country catering local, regional and national needs. Some of the institutions with sophisticated capabilities are National Remote Sensing Centre (NRSC) Hyderabad, Indian Institute of Remote Sensing (IIRS), Dehradun; Space Application Centre (SAC), Ahmadabad; Central Arid Zone Research Institute (CAZRI), Jodhpur; Regional Remote Sensing Application Centre (RRSAC) at Bangalore, Nagpur, Jodhpur, Institute of Remote Sensing at Anna University, Chennai and SOI Training Institute, Hyderabad. These institutes offer

a variety of training programmes relating to remote sensing and GIS besides undertaking or supporting large scale application projects. Apart from these organizations, various Universities, IITs and private institutions also support to popularize RS and GIS by offering certificate, P.G. diploma /Degree courses. Some of important projects are worth to mention such as launching of spatial database for ground water through internet on world water day by P.K. Bansal, Union Ministry for Water Resources, e-kiosk for farmers query on ground water information, epanchayet . The Jharkhand Space Research Application Centres launched a live GIS for water resource measures likewise, hi-ambitious projects regarding development of digital database for land resources have been started in Maharashtra, Tamil Nadu, Uttar Pradesh, Himachal Pradesh, Orissa, Karnataka etc. National Land Records Modernization Programme (NLRMP) has been conceptualised as a major initiative for the generation of SD. It is concerned not merely with computerization, updating and maintenance of land records and validation of titles, but also as a programme that will add value and provide a comprehensive database for development planning and disaster management, location-specific information and citizen services. Under the National Land Record Modernization Programme (NLRMP), the three layers of data are integrated on a Geographic Information System (GIS) platform viz. spatial data from satellite imagery/aerial photographs, Survey of India and Forest Survey of India maps, and Revenue records with detailed cadastral maps. All cadastral maps will be digitized and data would be included with plot numbers and unique id for each land parcel. The Programme will be of immense use for both Central and State Governments – who can utilize these information for modernizing and bringing efficiency to the land revenue administration. It can also support as a comprehensive tool for planning land-based development and disaster management by providing location-specific information. Even the private sector will be able to benefit from this comprehensive tool for planning business and economic activities.

### **8.3 Introduction to GIS in Rural Development**

Geographic Information Technology has developed at a remarkable pace over the past two decades and will play a key role in development of nations in the 21st Century, thereupon many countries have already prepared their strategic development plans for application of GIS Technology with gigantic financing endeavours. Now time has come for all decision makers to discuss the appropriateness of GIS technology and its applications to rural development, forest management, urban development planning, land information systems and agricultural development. This will also provide a suitable solution for the use of GIS for educational infrastructure development with special emphasis on rural sector in India.



Educationists, planners, researchers, decision makers, administrators, communication professionals and officials from different departments and some reputed NGOs should be invited to discuss the role of GIS Technology and should implement the same outcome immediately for ensuring sustainable development and socio-economic and educational uplifting of the country.

Information Technology has emerged as an inevitable phenomenon influencing every walk of life of people in all sections of this society. With the ease of availability of enormous computing power and convenient access to large volume and variety of data and information, the structure and functions of all human organisations will undergo profound transformation in this century. Nations are engaged in exploiting this phenomenon for many of their socio-economic requirements. One area, which is engaging serious attention, relates to use of Information Technology in the governance systems, especially the tools and techniques for acquisition and management of data relating to Geographic Information System (GIS).

#### **8.4 GIS in India**

India maintains a pre-eminent position in the use of spatial imagery. The capabilities in the development of high-resolution satellites and extensive network of associated infrastructure have contributed to the growing interest in the application of GIS for a variety of India's development needs. Indications are that these applications will continue to grow even more rapidly in the coming years. Since the spatial imagery is becoming easier to use and more affordable, the user base for GIS is expanding in several directions in seeking holistic solutions beyond image processing capabilities.

The Information Technology policy of Government of India adopted in 1999 emphasizes the availability of spatial data to GIS user community and industry, thereby enabling the widespread development of Spatial Decision- Support Information System Network including Web enabled GIS application services. The Indian export from GIS segment is expected to increase to US \$ 150 million in the next five years from the present level of US \$ 60 million. The areas which are receiving priority attention include natural resources information assessment, monitoring and management, water shed development, environmental planning, urban services and land use planning.

Most States in India and several ministries and departments of the Central and State Governments have initiated special GIS programmes relating to ground water studies, cadastral mapping, and power transmission and transportation infrastructure. The integration of socio-economic data with

spatial data is increasing. The institutional infrastructures have been developed across the country catering to the local, regional and national needs. Some of the institutions with sophisticated capabilities are: National Remote Sensing Agency, Hyderabad, Indian Institute of Remote Sensing, Dehradun, Space Application Centre, Ahmedabad, Regional Remote Sensing Service Centres at Bangalore, Nagpur, Jodhpur, Institute of Remote Sensing at Anna University, Chennai and Survey of India Training Institute, Hyderabad. These institutions offer a variety of training programmes relating to GIS besides undertaking or supporting large scale application projects.

At present a large number of private firms of Indian and foreign origin have been active in undertaking GIS projects. They have been particularly responsible in introducing in the country instruments, softwares and educational programmes. Central Mining Research Institute (CMRI), one of the premier laboratories of Council of Scientific and Industrial Research (CSIR) is fully equipped with latest IT related infrastructure and their Scientists are capable for undertaking any GIS related projects of India and abroad. NIC is also providing assistance to several Central, State and Local bodies in fulfilling their specific GIS requirements. In recent years most of the organisations engaged in GIS activities have felt the need for establishing control points especially in applications such as land records management, cadastral survey and hydrographic survey. For these tasks, acquisition of Global Positioning System (GPS) has been increasing. During the year July 2000-June 2001 about 50 GPS equipments have been procured by several governmental agencies in the country. Despite these noteworthy achievements in GIS in India, there are still some limiting factors that need to be addressed, such as the restrictions on the availability of high-resolution data in sensitive areas, lack of nationwide control points, absence of more convenient repository and retrieval systems and lack of standardization of map scales.

The implementation of GIS in Research Programme raised a variety of conceptual questions for both the ecological and the socio-economic sectors of this regional, integrated research programme. In addition to these basic units of research, spatial links between the two sectors and levels of data abstraction for the spatial database had to be defined. Using the theoretical background of the hierarchical system approach and valuable experiences of spatial data handling a consistent spatial information database can be created. Despite problems with data accuracy, logical consistency and completeness of data, a powerful tool for regional and local planning can be developed which can serve as a framework for a variety of planning purposes at the local and regional levels, as well as the transfer of know-how between governmental agencies and institutions using an interactive approach.

Agriculture plays a vital role in every nation economy. It represents a substantial trading industry for an economically strong country. Production of food in a cost-effective manner is the essential goal of every farmer, large-scale farm manager and regional agricultural agency. Remote sensing and Geographic information system used to analyse and visualize agricultural environments has proved to be very beneficial to farming community as well as industry. It plays great role in agriculture throughout the world by helping farmers in increasing production, reducing costs and managing their land more efficiently. Geographic information systems (GIS) has been widely applied and been recognized as effective and powerful tool in detecting land cover and land use change. Using remote sensing and GIS are important to understand the health of crop, extent of infestation, potential yield and soil conditions. It applied to explore agricultural applications such as crop identification, area estimation, crop condition assessment, soil moisture estimation, yield estimation, agriculture water management, agro meteorological etc.

Applications of remote sensing in agriculture including major important things such as; biomass and yield estimation, vegetation vigor and drought stress monitoring, assessment of crop phenological development, crop acreage estimation and cropland mapping, mapping of disturbances and land use land cover changes in addition to precision agriculture and irrigation management. GIS based mapping application can help to identify location of crops growing across the country and to adapt different variables, monitor the health of individual crops, estimate yields from a given field, and maximize crop production. By using land-use and primary food crop statistics, along with data collected by different tools including mobile devices able to identify areas in need and underlying causes of food insecurity, GIS is an instrumental in the efforts to end global hunger and it is an integral part of automated field operations.

Using data collected from remote sensors, and from sensors mounted directly on farm machinery, farmers have improved decision-making capabilities for planning their cultivation to maximize yields. Previous crop yields, terrain specifics, organic matter content, pH, moisture, and nutrient levels of the soil all aid in proper preparation for precise farming. Combine harvesters equipped with GPS tracking units can measure crop yields along with crop quality values like plant water content and chlorophyll levels in real time and at the exact location in the field from which they are harvested. Rapidly emerging remote sensing and geospatial technology can play vital role for crop growth monitoring, identification and management of different types of stresses, regional yield estimations, to sustain the natural resources and agricultural productivity.

## **8.5 GIS and Remote Sensing application in Rural Area**

### **8.5.1 Crop inventory**

Remote sensing (RS) and Geographical Information System (GIS) play a crucial role for identification of crops and areas where changes in cropping patterns and useful tool to carry out crop surveys and mapping. Reliable and timely information on types of crops grown, their area and expected yield is importance for government for agriculturally based country. The spectral information is the important aspect of remote sensing data for crop modeling and it is strongly related with canopy parameters which are the representative of crop health and crop growth stages. Crop-specific maps created by combining satellite image, survey data and provide the layout of the land and owners (farmers) which are helpful to agribusinesses such as seed and fertilizer companies. The science of remote sensing can play a significant role in inventorying data base on different crops. Several studies using aerial photographs and digital image processing techniques have been reported in literature. It helps in reducing the amount of the field data to be collected and provides higher precision of the estimate.

### **8.5.2 Analysis of Crop Yield, Damaged Crop Region and Forecasting**

Moisture stress and flood is a common occurrence in rain fed areas to damage crops, particularly rice growing regions. Different information on crop yield is an important input for production estimation. Every crop genotype has certain yield potential, which can be achieved in experimental field with optimal conditions. However, in the real world, the crop yield is conditioned by various parameters like soil, weather and cultivation practices, like date of sowing, irrigation and fertilizer. Crop yield is also influenced by biotic stresses like disease and pest. Satellite based remote sensing provides a suitable alternative for crop condition and yield assessment/forecasting, as it gives a timely, accurate, synoptic and objective estimation of various crop parameters. Remote sensing data has one of an important tool for yield modelling.

The crop vigour is an indication of crop yield. It can be assessed using vegetation indices derived from different parts of the field. Plant growth simulation models have been used for monitoring crop growth, health and predicting yield. However, their use in large areas has been limited because most plant growth models were developed at the field scales. Synthetic Aperture Radar technology integrated with crop modelling approach to estimate and forecast yield. Crop health condition and identification can be detected with remote sensing data by estimating the loss of leaf area. The symptoms of pest attacks usually cause the break-down of chlorophyll, and one can identify the reduction of chlorophyll concentration in the plants through remote sensing.

### **8.5.3 Nutrient and Water Stress**

Plants require water, sunlight and adequate nutrients for proper growth and vitality. In plant cell and tissue development macronutrients acquired in greater amount than micronutrient as fundamental substances. One of the most important fields where we can opt for application of remote sensing and GIS through the application of precision farming is nutrient and water stress management. Detecting nutrient stresses using remote sensing and GIS are important in site specific nutrient management and thereby can reduce the cost of cultivation as well as increase the fertilizer use efficiency. In the arid regions, judicious use of water can be possible through adaptation of precision technologies. For example, drip irrigation coupled with information from remotely sensed data such canopy temperature difference can be used to increase the water use efficiency by reducing the runoff and percolation losses.

By using multispectral and hyper spectral image nutrient deficiency is detected. Spectral reflectance measurements can help to select wavelengths sensitive to different types of nutrient and water stress. Detection of crop water stress is important for efficient irrigation water management. Vegetation water stress by using satellite monitoring is important for precision agriculture, timing of irrigation to ensure crops will not grieve from water stress and produce yield under limited water conditions. Satellite data has potential to provide spatial and temporal dynamics of crop growth conditions under water stress and its impact over productivity.

### **8.5.4 Flood Monitoring**

Remote sensing technology allows measurements particularly from space to be obtained over spatial scales much larger than may be covered by field-based instruments and methods. Satellite data of inundation have been used to gather information about flooding across different temporal and spatial scales, especially in the form of flooded area. Automated spacecraft technology has reduced the time to detect and react to flood events in a few hours. using satellite image of floods are important to demonstrate the potential and to improve our understanding of flood processes and even speculated on the value. It is possible to increase the spatial coverage of river discharge estimations globally by using remote sensing approach; several surface water hydraulic characteristics of large rivers can be measured or evaluated from remote-sensing data, which include average river width over certain reach length, water surface slope, water surface elevation and channel morphology.

Hydrological data assimilation and modelling through river flow measurements are important in flood forecasting and other water resource management issues. Observations of river, precipitation

and surface topography into early warning systems by employing satellite microwave sensors to gauge discharge from rivers by measuring changes in river widths and satellite-based estimates of rainfall to improve warning systems. Optimization methods were also used to minimize discrepancies between simulations and observations of flood extent fields to estimate river discharge. By using remotely sensing information, estimation of spatial variability in evapo-transpiration is possible over a wide area coupled with surface energy balance algorithms. The energy emitted from cropped area temperature of most plant leaves are mediated by soil water and crop evapo-transpiration.

### **8.5.5 Land Use and Land Cover**

Land use/ land cover mapping involves identifying surface features at various scales and their hierarchical classification and it play a major role in the study of global change. Human activity causes environmental problems resulted in deforestation, biodiversity loss, global warming largely affects land use/land cover. Therefore, critical input for decision-making of environmental management and planning the future can be provided by available data on land use /land cover. Growing population and increasing socio-economic results unplanned and uncontrolled changes in land use/land cover. The land use/land cover alterations are generally caused by mismanagement of agricultural, range and forest lands which lead to severe environmental problems such as floods, landslides etc. Pixel by pixel change detection comparison technique was applied to the Land use\land cover maps derived from satellite imagery. Surface features existing naturally (forests, hills, rivers, etc.) are termed as land cover whereas features modified by human beings are classified as land use (urban, rural settlement, canal, orchards, etc.). Land use and land cover mapping has always remained very important in all geographical studies as it composed of basic information of feature existing on surface along with their information on area, location, shape and pattern.

Digital detection is the processes that are essential to identify variation associated with land use and land cover properties throughout geo-registered multi temporal remote sensing data. Remote sensing and GIS have extensively used in preparing land use and land cover information of an area. So, it is better than manual surveys of extensive regions in terms of cost, accuracy and manual errors. In addition imagery or aerial photographs capture synoptic view of an area; hence nothing can be remained unobserved while in surveys there are ample chances of negligence of some features, satellite imaginaries can be acquired at some interval while surveys can't be conducted regularly or over a short period monitoring of surface features or phenomena (floods, deforestations, forest fires, etc.) become easy and cost effective, different geographical, socio-economic aspects can be analyzed by incorporation of one information with other. Digital detection is the changes

related with land use and land cover properties with reference to geo-registered multi temporal remote sensing data. Remotely sensed data and field observations collaboration can accomplish land cover classification, change detection, faster and cheaper than either alone.

#### **8.5.6 Agro Metrological Application**

Agriculture highly influenced by climatic and metrological phenomena. The metrological data are collected by different spatial network of point station observation. Conventional agro-metrological techniques have severe limitation to use their data for real time agricultural monitoring and yield forecasting. Satellite metrology has allowed obtaining accurate and frequent measurements of several basic agro metrological parameters (example surface temperature, evapotranspiration, solar radiation, rain fall). The agro meteorology inputs were predominantly significant rainfall at fortnightly intervals, minimum and maximum temperatures etc. that would form part of correlation weighted regression model.

Geostationary satellites remote-sensing of weather and climate is regarded as the single most significant breakthrough for monitoring the Earth's vegetation, weather and climate in the last quarter of a century, these satellites collect data on ocean temperature and terrestrial vegetation. Information on meteorology and vegetation are the two major important inputs into agricultural meteorology. Two broad meteorological satellite types are in common use. One is the Geosynchronous Meteorological Satellite (GMS), which orbit at an altitude of some 36 000km and the second is polar orbiting satellite which placed on a low Earth orbit of 750km.

#### **8.5.7 Pest Infestation**

Applications of remote sensing technologies are important and effective method to identify pest-infested, diseased and detecting, mapping, monitor Invaders. Spatial heterogeneity complicates the trends of biological invasion study; however, with its broad view remote sensing has the potential to deliver the relevant information. Remote sensing applications provide data has important for detecting and mapping defoliation, characterize pattern disturbances and etc. The remote sensing application in monitoring and assessing insect defoliation has been used to relate variation in spectral responses to chlorosis, yellowing of leaves and foliage reduction over a given time period if these differences can be correlated, classified and interpreted.

Airborne remote sensing with different flight altitudes can achieve different spatial resolutions. Ground-based platforms are typically used in pest management, crop disease, detection of insect damage to crops along with weed infestation and provides valuable information for management

planning and decision making. Colour infrared aerial photography with conventional camera have been used effectively to delineate damage caused by several serious pests.

### **8.5.8 Water Resource Management**

In the recent decades, the scarcity of water resources is being experienced at global and regional level and, therefore, needs to be managed judiciously by applying the state-of-the-art technologies. Remote sensing is one of the effective tools for assessing and monitoring the water resources. Hyper spectral remote sensing is emerging as the more in-depth means of investigating spatial, spectral and temporal variations in order to derive more accurate estimates of information required for water resource applications. The advent of microwave remote sensing has made possible the assessment of soil moisture availability from remote sensing data. One of the most valuable natural resources is groundwater, which supports human health, ecological diversity and economic development. Overexploitation of this vital resource is threatening our ecosystems and the life of future generations.

The applications of Geographic information system (GIS) and remote sensing (RS) technologies in groundwater hydrology have received cursor treatment. A good understanding of the geographical space and related spatial information like water sources, watershed, terrain surface, land use, land cover, rainfall, temperature, humidity, soil condition and composition, geology, conditions on the atmosphere, human activities, environmental data, etc. are important for water management. Geographic information system (GIS) and remote sensing (RS) technologies also describes the problems, significance, and sustainable management of groundwater and freshwater. The integration of geographic information system and remote sensing techniques has enabled assessments of aquatic vegetation growth, salt marsh quality and floodplain disturbances over time and provided careful consideration is given to source materials and database construction.

## **Watershed Management**

### **8.6 Introduction**

**Watershed management** is the study of the relevant characteristics of a watershed aimed at the sustainable distribution of its resources and the process of creating and implementing plans, programs and projects to sustain and enhance watershed functions that affect the plant, animal, and human communities within the watershed boundary. Features of a watershed that agencies seek to manage to include water supply, water quality, drainage, storm water runoff, water rights and the overall planning and utilization of watersheds. Landowners, land use agencies, storm water



management experts, environmental specialists, water use surveyors and communities all play an integral part in watershed management.

Hundreds of millions of poor and marginal farmers rely on degraded land and water resources and struggle to cope with a diverse array of agro-climatic, production and market risks. The rate of land degradation in rain fed areas in India is more. Basically on account of soil erosion from run-off. Water is needed to grow the food to adequately feed the future generations. How to produce more and better food and maintain or improve critical ecosystem services without further undermining our environment is a major challenge.

Watershed is defined as a geohydrological unit draining to a common point by a system of drains. All lands on earth are part of one watershed or other. Watershed is thus the land and water area, which contributes runoff to a common point.

### **8.7 History of Watershed Development Program in India**

About 60 per cent of total arable land (142 million ha) in India is rain-fed, characterized by low productivity, low income, low employment with high incidence of poverty and a bulk of fragile and marginal land. Rainfall pattern in these areas are highly variable both in terms of total amount and its distribution, which lead to moisture stress during critical stages of crop production and makes agriculture production vulnerable to pre and post production risk. Watershed development projects in the country has been sponsored and implemented by Government of India from early 1970s onwards. The journey through the evolution of watershed approach evolved in India. Various watershed development programs like Drought Prone Area Program (DPAP), Desert Development Program (DDP), River Valley Project (RVP), and National Watershed Development Project for Rain-fed Areas (NWDPA) and Integrated Wasteland Development Program (IWDP) was launched subsequently in various hydro-ecological regions, those were consistently being affected by water stress and draught like situations. Entire watershed development program was primarily focused on structural-driven compartmental approach of soil conservation and rainwater harvesting during 1980s and before. In spite of putting efforts for maintaining soil conservation practices (example, contour bunding, pits excavations etc.), farmers used to plow out these practices from their fields. It was felt that a straightjacket top-down approach cannot make desired impact in watersheds and mix up of individual and community based interventions are essential.

The integrated watershed development program with participatory approach was emphasized during mid-1980s and in early 1990s. This approach had focused on raising crop productivity and livelihood improvement in watersheds along with soil and water conservation measures. The Government of India appointed a committee in 1994 under the chairmanship of Prof. CH

Hanumantha Rao. The committee thoroughly reviewed existing strategies of watershed program and strongly felt a need for moving away from the conventional approach of the government department to the bureaucratic planning without involving local communities. The new guideline was recommended in year 1995, which emphasized on collective action and community participation, including participation of primary stakeholders through community-based organizations, non-governmental organizations and *Panchayati Raj* Institutions.

Watershed development guidelines were again revised in year 2001 (called Hariyali guidelines) to make further simplification and involvement of PRIs more meaningful in planning, implementation and evaluation and community empowerment and guidelines were issued in year 2003. Subsequently, Neeranchal Committee (in year 2005) evaluated the entire government-sponsored, NGO and donor implemented watershed development programs in India and suggested a shift in focus “away from a purely engineering and structural focus to a deeper concern with livelihood issues”. Major objectives of the watershed management program are: 1) conservation, up-gradation and utilization of natural endowments such as land, water, plant, animal and human resources in a harmonious and integrated manner with low-cost, simple, effective and replicable technology; 2) generation of massive employment; 3) reduction of inequalities between irrigated and rain-fed areas and poverty alleviation.

### **8.8 Definition of Watershed**

A watershed, also called a drainage basin or catchment area, is defined as an area in which all water flowing into it goes to a common outlet. People and livestock are the integral part of watershed and their activities affect the productive status of watersheds and vice versa. From the hydrological point of view, the different phases of hydrological cycle in a watershed are dependent on the various natural features and human activities. Watershed is not simply the hydrological unit but also socio-political-ecological entity which plays crucial role in determining food, social, and economical security and provides life support services to rural people.

### **8.9 Delineation of Watershed**

Hydrologically, watershed is an area from which the runoff flows to a common point on the drainage system. Every stream, tributary, or river has an associated watershed, and small watersheds aggregate together to become larger watersheds.

Water travels from headwater to the downward location and meets with similar strength of stream, and then it forms one order higher stream. The stream order is a measure of the degree of stream branching within a watershed.

Each length of stream is indicated by its order (for example, 1st-order, second-order, etc.). The start or headwaters of a stream, with no other streams flowing into it, is called the 1st-order stream. First-order streams flow together to form a second-order stream. Second-order streams flow into a third-order stream and so on. Stream order describes the relative location of the reach in the watershed.

Identifying stream order is useful to understand amount of water availability in reach and its quality; and also used as criteria to divide larger watershed into smaller unit. Moreover, criteria for selecting watershed size also depend on the objectives of the development and terrain slope. A large watershed can be managed in plain valley areas or where forest or pasture development is the main objective. In hilly areas or where intensive agriculture development is planned, the size of watershed relatively preferred is small.

## **8.10 Components of Watershed Management**

### **8.10.1 Entry Point Activity (EPA)**

Entry Point Activity is the first formal project intervention which is undertaken after the transect walk, selection and finalization of the watershed. It is highly recommended to use knowledge-based entry point activity to build the rapport with the community. Direct cash-based EPA must be avoided as such activities give a wrong signal to the community at the beginning for various interventions. Details of the knowledge-based EPA to build rapport with the community ensuring tangible economic benefits to the community members are described here.

### **8.10.2 Land and Water Conservation Practices**

Soil and water conservation practices are the primary step of watershed management program. Conservation practices can be divided into two main categories: 1) *in-situ* and 2) *ex-situ* management. Land and water conservation practices, those made within agricultural fields like construction of contour bunds, graded bunds, field bunds, terraces building, broad bed and furrow practice and other soil-moisture conservation practices, are known as in-situ management. These practices protect land degradation, improve soil health, and increase soil-moisture availability and groundwater recharge. Moreover, construction of check dam, farm pond, gully control structures,

pits excavation across the stream channel is known as *ex-situ* management. *Ex-situ* watershed management practices reduce peak discharge in order to reclaim gully formation and harvest substantial amount of runoff, which increases groundwater recharge and irrigation potential in watersheds.

### **8.10.3 Integrated Pest and Nutrient Management**

Water only cannot increase crop productivity to its potential level without other interventions. A balanced nutrient diet along with adequate moisture availability and pest and disease free environment can turn agricultural production several folds higher compared to unmanaged land. Integrated nutrient management (INM) involves the integral use of organic manure, crop straw, and other plant and tree biomass material along with little application of chemical fertilizer (both macro and micro-nutrients). Integrated pest management (IPM) involves use of different crop pest control practices like cultural, biological and chemical methods in a combined and compatible way to suppress pest infestations. Thus, the main goals of INM and IPM is to maintain soil fertility, manage pest and the environment so as to balance Costs, benefits, public health, and environmental quality.

### **8.10.4 Crop Diversification and Intensification**

The crop diversification refers to bringing about a desirable change in the existing cropping patterns towards a more balanced cropping system to reduce the risk of crop failure; and crop intensification is the increasing cropping intensity and production to meet the ever increasing demand for food in a given landscape.

Watershed management puts emphasis on crop diversification and intensification through the use of advanced technologies, especially good variety of seeds, balanced fertilizer application and by providing supplemental irrigation.

### **8.10.5 Use of Multiple Resources**

Farmers those solely dependent on agriculture, hold high uncertainty and risk of failure due to various extreme events, pest and disease attack, and market shocks.

Therefore, integration of agriculture (on-farm) and non-agriculture (off-farm) activities is required at various scales for generating consistent source of income and support for their livelihood. For example, agriculture, livestock production and dairy farming, together can make more resilient and sustainable system compared to adopting agriculture practice alone. Product or by-product of one system could be utilized for other and vice-versa. In this example, biomass production (crop straw) after crop harvesting could be utilized for livestock feeding and manure obtained from livestock could be applied in field to maintain soil fertility. It includes horticulture plantation, aquaculture, and animal husbandry at indivisible farm, household or community scale.

### **8.10.6 Capacity Building**

Watershed development requires multiple interventions that jointly enhance the resource base and livelihoods of the rural people. This requires capacity building of all the stakeholders from farmer to policy makers. Capacity building is a process to strengthen the abilities of people to make effective and efficient use of resources in order to achieve their own goals on a sustained basis. Unawareness and ignorance of the stakeholders about the objectives, approaches, and activities are the reasons that affect the performance of the watersheds.

Capacity building program focuses on construction of low cost soil and water conservation methods, production and use of bio-fertilizers and bio-pesticides, income generating activities, livestock based activities, waste land development, market linkage for primary stakeholders. Clear understanding of strategic planning, monitoring and evaluation mechanism and other expertise in field of science and management is essential for government officials and policy makers. The stakeholders should be aware about the importance of various activities, their benefits in terms of economics, social and environmental factors. Therefore, organizing various training at different scales is important for watershed development.

## **8.11 Watershed Management Approaches**

### **8.11.1 Integrated Approach**

This approach suggest the integration of technologies within the natural boundaries of a drainage area for optimum development of land, water, and plant resources to meet the basic needs of people and animals in a sustainable manner. This approach aims to improve the standard of living of common people by increasing his earning capacity by offering all facilities required for optimum production. In order to achieve its objective, integrated watershed management suggests to adopt land and water conservation practices, water harvesting in ponds and recharging of groundwater for increasing water resources potential and stress on crop diversification, use of improved variety of seeds, integrated nutrient management and integrated pest management practices, etc.

### **8.11.2 Consortium Approach**

Consortium approach emphasizes on collective action and community participation including of primary stakeholders, government and non-government organizations, and other institutions. Watershed management requires multidisciplinary skills and competencies. Easy access and timely advice to farmers are important drivers for the observed impressive impacts in the watershed. These lead to enhance awareness of the farmers and their ability to consult with the right people when problems arise. It requires multidisciplinary proficiency in field of engineering, agronomy, forestry, horticulture, animal husbandry, entomology, social science, economics and marketing. It is not

always possible to get all the required support and skills-set in one organization. Thus, consortium approach brings together the expertise of different areas to expand the effectiveness of the various watershed initiatives and interventions.

**Questions:**

1. What do you mean by remote sensing and GIS in rural development? Write down the applications of GIS and remote sensing in rural area?
2. What do you mean by watershed management? List out the history of watershed development program in India?
3. What are the Components of Watershed Management? Write down the approaches of watershed management?

**Suggested Readings**

- Katar Singh (2009), Rural Development: Principles, Policies and Management, SAGE Publications India Pvt. Ltd. Publication year: 2009.
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**CERTIFICATE COURSE IN RURAL MANAGEMENT**

**COURSE: RURAL MANAGEMENT**

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**UNIT 9: RURAL INFRASTRUCTURE MANAGEMENT, DISASTER MANAGEMENT**

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## **STRUCTURE**

### **9.0 Objectives**

### **9.1 Introduction (Rural Infrastructure Management)**

### **9.2 The government of India has initiated critical schemes for the upliftment of rural infrastructure**

#### **9.2.1 Pradhan Mantri Awas Yojana (PMAY - Gramin)**

#### **9.2.2 Pradhan Mantri Gram Sadak Yojana (PMGSY)**

#### **9.2.3 Jal Jeevan Mission (JJM)**

### **9.3 Reforms that are identified as imperative in the development of rural infrastructure**

### **9.4 Introduction (Disaster Management)**

### **9.5 Institutional and Policy Framework**

### **9.6 Disaster Prevention and Mitigation**

#### **Questions**

#### **Suggested Readings**

### **9.0 Objectives**

1. To improve productivity and wages of rural people.

2. To study the reforms that is identified as imperative in the development of rural infrastructure.
3. To identify institutional and policy framework of disaster management.
4. To examine the disaster prevention and mitigation.
5. To examine the increase in standard of living of the underprivileged population.

## **Rural Infrastructure Management**

### **9.1 Introduction**

India is a very vast country having 28 numbers of States and 8 Union Territories. It has a total population of over 1.4 billion. It is a fact that connectivity is not only a key component of Rural Development by providing access to economic & social services and thereby generating increased incomes and productive employment opportunities in India, it is also an ingredient in ensuring any sustainable Poverty Reduction Program. But one of the critical problems the country is experiencing even today after almost 60 years of Independence is that, there are as many as 40 percent habitations (3.30 lakh out of a total number of 8.25 lakh habitations) which still do not have all weather roads and there are some habitations which are not having any connectivity. Another aspect which needs to be indicated here is that, even where connectivity have been provided, the roads constructed are of such quality (due to poor maintenance) that they cannot be categorized as all-weather roads for all practical purposes. Due to poor and no accessibility to many remote pockets/habitations, development is taking place at a very slow space.

With a view to redressing the situation, government of India under the Ministry of Rural Development (MORD) have launched the Pradhan Mantri Gram Sadak Yajona (PMGSY) on 25th December 2000. This PMGSY is a 100 percent Centrally Assisted Scheme & 50 percent of the Cess on High Speed Diesel (HSD) is earmarked for this Program. This Program as indicated above has been in operation since 2000 and will continue till the end of tenth plan period, that is 2007 with a view to extend all weather connectivity to all the habitations in the entire country.

Infrastructure plays a critical role in the economic development of any country. Presently 65% of India's population resides in its rural areas. Therefore, rural infrastructure needs to be developed to provide basic amenities such as civic services and housing to the rural population. This will help boost their quality of life. Growth of rural infrastructure is important from the perspective of agriculture, agro-based industries, poverty alleviation and better access to markets and job opportunities in rural regions. Keeping all the above factors in mind:



## **9.2 The government of India has initiated critical schemes for the upliftment of rural infrastructure:**

### **9.2.1 Pradhan Mantri Awas Yojana (PMAY - Gramin): Providing Housing for All by 2022.**

PMAY-G aims to provide pucca (permanent) houses and other basic civic amenities such as piped drinking water, power supply and Liquefied Petroleum Gas (LPG) connection in convergence.

### **9.2.2 Pradhan Mantri Gram Sadak Yojana (PMGSY): Improving rural connectivity, by providing all-weather roads to connect eligible habitations in rural areas. As on December 31, 2019, road length worth Rs. 2.9 lakh crore had been sanctioned and expenditure of Rs. 2.17 lakh crore incurred.**

### **9.2.3 Jal Jeevan Mission (JJM): Providing Functional Household Tap Connection (FHTC) to every rural household i.e., Har Ghar Nal Se Jal by 2024.**

There have been several factors that have posed a challenge to development in the past:

1. **Land availability:** There is a continuous tussle for land for agriculture, agro-based industries, and housing in the rural areas, which is a severe constraint to meet the housing demands of the rural population. This implies that the vision of 'Housing for All' will require acquisition/ supply of large land parcels on a regular basis.
2. **Inadequate financing:** Inadequate access to formal sources of finance for the rural population has been an issue in the rural housing sector. Lack of proper documentation/ steady source of income for rural population have been a hindrance in securing formal finance.
3. **Legal constraints:** There is a barrier for major players in real estate in tapping the vast land potential in rural areas reinforced by poor enforcement of laws against encroachment of public lands. There is an absence of clear titles to private lands causing an artificial scarcity of land in rural areas. Another major issue is the absence of large-scale digitisation of land records and easy access to such records for checking land-holding titles.
4. **Poor condition of rural road network:** India has one of the largest and densest rural road networks around the world. However, 2.7 million kilometres of rural road network is in poor condition. At present, most of the rural roads are not all-weather roads and lack connectivity to remote areas.

The provision of certain civil services such as water supply and sanitation has also been restricted due to several constraints:

1. **Limited accountability and lack of institutional capacity:** The Gram Panchayats (GPs) lack institutional strength and capacity and are not properly supported by the state

governments in developing, undertaking, and implementing infrastructure projects at the rural level.

2. **Lack of funds for improving rural infrastructure in India:** Improving the quality of life and services to the urban population has been given a higher priority over improving the provision and coverage of basic civic services in the rural areas.
3. **Low project viability due to limited paying capacity of the rural population:** The rural population lacks capacity to pay required user charges/ fees for availing quality civic services such as piped water supply, sanitation, etc. This also results in the local authorities not being able to even recover their administrative and O & M costs required to provide these services.

Vision for 2025 is for 100 per cent of the rural population to have access to pucca houses with basic civic amenities such as piped drinking water, power supply and LPG connections. For there to be the provision of urban facilities in rural areas under the **Rurban Mission**. There should be good quality and well-maintained rural roads facilitating improved connectivity, safer and efficient access to livelihood and socio-economic opportunities for rural communities. Under Jal Jeevan Mission, 100 per cent of rural households to have functional household tap connections by 2024 and 100 per cent of the rural habitations to have full access to safe drinking water. All rural households to have access to toilets (Individual Household Latrines) and for 100% of villages to be Open Defecation Free (ODF).

**9.3 Reforms that are identified as imperative in the development of rural infrastructure** are as follows:

1. **Boosting rural affordable housing to ensure ‘Housing for All by 2022’:** However, for the affordable housing initiative to succeed there needs to be efficient land usage and easy access to finance and innovative financing mechanism. For that the government is setting up an affordable housing fund in the National Housing Bank (NHB) that can be funded from the priority sector lending shortfall.
2. **Improving condition of roads under PMGSY:** All roads to be covered by five-year maintenance contracts, to be entered into along with the construction contract with the same contractor in accordance with standard bidding document (SBD). Policy Framework for road maintenance by National Rural Infrastructure Development Agency in collaboration with the International Labour Organization (ILO) to be implemented on a state level. Ensuring greater fund availability, acknowledging feedback from the Meri Sadak App and Improving last-mile connectivity in rural areas.

3. **Improving coverage of basic civic amenities:** By increasing accountability of GPs by decentralising service delivery model, improving the capacity of local government to undertake and implement quality infrastructure projects in the rural areas. And creating awareness among the rural population regarding user charges/fees for quality services/amenities.
4. **Improving supply of drinking water:** By bringing structural changes in the regulatory environment, a shift is needed in the institutional framework of the Central Water Commission (CWC) and the Central Groundwater Board (CGWB) to make water management more holistic and multidisciplinary. Restructuring and unifying the CWC and CGWB to form a new National Water Commission (NWC). A model law on water resource regulatory mechanisms can also be drafted and implemented on state level.

Centre and state government have over all estimated a total capital expenditure of Rs. 7,73,915 crore between fiscals 2020 and 2025 on rural infrastructure development. Department of Drinking Water and Sanitation will be implementing the Jal Jeevan Mission to provide functional household tap connection to every rural household i.e., “Har Ghar Nal se Jal” by 2024. The program will be implemented at an estimated total capex of Rs. 3,60,000 crore shared between states and centre as follows: Rs. 2,48,626 crore would be invested in rural housing under PMAY Gramin and about Rs 162,329 crore would be invested to improve rural roads under PMGSY.

## **Disaster Management**

### **9.4 Introduction**

1. India has been traditionally vulnerable to natural disasters on account of its unique geo-climatic conditions. Floods, droughts, cyclones, earthquakes and landslides have been a recurrent phenomena. About 60% of the landmass is prone to earthquakes of various intensities; over 40 million hectares is prone to floods; about 8% of the total area is prone to cyclones and 68% of the area is susceptible to drought. In the decade 1990-2000, an average of about 4344 people lost their lives and about 30 million people were affected by disasters every year. The loss in terms of private, community and public assets has been astronomical.
2. At the global level, there has been considerable concern over natural disasters. Even as substantial scientific and material progress is made, the loss of lives and property due to disasters has not decreased. In fact, the human toll and economic losses have mounted. It was in this background that the United Nations General Assembly, in 1989, declared the

decade 1990-2000 as the International Decade for Natural Disaster Reduction with the objective to reduce loss of lives and property and restrict socio-economic damage through concerted international action, especially in developing countries.

3. The super cyclone in Orissa in October, 1999 and the Bhuj earthquake in Gujarat in January, 2001 underscored the need to adopt a multi-dimensional endeavour involving diverse scientific, engineering, financial and social processes; the need to adopt multi-disciplinary and multi sectoral approach and incorporation of risk reduction in the developmental plans and strategies.
4. Over the past couple of years, the Government of India have brought about a paradigm shift in the approach to disaster management. The new approach proceeds from the conviction that development cannot be sustainable unless disaster mitigation is built into the development process. Another corner stone of the approach is that mitigation has to be multi-disciplinary spanning across all sectors of development. The new policy also emanates from the belief that investments in mitigation are much more cost effective than expenditure on relief and rehabilitation.
5. Disaster management occupies an important place in this country's policy framework as it is the poor and the under-privileged who are worst affected on account of calamities/disasters.
6. The steps being taken by the Government emanate from the approach outlined above. The approach has been translated into a National Disaster Framework [a roadmap] covering institutional mechanisms, disaster prevention strategy, early warning system, disaster mitigation, preparedness and response and human resource development. The expected inputs, areas of intervention and agencies to be involved at the National, State and district levels have been identified and listed in the roadmap. This roadmap has been shared with all the State Governments and Union Territory Administrations. Ministries and Departments of Government of India, and the State Governments/UT Administrations have been advised to develop their respective roadmaps taking the national roadmap as a broad guideline. There is, therefore, now a common strategy underpinning the action being taken by all the participating organisations/stakeholders.

## **9.5 Institutional and Policy Framework**

1. The institutional and policy mechanisms for carrying out response, relief and rehabilitation have been well-established since Independence. These mechanisms have proved to be robust and effective insofar as response, relief and rehabilitation are concerned.

2. At the national level, the Ministry of Home Affairs is the nodal Ministry for all matters concerning disaster management. The Central Relief Commissioner (CRC) in the Ministry of Home Affairs is the nodal officer to coordinate relief operations for natural disasters. The CRC receives information relating to forecasting/warning of a natural calamity from India Meteorological Department (IMD) or from Central Water Commission of Ministry of Water Resources on a continuing basis. The Ministries/Departments/Organizations concerned with the primary and secondary functions relating to the management of disasters include: India Meteorological Department, Central Water Commission, Ministry of Home Affairs, Ministry of Defence, Ministry of Finance, Ministry of Rural Development, Ministry of Urban Development, Department of Communications, Ministry of Health, Ministry of Water Resources, Ministry of Petroleum, and Department of Agriculture & Cooperation. Ministry of Power, Department of Civil Supplies, Ministry of Railways, Ministry of Information and Broadcasting, Planning Commission, Cabinet Secretariat, Department of Surface Transport, Ministry of Social Justice, Department of Women and Child Development, Ministry of Environment and Forest, Department of Food. Each Ministry/Department/Organization nominate their nodal officer to the Crisis Management Group chaired by Central Relief Commissioner. The nodal officer is responsible for preparing sectoral Action Plan/Emergency Support Function Plan for managing disasters.
3. **National Crisis Management Committee (NCMC):** Cabinet Secretary, who is the highest executive officer, heads the NCMC. Secretaries of all the concerned Ministries /Departments as well as organizations are the members of the Committee. The NCMC gives direction to the Crisis Management Group as deemed necessary. The Secretary, Ministry of Home Affairs is responsible for ensuring that all developments are brought to the notice of the NCMC promptly. The NCMC can give directions to any Ministry/Department/Organization for specific action needed for meeting the crisis situation.
4. **Crisis Management Group:** The Central Relief Commissioner in the Ministry of Home Affairs is the Chairman of the CMG, consisting of senior officers (called nodal officers) from various concerned Ministries. The CMG's functions are to review every year contingency plans formulated by various Ministries/Departments/Organizations in their respective sectors, measures required for dealing with a natural disasters, coordinate the activities of the Central Ministries and the State Governments in relation to disaster preparedness and relief and to obtain information from the nodal officers on measures relating to above. The CMG, in the event of a natural disaster, meets frequently to review

the relief operations and extend all possible assistance required by the affected States to overcome the situation effectively. The Resident Commissioner of the affected State is also associated with such meetings.

5. **Control Room (Emergency Operation Room):** An Emergency Operations Center (Control Room) exists in the nodal Ministry of Home Affairs, which functions round the clock, to assist the Central Relief Commissioner in the discharge of his duties. The activities of the Control Room include collection and transmission of information concerning natural calamity and relief, keeping close contact with governments of the affected States, interaction with other Central Ministries/Departments/Organizations in connection with relief, maintaining records containing all relevant information relating to action points and contact points in Central Ministries etc., keeping up-to-date details of all concerned officers at the Central and State levels.
6. **Contingency Action Plan:** A National Contingency Action Plan (CAP) for dealing with contingencies arising in the wake of natural disasters has been formulated by the Government of India and it had been periodically updated. It facilitates the launching of relief operations without delay. The CAP identifies the initiatives required to be taken by various Central Ministries/Departments in the wake of natural calamities, sets down the procedure and determines the focal points in the administrative machinery.
7. **State Relief Manuals:** Each State Government has relief manuals/codes which identify that role of each officer in the State for managing the natural disasters. These are reviewed and updated periodically based on the experience of managing the disasters and the need of the State.
8. **Funding mechanisms:** The policy and the funding mechanism for provision of relief assistance to those affected by natural calamities is clearly laid down. These are reviewed by the Finance Commission appointed by the Government of India every five years. The Finance Commission makes recommendation regarding the division of tax and non-tax revenues between the Central and the State Governments and also regarding policy for provision of relief assistance and their share of expenditure thereon. A Calamity Relief Fund (CRF) has been set up in each State as per the recommendations of the Eleventh Finance Commission. The size of the Calamity Relief Fund has been fixed by the Finance Commission after taking into account the expenditure on relief and rehabilitation over the past 10 years. The Government of India contributes 75% of the corpus of the Calamity Relief Fund in each State. 25% is contributed to by the State. Relief assistance to those affected by natural calamities is granted from the CRF. Overall norms for relief assistance

are laid down by a national committee with representatives of States as members. Different States can have State specific norms to be recommended by State level committee under the Chief Secretary. Where the calamity is of such proportion that the funds available in the CRF will not be sufficient for provision of relief, the State seeks assistance from the National Calamity Contingency Fund (NCCF) - a fund created at the Central Government level. When such requests are received, the requirements are assessed by a team from the Central Government and thereafter the assessed requirements are cleared by a High Level Committee chaired by the Deputy Prime Minister. In brief, the institutional arrangements for response and relief are well established and have proved to be robust and effective.

9. In the federal set up of India, the basic responsibility for undertaking rescue, relief and rehabilitation measures in the event of a disaster is that of the State Government concerned. At the State level, response, relief and rehabilitation are handled by Departments of Relief & Rehabilitation. The State Crisis Management Committee set up under the Chairmanship of Chief Secretary who is the highest executive functionary in the State. All the concerned Departments and organisations of the State and Central Government Departments located in the State are represented in this Committee. This Committee reviews the action taken for response and relief and gives guidelines/directions as necessary. A control room is established under the Relief Commissioner. The control room is in constant touch with the climate monitoring/forecasting agencies and monitors the action being taken by various agencies in performing their responsibilities. The district level is the key level for disaster management and relief activities. The Collector/Dy. Commissioner is the chief administrator in the district. He is the focal point in the preparation of district plans and in directing, supervising and monitoring calamities for relief. A District Level Coordination and Relief Committee is constituted and is headed by the Collector as Chairman with participation of all other related government and non-governmental agencies and departments in addition to the elected representatives. The Collector is required to maintain close liaison with the district and the State Governments as well as the nearest units of Armed Forces/Central police organisations and other relevant Central Government organisations like Ministries of Communications, Water Resources, Drinking Water, and Surface Transport, who could supplement the efforts of the district administration in the rescue and relief operations. The efforts of the Government and non-governmental organisations for response and relief and coordinated by the Collector/Dy. Commissioner. The District Magistrate/Collector and Coordination Committee under him reviews preparedness measures prior to a impending hazard and coordinate response when the

hazard strikes. As all the Departments of the State Government and district level report to the Collector, there is an effective coordination mechanism ensuring holistic response.

10. New institutional mechanisms: As has been made clear above, the existing mechanisms had based on post-disaster relief and rehabilitation and they have proved to be robust and effective mechanisms in addressing these requirements. The changed policy/approach, however, mandates a priority to full disaster aspects of mitigation, prevention and preparedness and new institutional and policy mechanisms are being put in place to address the policy change.
11. It is proposed to constitute a National Emergency Management Authority at the National level. The High Powered Committee on Disaster Management which was set up in August, 1999 and submitted its Report in October, 2001, had inter- alia recommended that a separate Department of Disaster Management be set up in the Government of India. It was, however, felt that conventional Ministries/Departments have the drawback of not being flexible enough especially in terms of the sanction procedures. The organisation at the Apex level will have to be multi-disciplinary with experts covering a large number of branches. The National Emergency Management Authority has, therefore, been proposed as a combined Secretariat/Directorate structure – a structure which will be an integral part of the Government and, therefore, will work with the full authority of the Government while, at the same time, retaining the flexibility of a field organisation. The National Emergency Management Authority will be headed by an officer of the rank of Secretary/Special Secretary to the Government in the Ministry of Home Affairs with Special Secretaries/Additional Secretaries from the Ministries/Departments of Health, Water Resources, Environment & Forests, Agriculture, Railways, Atomic Energy, Defence, Chemicals, Science & Technology, Telecommunications, Urban Employment and Poverty Alleviation, Rural Development and India Meteorological Department as Members of the Authority. The Authority would meet as often as required and review the status of warning systems, mitigation measures and disaster preparedness. When a disaster strikes, the Authority will coordinate disaster management activities. The Authority will be responsible for:-
  - a) Coordinating/mandating Government's policies for disaster reduction/mitigation.
  - b) Ensuring adequate preparedness at all levels in order to meet disasters.
  - c) Coordinating response to a disaster when it strikes.
  - d) Coordination of post disaster relief and rehabilitation.



The National Emergency Management Authority will have a core permanent secretariat with three divisions – one for Disaster Prevention, Mitigation & Rehabilitation, the other for Preparedness and the third for Human Resource Development.

12. At the State level, as indicated in Para disaster management was being handled by the Departments of Relief & Rehabilitation. As the name suggests, the focus was almost entirely on post-calamity relief. The Government of India is working with the State Governments to convert the Departments of Relief & Rehabilitation into Departments of Disaster Management with an enhanced area of responsibility to include mitigation and preparedness apart from their present responsibilities of relief and rehabilitation. The changeover has already happened in eight State Governments/Union Territory Administrations. The change is under process in other States.
13. The States have also been asked to set up Disaster Management Authorities under the Chief Minister with Ministers of relevant Departments [Water Resources, Agriculture, Drinking Water Supply, Environment & Forests, Urban Development, Home, Rural Development etc.] as members. The objective of setting up an Authority is to ensure that mitigation and preparedness is seen as the joint responsibility of all the Departments concerned and disaster management concerns are mainstreamed into their programmes. This holistic and multidisciplinary approach is the key to effective mitigation.
14. At the district level, the District Magistrate who is the chief coordinator will be the focal point for coordinating all activities relating to prevention, mitigation and preparedness apart from his existing responsibilities pertaining to response and relief. The District Coordination and Relief Committee is being reconstituted/re-designated into Disaster Management Committees with officers from relevant departments being added as members. Because of its enhanced mandate of mitigation and prevention, the district heads and departments engaged in development will now be added to the Committee so that mitigation and prevention is mainstreamed into the district plan. The existing system of drawing up preparedness and response plans will continue. There will, however, also be a long term mitigation plan. District Disaster Management Committees have already been constituted in several districts and are in the process of being constituted in the remaining multi-hazard prone districts.
15. Similarly, we are in the process of creating Block/Taluq Disaster Management Committees in these 169 multi-hazard prone districts in 17 States. At the village level, in 169 multi-hazard prone districts, we constitute Disaster Management Committees and Disaster

Management Teams. Each village will have a Disaster Management Plan. The process of drafting the plan has already begun. The Disaster Management Committee which draws up the plans consists of elected representatives at the village level, local authorities, Government functionaries including doctors/paramedics of primary health centres located in the village, primary school teachers etc. The plan encompasses prevention, mitigation and preparedness measures. The Disaster Management Teams at the village level will consist of members of voluntary organisations like Nehru Yuvak Kendra and other non-governmental organisations as well as able bodied volunteers from the village. The teams are provided basic training in evacuation, search and rescue etc. The Disaster Management Committee will review the disaster management plan at least once in a year. It would also generate awareness among the people in the village about dos' and don'ts for specific hazards depending on the vulnerability of the village. A large number of village level Disaster Management Committees and Disaster Management Teams have already been constituted.

16. The States have been advised to enact Disaster Management Acts. These Acts provide for adequate powers for authorities coordinating mitigation, preparedness and response as well as for mitigation/prevention measures required to be undertaken. Two States [Gujarat & Madhya Pradesh] have already enacted such a law. Other States are in the process. The State Governments have also been advised to convert their Relief Codes into Disaster Management Codes by including aspects of prevention, mitigation and preparedness.
17. In order to further institutionalize the new approach, the Government of India have decided to enunciate a National Policy on Disaster Management. A draft policy has accordingly been formulated and is expected to be put in place shortly. The policy shall inform all spheres of Central Government activity and shall take precedence over all existing sectoral policies. The broad objectives of the policy are to minimize the loss of lives and social, private and community assets because of natural or manmade disasters and contribute to sustainable development and better standards of living for all, more specifically for the poor and vulnerable sections by ensuring that the development gains are not lost through natural calamities/disasters.
18. The policy notes that State Governments are primarily responsible for disaster management including prevention and mitigation, while the Government of India provides assistance where necessary as per the norms laid down from time to time and proposes that this overall framework may continue. However, since response to a disaster requires coordination of resources available across all the Departments of the Government, the policy mandates that

the Central Government will, in conjunction with the State Governments, seek to ensure that such a coordination mechanism is laid down through an appropriate chain of command so that mobilization of resources is facilitated.

19. The broad features of the draft national policy on disaster management are enunciated below:-

- a. A holistic and pro-active approach for prevention, mitigation and preparedness will be adopted for disaster management.
- b. Each Ministry/Department of the Central/State Government will set apart an appropriate quantum of funds under the Plan for specific schemes/projects addressing vulnerability reduction and preparedness.
- c. Where there is a shelf of projects, projects addressing mitigation will be given priority. Mitigation measures shall be built into the on-going schemes/programmes.
- d. Each project in a hazard prone area will have mitigation as an essential term of reference. The project report will include a statement as to how the project addresses vulnerability reduction.
- e. Community involvement and awareness generation, particularly that of the vulnerable segments of population and women has been emphasized as necessary for sustainable disaster risk reduction. This is a critical component of the policy since communities are the first responders to disasters and, therefore, unless they are empowered and made capable of managing disasters, any amount of external support cannot lead to optimal results.
- f. There will be close interaction with the corporate sector, nongovernmental organisations and the media in the national efforts for disaster prevention/vulnerability reduction.
- g. Institutional structures/appropriate chain of command will be built up and appropriate training imparted to disaster managers at various levels to ensure coordinated and quick response at all levels; and development of inter-State arrangements for sharing of resources during emergencies.
- h. A culture of planning and preparedness is to be inculcated at all levels for capacity building measures.
- i. Standard operating procedures and disaster management plans at state and district levels as well as by relevant central government departments for handling specific disasters will be laid down.

- j. Construction designs must correspond to the requirements as laid down in relevant Indian Standards.
- k. All lifeline buildings in seismic zones III, IV & V – hospitals, railway stations, airports/airport control towers, fire station buildings, bus stands major administrative centres will need to be evaluated and, if necessary, retro-fitted.
- l. The existing relief codes in the States will be revised to develop them into disaster management codes/manuals for institutionalizing the planning process with particular attention to mitigation and preparedness.

## **9.6 Disaster Prevention and Mitigation**

1. The Yokohama message emanating from the international decade for natural disaster reduction in May, 1994 underlined the need for an emphatic shift in the strategy for disaster mitigation. It was inter alia stressed that disaster prevention, mitigation, preparedness and relief are four elements which contribute to and gain, from the implementation of the sustainable development policies. These elements along with environmental protection and sustainable development, are closely inter related. Therefore, nations should incorporate them in their development plans and ensure efficient follow up measures at the community, sub-regional, regional, national and international levels. The Yokohama Strategy also emphasized that disaster prevention, mitigation and preparedness are better than disaster response in achieving the goals and objectives of vulnerability reduction. Disaster response alone is not sufficient as it yields only temporary results at a very high cost. Prevention and mitigation contribute to lasting improvement in safety and are essential to integrated disaster management.
2. The Government of India have adopted mitigation and prevention as essential components of their development strategy. The Tenth Five Year Plan document has a detailed chapter on Disaster Management. The plan emphasizes the fact that development cannot be sustainable without mitigation being built into developmental process. Each State is supposed to prepare a plan scheme for disaster mitigation in accordance with the approach outlined in the plan. In brief, mitigation is being institutionalized into developmental planning.
3. As indicated in the earlier chapter, the Finance Commission makes recommendations with regard to devolution of funds between the Central Government and State Governments as also outlays for relief and rehabilitation. The earlier Finance Commissions were mandated to look at relief and rehabilitation. The Terms of Reference of the Twelfth Finance

Commission have been changed and the Finance Commission has been mandated to look at the requirements for mitigation and prevention apart from its existing mandate of looking at relief and rehabilitation. A Memorandum has been submitted to the Twelfth Finance Commission after consultation with States. The Memorandum proposes a Mitigation Fund.

4. The Government of India have issued guidelines that where there is a shelf of projects, projects addressing mitigation will be given a priority. It has also been mandated that each project in a hazard prone area will have disaster prevention/mitigation as a term of reference and the project document has to reflect as to how the project addresses that term of reference.
5. Measures for flood mitigation were taken from 1950 onwards. As against the total of 40 million hectares prone to floods, area of about 15 million hectares have been protected by construction of embankments. A number of dams and barrages have been constructed. The State Governments have been assisted to take up mitigation programmes like construction of raised platforms etc. Floods continue to be a menace however mainly because of the huge quantum of silt being carried by the rivers emanating from the Himalayas. This silt has raised the bed level in many rivers to above the level of the countryside. Embankments have also gives rise to problems of drainage with heavy rainfall leading to water logging in areas outside the embankment.
6. Due to erratic behaviour of monsoons, both low and medium rain fall regions, which constitute about 68% of the total area, are vulnerable to periodical droughts. Our experience has been that almost every third year is a drought year. However, in some of the States, there may be successive drought years enhancing the vulnerability of the population in these areas. Local communities have devised indigenous safety mechanisms and drought oriented farming methods in many parts of the country. From the experience of managing the past droughts particularly the severe drought of 1987, a number of programmes have been launched by the Government to mitigate the impact of drought in the long run. These programmes include Drought Prone Area Programme (DPAP), Desert Development Programme (DDP), National Watershed Development Project for Rainfed Areas (NWDPR), Watershed Development Programme for Shifting Cultivation (WDPSC), Integrated Water Development Project (IWDP), Integrated Afforestation and Eco-development Project Scheme (IAEPS).
7. A comprehensive programme has been taken up for earthquake mitigation. Although, the BIS has laid down the standards for construction in the seismic zones, these were not being followed. The building construction in urban and suburban areas is regulated by the Town and Country Planning Acts and Building Regulations. In many cases, the Building

regulations do not incorporate the BIS codes. Even where they do, the lack of knowledge regarding seismically safe construction among the architects and engineers as well as lack of awareness regarding their vulnerability among the population led to most of the construction in the urban/sub-urban areas being without reference to BIS standards. In the rural areas, the bulk of the housing is non-engineered construction. The mode of construction in the rural areas has also changed from mud and thatch to brick and concrete construction thereby increasing the vulnerability. The increasing population has led to settlements in vulnerable areas close to the river bed areas which are prone to liquefaction. The Government have moved to address these issues.

8. National Core Group for Earthquake Mitigation has been constituted consisting of experts in earthquake engineering and administrators. The Core Group has been assigned with the responsibility of drawing up a strategy and plan of action for mitigating the impact of earthquakes; providing advice and guidance to the States on various aspects of earthquake mitigation; developing/organizing the preparation of handbooks/pamphlets/type designs for earthquake resistant construction; working out systems for assisting the States in the seismically vulnerable zones to adopt/integrate appropriate Bureau of Indian Standards codes in their building byelaws; evolving systems for training of municipal engineers as also practicing architects and engineers in the private sector in the salient features of Bureau of Indian Standards codes and the amended byelaws; evolving a system of certification of architects/engineers for testing their knowledge of earthquake resistant construction; evolving systems for training of masons and carry out intensive awareness generation campaigns.
9. A Committee of experts has been constituted to review the building byelaws. The State Governments have been advised to ensure rigorous enforcement of existing bye laws. A national programme for capacity building for earthquake mitigation has been finalized for imparting training to 10000 engineers in public and private sectors. Since earthquake engineering is not a part of course curriculum in engineering colleges at undergraduate level at present, it is proposed to select 3 to 4 leading engineering colleges in each State and train the faculty members of the civil engineering departments in earthquake engineering at the Indian Institutes of Technology and few other apex level institutes which have the requisite capabilities. These faculty members will take up training of municipal engineers as well as the training of engineers/architects in the private sector in RCC and masonry construction. The first phase of this programme for imparting training to 10000 engineers will be completed within a period of three years. The trained faculty members of the leading

engineering colleges will also assist the State Governments in the detailed evaluation of lifeline buildings and their retrofitting, wherever necessary.

10. It has been decided to include earthquake engineering education in the engineering colleges at undergraduate level. The course curriculum for this purpose has already been finalized by a group of experts taken from IITs and will be introduced in the engineering colleges within a year. A system of special audit of buildings is being put in place with a view to ensuring that the new constructions conform to the latest building byelaws, which have been reviewed and revised recently by Bureau of Indian Standards.
11. While these mitigation measures will take care of the new constructions, the problem of unsafe existing buildings stock would still remain. It will not be possible to address the entire existing building stock, therefore the life line buildings like hospitals, schools or buildings where people congregate like cinema halls, multi-storied apartments are being focussed on. The States have been advised to have these buildings assessed and where necessary retrofitted. The Ministry of Finance have been requested to advise the financial institutions to give loans for retrofitting on easy terms. Insofar as the private housing stock is concerned emphasis is placed on awareness generation.
12. An earthquake mitigation project has been finalized for reducing the vulnerability to earthquakes. The programme includes detailed evaluation and retrofitting of lifeline buildings such as hospitals, schools, water and power supply units, telecommunication buildings, airports/airport control towers, railway stations, bus stands and important administrative buildings. The programme also includes training of more than one hundred thousand masons for earthquake resistant constructions. Besides, assistance will be provided under this project to the State Governments to put in place appropriate techno legal regime.
13. An accelerated urban earthquake vulnerability reduction programme has been taken up in 38 cities in seismic zones III, IV & V with population of half a million and above. Sensitization workshop for engineers/architects, government functionaries and voluntary organizations have already been held in 36 of the 38 cities. Disaster mitigation and preparedness plans are under preparation in these cities. Awareness generation campaign has already been undertaken. The orientation courses for engineers and architects have been organized to impart knowledge about seismically safe construction and implementation of BIS norms. This programme will be further extended to 166 earthquake prone districts in seismic zones IV & V.
14. Rural housing and community assets for vulnerable sections of the population are created at a fairly large scale by the Ministry of Rural Development under the Indira Awas

Yojna(IAY) and Sampooran Grameen Rojgar Yojna(SGRY). About 250 thousand small but compact units are constructed every year, besides community assets such as community centres, recreation centres, anganwadi centres etc. Technology support is provided by about two hundred rural housing centres spread over the entire country. The Ministry of Rural Development are now under the process of revising their guidelines for construction of such dwelling units by incorporating appropriate earthquake/cyclone resistant features. Training to the functionaries in the rural housing centres will be organized through the Ministry of Home Affairs. This initiative is expected to go a long way for the construction and popularisation of seismically safe construction at village/block level.

15. A National Core Group on Cyclone Monitoring & Mitigation has been constituted. Experts from Indian Meteorological Department, National Centre for Medium Range Weather Forecasting, Central Water Commission, National Remote Sensing Agency and Indian Space Research Organisation have been made the Members of the Core Group, besides administrators from the relevant Ministries/Departments and State Governments vulnerable to cyclones. The Group has been assigned with the responsibility of looking warning protocols for cyclones; coordination mechanism between different Central and State Ministries/Departments/Organisations; mechanism for dissemination of warning to the local people and; cyclone mitigation measures required to be taken for the coastal States. The Group will also suggest short-term and long-term measures on technology up gradation.
16. A cyclone mitigation project has been formulated. The project inter alia includes components on strengthening of monitoring/warning systems, coastal shelter belt plantation, mangrove plantation, and construction of cyclone shelters, storm surge modelling and water envelope studies. The focus will be on regeneration of coastal shelter belt plantation and mangrove plantation where these have degenerated. The location of the cyclone shelters will be decided in such a manner that no person in the vulnerable zone is required to walk more than two kilometres to reach a cyclone shelter. The cyclone shelters will be multipurpose units to be run as schools or community centres in normal times and will have capacity to house 3000 to 5000 persons with adequate number of toilets, community kitchen and other facilities. Areas will be identified for providing shelter to livestock.
17. In the engineering designs for construction, special attention will be paid to the attachment of roof to the dwelling units so as to make such units cyclone proof, besides incorporating earthquake resistant features. The project will be taken up shortly and is expected to be completed over a period of five years.



18. A Disaster Risk Management Programme has been taken up with the assistance from UNDP, USAID and European Union in 169 most hazard prone districts in 17 States including all the 8 North Eastern State. The implementation of the project commenced from October, 2002 and is expected to be concluded by December, 2007. The programme components include awareness generation and public education, preparedness, planning and capacity building, developing appropriate policies, institutional, administrative, legal and techno-legal regime at State, District, Block, village, urban local body and ward levels for vulnerability reduction.
19. Under this programme Disaster Management Plans have been prepared for about 3500 villages, 250 Gram Panchayat, 60 blocks and 15 districts. Elected representatives of over 8000 Panchayati Raj Institutions have already been trained, besides imparting training to Members of voluntary organisations. Over 20000 Government functionaries have been trained in disaster mitigation and preparedness at different levels. About 600 engineers and 220 architects have been trained under this programme in vulnerability assessment of lifeline buildings. Training is being imparted to master trainers under the programme. More than 600 master trainers and 1000 teachers have already been trained in different districts in disaster mitigation. Disaster Management Committees consisting of elected representatives, civil society members, Civil Defence volunteers and Government functionaries have been constituted at all levels including village/urban local body/ward levels. Disaster Management Teams have been constituted in villages and are being imparted training in basic functions of first aid, rescue, evacuation and related issues. The thrust of the programme is to build up capabilities of the community since the community is invariably the first responder. During the last 15 months, it has been experienced that the capacity building of the community has been very helpful even in normal situations when isolated instances of drowning, burns etc. take place. With the creation of awareness generation on disaster mitigation, the community will be able to function as a well-knit unit in case of any emergency. Mock drills are carried out from time to time under the close supervision of Disaster Management Committees. The Disaster Management Committees and Disaster Management Teams have been established by notifications issued by the State Governments which will ensure that the entire system is institutionalized and does not disintegrate after the conclusion of the programme. The key points being stressed under this programme are the need to ensure sustainability of the programme, development of training modules; manuals and codes, up-scaling partnerships in excellence, focused attention to awareness generation campaigns; institutionalization of disaster management committees

and disaster management teams, disaster management plans and mock-drills and establishment of techno-legal regimes.

20. Human Resource Development at all levels is critical to institutionalization of disaster mitigation strategy. The National Centre for Disaster Management at the national level has been upgraded and designated as the National Institute of Disaster Management. It is being developed as a Regional Centre of Excellence in Asia. The National Institute of Disaster Management will develop training modules at different levels, undertake training of trainers and organize training programmes for planners, administrators and command functionaries. Besides, the other functions assigned to the National Institute of Disaster Management include development of exhaustive National level information base on disaster management policies, prevention mechanisms, mitigation measures; formulation of disaster management code and providing consultancy to various States in strengthening their disaster management systems and capacities as well as preparation of disaster management plans and strategies for hazard mitigation and disaster response.
21. Disaster Management faculties have already been created in 29 State level training institutes located in 28 States. These faculties are being directly supported by the Ministry of Home Affairs. The State Training Institutions take up several focused training programmes for different target groups within the State. The Disaster Management faculties in these Institutes are being further strengthened so as to enable them to develop as Institutes of Excellence for a specific disaster. This system has already been institutionalized and is being further strengthened so as to make it a focal point in each State for development of human resources in disaster mitigation and preparedness. Assistance to the State level training institutes will be provided by the National Institute of Disaster Management in the development of training/capsules training modules for different functionaries at different levels.
22. Large-scale awareness generation bringing out specific do's and don'ts is crucial to disaster mitigation. A Steering Committee on mass-media campaign has been constituted for this purpose. The Committee is in the process of developing a profile for taking up mass media campaign through audio, video and print media as well as publicity through pamphlets, posters, bus back panels at all levels. The posters would be prominently displayed at buildings like Primary Health Centres, Community Centres, schools and such other places where villagers normally congregate for community activity. The Corporate sector is also being associated with the dissemination of campaign.

23. Disaster management as a subject in Social Sciences has been introduced in the school curriculum for Class VIII from the current academic year. The Central Board of Secondary Education which has introduced the curriculum runs a very large number of schools throughout the country and the course curriculum is invariably followed by the State Boards of Secondary Education. Several State Governments have already introduced the same curriculum in Class VIII from the current academic year. Syllabus for Class IX and X has been finalized and will be introduced in the course curriculum from April, 2004 and April, 2005 respectively.
24. In order to assist the State Governments in capacity building and awareness generation activities and to learn from past experiences including sharing of best practices, the Ministry of Home Affairs has compiled/prepared a set of resource materials developed by various organisations/institutions to be replicated and disseminated by State Governments based on their vulnerabilities after translating it into the local languages. The voluminous material which runs in about 10000 pages has been divided into 4 broad sections in 7 volumes. These sections cover planning to cope with disasters; education and training; construction toolkit; and information, education and communication toolkit including multi-media resources on disaster mitigation and preparedness. The Planning section contains material for analyzing a community's risk, development of Preparedness, mitigation and disaster management plans, coordinating available resources and implementing measures for risk reduction. The model bye-laws, DM Policy, Act and model health sector plan have also been included. Education and Training includes material for capacity building and up gradation of skills of policy makers, administrators, trainers, engineers etc. in planning for and mitigating against natural disasters. Basic and detailed training modules in disaster preparedness have been incorporated along with training methodologies for trainers, for community preparedness and manuals for training at district, block, panchayat and village levels. For creating a disaster-resistant building environment, the Construction Toolkit addresses the issue of seismic resistant construction and retrofitting of existing buildings. BIS Codes, manuals and guidelines for RCC, Masonry and other construction methodologies as also for repair and retrofitting of masonry and low-rise buildings have been included.
25. IEC material seeks to generate awareness to induce mitigation and preparedness measures for risk reduction. Material and strategies used by various States and international organisations, including tips on different hazards, have been incorporated along with multi-media CDs on disasters. The material has been disseminated to all the State Governments/UT Administrations with the request to have the relevant material, based on

the vulnerability of each district, culled out, translated into local languages and disseminate it widely down to the village level.

26. The various prevention and mitigation measures outlined above are aimed at building up the capabilities of the communities, voluntary organisations and Government functionaries at all levels. Particular stress is being laid on ensuring that these measures are institutionalized considering the vast population and the geographical area of the country. This is a major task being undertaken by the Government to put in place mitigation measures for vulnerability reduction. This is just a beginning. The ultimate goal is to make prevention and mitigation a part of normal day-to-day life. The above mentioned initiatives will be put in place and information disseminated over a period of five to eight years. We have a firm conviction that with these measures in place, we could say with confidence that disasters like Orissa cyclone and Bhuj earthquake will not be allowed to recur in this country; at least not at the cost, which the country has paid in these two disasters in terms of human lives, livestock, loss of property and means of livelihood.

### **Questions:**

1. Define Rural Infrastructure Management? List out the schemes for upliftment of rural infrastructure initiated by government of India?
2. Write down the reforms that are identified in the development of rural infrastructure?
3. What do you mean by disaster management? Discuss about the Institutional and Policy Framework of disaster management?
4. How you would suggest regarding disaster prevention and mitigation?

### **Suggested Readings**

- Katar Singh (2009), Rural Development: Principles, Policies and Management, SAGE Publications India Pvt. Ltd. Publication year: 2009.
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**CERTIFICATE COURSE IN RURAL MANAGEMENT**

**COURSE: RURAL MANAGEMENT**

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**UNIT 10: COMMUNICATION CHANNELS: USES FOR RURAL MANAGEMENT,  
COMMUNICATION STRATEGIES FOR RURAL MANAGEMENT**

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**STRUCTURE**

**10.0 Objectives**

**10.1 Introduction**

**10.2 Emerging Tools of IMC**

**10.2.1 Sponsorships (Event Marketing)**

**10.2.2 Social Media Marketing**

**10.2.3 Internet Marketing**

**10.2.4 Mobile Marketing**

**10.3 3A's of the Adoption Process**

**10.4 Types of media and their characteristics**

**10.5 Uses of Communication Channel for Rural Development**

**10.6 Introduction (Communication Strategies for Rural Management)**

**10.7 Formulation of communication development strategy**

**10.7.1 Selecting key issues to address**

**10.7.2 Identifying and profiling priority stakeholders**

**10.7.3 Identifying and profiling priority stakeholders**

**10.7.4 Choosing the appropriate communication approach**

**10.7.5 Identifying the core content of the Communication development strategy**

**10.7.6 Selecting communication methods and channels**

**10.8 Challenges to Rural Communication**

**10.9 Communication Delivery Strategy**

**10.10 Media Strategy for FMCG Products**

**10.11 Media Strategy for Consumer Durables/Services**

**Questions**

**Suggested Readings**

## **10.0 Objectives**

1. Prioritise needs, select most important and establish development or project objectives to be addressed;
2. Identify target groups, carry out baseline knowledge, attitudes, practices, conduct focus group sessions, set specific communication.
3. Determine multi-media mix and message design.
4. Distinguish the one-way or two-way flow of message.
5. List the various characteristics of communication channels.
6. Explain the implications of communication channels in rural development.
7. To Formulate of communication development strategy.

## **Communication Channels: Uses for Rural Management**

### **10.1 Introduction**

The global economic meltdown has taken its toll on the manufacturing and service sector of the economy, which, in turn, has slowed down the urban market. The companies cutting across sectors have discovered the importance of rural markets. With urban India in the grip of a slowdown, the rural market is helping industries like automobiles, cement, consumer electronics, textiles, telecommunications and FMCGs grow. While urban organised retail is in pain, its rural counterpart is thriving. All of a sudden, the consumer in the laid back Indian village is being spoilt for choice. The rural incomes are progressing, thanks to the Government initiatives like National Rural Employment Guarantee Scheme (NREGS) launched in 2006 which promised employment of at least 100 days to every member of a poor rural household. This served three purposes:

It built rural infrastructure

Plugged pilferage of funds

Boosted the disposable incomes of rural families

The scheme was rolled out to all the 596 districts of the country. All told, Rs 66,800 crores has been earmarked for the programme. Another boost for liquidity among farmers came with the farm loan waiver of Rs 65,318 crores carried out by the Government last year.

The bottom-line is clear. Customers in villages have their own set of aspirations and are willing to pay for the right services. Companies are understanding that to play the game in rural markets is to understand and innovate products exclusively for the rural consumers and after tasting success can also be replicated in the urban markets. For example, Tata Sky launched DTH (Direct to Home) primarily for the urban markets. However, in the rural entry, the package has been at Rs 99 per month which was a mini-thali of sorts with a bit of everything. The promotional campaigns included taking Aamir Khan as the brand ambassador who could easily appeal across the rural-urban divide and they also do a lot of promotions and demonstrations so as to motivate the local distributors who highlight the benefits of the service. Tata Sky has launched the Rs 99 pack in the urban markets as well.

Advertising goes hand in hand with economic growth. With economic liberalization and increasing rural prosperity, marketers are keen to inform villagers about the benefits of buying and consuming their products and services. Prior to the introduction of economic liberalization in 1990s, there was



little incentive for marketers to advertise their products and services, as rural markets were predominantly a seller's market.

The influence of the electronic media, in particular television, video and the Hindi film industry, is contributing to the growth of rural aspirations, which are being manifested in rural India in the form of increasing consumerism.

The rural environment is different from the urban and therefore communication to potential customers in a proper and effective manner is a major challenge for corporate marketers. The majority of advertisements designed by corporate marketers, are largely urban oriented and extend themselves to rural areas without any consideration to the values and sensitivities of the rural audience, which are often in striking contrast to those of their urban counterparts. This has led to a negative perception in the minds of villagers, about urban media planners and advertisers.

Rural communication is not a 'peripheral activity'. It does not, for instance, involve taking an audio-visual van to a village and assuming that this step is enough to reach out to customers. It requires an entirely different mindset, which demands getting rid of many mental barriers. Companies have to realize that rural is a long-haul market, as gains in the short term are neither immediate nor large.

### **Challenges in Rural Communications**

There are many challenges to communication in rural. Low literacy level; poor media reach and exposure and vast, heterogeneous and diversely spread rural audiences characterized by variations in language, culture and lifestyle-all these factors pose multiple challenges to marketers looking to take their messages to the largely media-dark or media-grey areas, of rural markets.

### **Heterogeneity and Spread**

The communication pattern in any society is a part of its culture. No communication medium can exist in a cultural vacuum. Communicating the message to rural consumers has posed enormous challenges to the rural marketer, because of the large numbers of consumers scattered across the country. The problem is further compounded by the heterogeneous nature of consumers there are 16 scheduled languages and 114 local vernaculars. For example, the dialects used in the Vidharbha region, in Konkan region, in coastal Maharashtra etc.

### **Limited Media Reach**

The limited reach of the mass media imposes limitations on universal communication to rural consumers. These factors lead to poor message comprehension and negligible impact, which fail to translate into consumer awareness and hence fail in generating consumer pull.

### **Understanding the Rural Audience**

It is not sufficient to understand rural communication challenges as stated above: rather, what is equally crucial is the need to understand the behavioural and psychographic characteristics of the rural audience, in order to develop an effective rural communication strategy.

### **Integrated Marketing Communications (IMC) Tools**

IMC is a management concept that is designed to make all aspects of marketing communication such as advertising, sales promotion, public relations, personal selling and direct marketing work together as a unified force, rather than permitting each to work in isolation.

### **Advertising**

Advertising has four characteristics: it is persuasive in nature; it is non-personal; it is paid for by an identified sponsor; and it is disseminated through mass channels of communication. Advertising messages may promote the adoption of goods, services, persons, or ideas. Because the sales message is disseminated through the mass media-as opposed to personal selling-it is viewed as a much cheaper way of reaching consumers. However, its non-personal nature means it lacks the ability to tailor the sales message to the message recipient and, more importantly, actually get the sale. Therefore, advertising effects are best measured in terms of increasing awareness and changing attitudes and opinions, not creating sales. Advertising's contribution to sales is difficult to isolate because many factors influence sales. The contribution advertising makes to sales are best viewed over the long run. The exception to this thinking is within the internet arena. While banner ads, pop-ups and interstitials should still be viewed as brand promoting and not necessarily sales drivers, technology provides the ability to track how many of a website's visitors click the banner, investigate a product, request more information, and ultimately make a purchase.

Through the use of symbols and images advertising can help differentiate products and services that are otherwise similar. Advertising also helps create and maintain brand equity. Brand equity is an intangible asset that results from a favorable image, impressions of differentiation, or consumer attachment to the company, brand, or trademark. This equity translates into greater sales volume, and/or higher margins, thus greater competitive advantage. Brand equity is established and maintained through advertising that focuses on image, product attributes, service, or other features of the company and its products or services.

Cost is the greatest disadvantage of advertising. The average cost for a 30-second spot on network television increased fivefold between 1980 and 2005. Plus, the average cost of producing a 30-second ad for network television is quite expensive. It is not uncommon for a national advertiser to spend in the millions of dollars for one 30-second commercial to be produced. Add more millions on top of that if celebrity talent is utilized.

Credibility and clutter are other disadvantages. Consumers have become increasingly skeptical about advertising messages and tend to resent advertisers' attempt to persuade. Advertising is everywhere, from network television, to daily newspapers, to roadside billboards, to golf course signs, to stickers on fruit in grocery stores. Clutter encourages consumers to ignore many advertising messages. New media are emerging, such as DVRs (digital video recorders) which allow consumers to record programs and then skip commercials, and satellite radio which provides a majority of its channels advertising free.

### **Public Relations (PR)**

Public relations is defined as a management function which identifies, establishes, and maintains mutually beneficial relationships between an organization and the public upon which its success or failure depends. Whereas advertising is a one-way communication from sender (the marketer) to the receiver (the consumer or the retail trade), public relations considers multiple audiences (consumers, employees, suppliers, vendors, etc.) and uses two-way communication to monitor feedback and adjust both its message and the organization's actions for maximum benefit. A primary tool used by public relations practitioners is publicity. Publicity capitalizes on the news value of a product, service, idea, person or event so that the information can be disseminated through the news media. This third party "endorsement" by the news media provides a vital boost to the marketing communication message: credibility. Articles in the media are perceived as being more objective than advertisements, and their messages are more likely to be absorbed and believed. For example, after the CBS newsmagazine 60 Minutes reported in the early 1990s that drinking moderate amounts of red wine could prevent heart attacks by lowering cholesterol, red wine sales in the United States increased 50 percent. Benefit publicity offers is that it is free, not considering the great amount of effort it can require to get out-bound publicity noticed and picked up by media sources.

Public relations' role in the promotional mix is becoming more important because of what Philip Kotler describes as an "over communicated society." Consumers develop "communication-avoidance routines" where they are likely to tune out commercial messages. As advertising loses

some of its cost-effectiveness, marketers are turning to news coverage, events, and community programs to help disseminate their product and company messages. Some consumers may also base their purchase decisions on the image of the company, for example, how environmentally responsible the company is. In this regard, public relations plays an important role in presenting, through news reports, sponsorships, “advertorials” (a form of advertising that instead of selling a product or service promotes the company’s views regarding current issues), and other forms of communication, what the company stands for.

### **Sales Promotions (SP)**

Sales promotions are direct inducements that offer extra incentives to enhance or accelerate the product’s movement from producer to consumer. Sales promotions may be directed at the consumer or the trade. Consumer promotions such as coupons, sampling, premiums, sweepstakes, price packs (packs that offer greater quantity or lower cost than normal), low-cost financing deals, and rebates are purchase incentives in that they induce product trial and encourage repurchase. Consumer promotions may also include incentives to visit a retail establishment or request additional information. Trade promotions include slotting allowances (“buying” shelf space in retail stores), allowances for featuring the brand in retail advertising, display and merchandising allowances, buying allowances (volume discounts and other volume-oriented incentives), bill back allowances (pay-for-performance incentives), incentives to salespeople, and other tactics to encourage retailers to carry the item and to push the brand.

Two perspectives may be found among marketers regarding sales promotion. First, sales promotion is supplemental to advertising in that it binds the role of advertising with personal selling. This view regards sales promotion as a minor player in the marketing communication program. A second view regards sales promotion and advertising as distinct functions with objectives and strategies very different from each other. Sales promotion in this sense is equal to or even more important than advertising. Some companies allocate as much as 75 percent of their advertising/promotion dollars to sales promotion and just 25 percent to advertising. Finding the right balance is often a difficult task. The main purpose of sales promotion is to spur action. Advertising sets up the deal by developing a brand reputation and building market value. Sales promotion helps close the deal by providing incentives that build market volume.

Sales promotions can motivate customers to select a particular brand, especially when brands appear to be equal, and they can produce more immediate and measurable results than advertising. However, too heavy a reliance on sales promotions results in “deal-prone” consumers with little

brand loyalty and too much price sensitivity. Sales promotions can also force competitors to offer similar inducements, with sales and profits suffering for everyone.

### **Personal Selling (PS)**

Personal selling includes all person-to-person contact with customers with the purpose of introducing the product to the customer, convincing him or her of the product's value, and closing the sale. The role of personal selling varies from organization to organization, depending on the nature and size of the company, the industry, and the products or services it is marketing. Many marketing executives realize that both sales and non-sales employees act as salespeople for their organization in one way or another. One study that perhaps supports this contention found that marketing executives predicted greater emphasis being placed on sales management and personal selling in their organization than on any other promotional mix element. These organizations have launched training sessions that show employees how they act as salespeople for the organization and how they can improve their interpersonal skills with clients, customers, and prospects. Employee reward programs now reward employees for their efforts in this regard.

Personal selling is the most effective way to make a sale because of the interpersonal communication between the salesperson and the prospect. Messages can be tailored to particular situations, immediate feedback can be processed, and message strategies can be changed to accommodate the feedback. However, personal selling is the most expensive way to make a sale, with the average cost per sales call ranging from \$235 to \$332 and the average number of sales calls needed to close a deal being between three and six personal calls.

Sales and marketing management classifies salespersons into one of three groups: creative selling, order taking, and missionary sales reps. Creative selling jobs require the most skills and preparation. They are the "point person" for the sales function. They prospect for customers, analyze situations, determine how their company can satisfy wants and needs of prospects, and, most importantly, get an order. Order takers take over after the initial order is received. They handle repeat purchases (straight rebuys) and modified rebuys. Missionary sales reps service accounts by introducing new products, promotions, and other programs. Orders are taken by order takers or by distributors.

### **Direct Marketing (DM)**

Direct marketing, the oldest form of marketing, is the process of communicating directly with target customers to encourage response by telephone, mail, electronic means, or personal visit. Users of direct marketing include retailers, wholesalers, manufacturers, and service providers, and they use

a variety of methods including direct mail, telemarketing, direct-response advertising, online computer shopping services, cable shopping networks, and infomercials. Traditionally not viewed as an element in the promotional mix, direct marketing represents one of the most profound changes in marketing and promotion in the last 25 years. Aspects of direct marketing, which includes direct response advertising and direct mail advertising as well as the various research and support activities necessary for their implementation, have been adopted by virtually all companies engaged in marketing products, services, ideas, or persons.

Direct marketing has become an important part of many marketing communication programs for three reasons. First, the number of two-income households has increased dramatically. About six in every ten women in the United States work outside the home. This has reduced the amount of time families have for shopping trips. Secondly, more shoppers than ever before rely on credit cards for payment of goods and services. These cashless transactions make products easier and faster to purchase. Finally, technological advances in telecommunications and computers allow consumers to make purchases from their homes via telephone, television, or computer with ease and safety. These three factors have dramatically altered the purchasing habits of American consumers and made direct marketing a growing field worldwide.

Direct marketing allows a company to target more precisely a segment of customers and prospects with a sales message tailored to their specific needs and characteristics. Unlike advertising and public relations, whose connections to actual sales are tenuous or nebulous at best, direct marketing offers accountability by providing tangible results. The economics of direct marketing have also improved over the years as more information is gathered about customers and prospects. By identifying those consumers they can serve more effectively and profitably, companies may be more efficient in their marketing efforts. Whereas network television in the past offered opportunities to reach huge groups of consumers at a low cost per thousand, direct marketing can reach individual consumers and develop a relationship with each of them.

Research indicates that brands with strong brand equity are more successful in direct marketing efforts than little-known brands. Direct marketing, then, works best when other marketing communication such as traditional media advertising supports the direct marketing effort.

Direct marketing has its drawbacks also. Just as consumers built resistance to the persuasive nature of advertising, so have they with direct marketing efforts. Direct marketers have responded by being fewer sales oriented and more relationship oriented. Also, just as consumers grew weary of

advertising clutter, so have they with the direct marketing efforts. Consumers are bombarded with mail, infomercials, and telemarketing pitches daily. Some direct marketers have responded by regarding privacy as a customer service benefit. Direct marketers must also overcome consumer mistrust of direct marketing efforts due to incidents of illegal behavior by companies and individuals using direct marketing. The U.S. Postal Service, the Federal Trade Commission, and other federal and state agencies may prosecute criminal acts. The industry then risks legislation regulating the behavior of direct marketers if it is not successful in self-regulation. The Direct Marketing Association, the leading trade organization for direct marketing, works with companies and government agencies to initiate self-regulation. In March of 2003 the National Do Not Call Registry went into effect whereby consumers added their names to a list that telemarketers had to eliminate from their out-bound call database.

## **10.2 Emerging Tools of IMC**

### **10.2.1 Sponsorships (Event Marketing)**

Sponsorships, or event marketing, combine advertising and sales promotions with public relations. Sponsorships increase awareness of a company or product, build loyalty with a specific target audience, help differentiate a product from its competitors, provide merchandising opportunities, demonstrate commitment to a community or ethnic group, or impact the bottom line. Like advertising, sponsorships are initiated to build long-term associations. Organizations sometimes compare sponsorships with advertising by using gross impressions or cost-per-thousand measurements. However, the value of sponsorships can be very difficult to measure. Companies considering sponsorships should consider the short-term public relations value of sponsorships and the long-term goals of the organization. Sports sponsorships make up about two-thirds of all sponsorships.

### **10.2.2 Social Media Marketing**

The concept of social media marketing basically refers to the process of promoting business or websites through social media channels. It is a powerful marketing medium that is defining the way people are communicating. It is one of the significantly low-cost promotional methods that provide

businesses large numbers of links and huge amount of traffic. Companies manage to get massive attention and that really works in favour of the business. Social media marketing is a potent method applied by progressive companies for selling their products/services or for just publishing content for advertisement revenue.

Social media is an extremely useful tool using which companies can get their information, product descriptions, promotions all ingrained in the chain of networking world. Considering the newness of this marketing method, organizations are coming up with innovative ways to develop their marketing plans. New platforms are being created to approach potential clients. A large number of business organizations are allocating budget for online business development using social media marketing. It is a booming sector which is going to redefine the way marketing strategies are being formed and promoted.

### **10.2.3 Internet Marketing**

Internet marketing also referred to as i-marketing, web-marketing, online-marketing or e-Marketing, is the marketing of products or services over the Internet. The Internet has brought media to a global audience. The interactive nature of Internet marketing in terms of providing instant responses and eliciting responses are the unique qualities of the medium. Internet marketing is sometimes considered to be broad in scope because it not only refers to marketing on the Internet, but also includes marketing done via e-mail and wireless media. Management of digital customer data and electronic customer relationship management (ECRM) systems are also often grouped together under internet marketing.

Internet marketing ties together creative and technical aspects of the Internet, including: design, development, advertising, and sales.

Internet marketing also refers to the placement of media along many different stages of the customer engagement cycle through search engine marketing (SEM), search engine optimization (SEO), banner ads on specific websites, e-mail marketing, and Web 2.0 strategies.

### **10.2.4 Mobile Marketing**



Mobile Marketing involves communicating with the consumer via cellular (or mobile) device, either to send a simple marketing message, to introduce them to a new audience participation-based campaign or to allow them to visit a mobile website.

Mobile connectivity not only enables people to connect to the Internet via a cellular telephone, PDA or other gadget, but also consolidates the different communication channels in a simple, yet effective medium.

Cheaper than traditional means for both the consumer and the marketer – and easy enough for almost any age group to understand and engage with – Mobile Marketing really is a streamlined version of traditional e-Marketing.

### **Strategic Framework for IMC in Rural Markets in India**

A strategic framework for implementing Integrated Marketing Communications (IMC) in the rural markets in India has been proposed. The following are the elements of the framework:

Objectives: The firms need to set and review their objectives for the rural markets. The desired effects and output needed from an integrated communications programme need to be decided and this becomes the base for the next steps in the implementation framework.

#### **10.3 3A's of the Adoption Process:**

Awareness Creation: Firstly, awareness needs to be created about the brand and the product in the rural market. An urban product might have low or almost nil awareness level in the rural market. The various tools that should be used at this stage are Public Relations, Direct Marketing, Advertising and Events.

Adopt the Brand: Once awareness has been created about the brand, steps need to be taken so that the rural markets adopt the brand. The various tools that should be used at this stage are Personal Selling, Sales Promotions and Road shows.

Brand Purchase: Once people have adopted the brand, steps must be taken to ensure that people purchase the brand and become repeat buyers. The tools which must be used at this stage are Sales Promotion and Personal Selling.

IMC Tools: As mentioned before, different tools serve different purposes in the rural markets. For awareness creation, Public Relations, Direct Marketing, Advertising and Events are useful. Rural advertising will be different from the urban advertising keeping in mind the different profiles of the rural customers. Events also are very effective tools as they engage prospective consumers.

The tools useful for adopting the brand are Personal Selling, Sales Promotions and Road shows. The markets accept and adopt the brands once salience has been achieved in the previous stage. Road shows are newer IMC tools which are proving to be very effective. They should be leveraged in the rural markets.

In the brand purchase stage, tools like Personal Selling and Sales Promotions must be used as they have a direct impact on the brand purchase by providing incentives and more direct information about the brand.

Select Right Mix of IMC: All these above mentioned tools need to be used judiciously and in the right proportion to achieve the desired marketing objectives. There needs to be a strategic fit between the chosen tools and the IMC objectives. Depending on the stages of the adoption process, the corresponding tools should be given importance over others and also overall media budget must be considered.

Adds Incremental Value to the Firm: The implementation of an Integrated Marketing Communications (IMC) model in the rural markets in the above mentioned manner will add incremental value to the firm.

Since most of the corporate are looking in a big manner to exploit the rural markets in India, the above strategic framework might be useful for them to devise an IMC strategy. And it goes without saying that an urban IMC will be different from a rural IMC.

#### **10.4 Types of media and their characteristics**

There is no magic formula for choosing the channel most suitable to the intended stakeholders. Oftentimes, combining more than one media available in a locale produces the best results. Among the wide range of communication channels, the most commonly used in rural development projects are:

- Folk media – local media with limited geographical coverage, traditional of a particular community. They include theatre, puppetry, drama skits, songs, music, sayings, poetry and storytelling.
- Community media – media which are controlled by the community and are non-profit and non-commercial. They cater to a small geographic community and a homogenous audience with similar interests. They have localized content, are accessible to people, and utilize indigenous resources. Examples are community radio, community television, wall newspaper, folk media and audio tower system.
- Mainstream or mass media – those with national coverage, usually commercial in nature, managed and staffed by media professionals.
- Information and communication technologies (ICTs) – an umbrella term that encompasses ‘new’ communication devices such as mobile phones, computer/network hardware and satellite systems, as well as the various services and applications associated with them such as the world wide web, email, blog, videoconferencing and electronic archives, among others. ‘Old’ electronic media such as radio and television, as well as video and photo, are included in the ICT category when they use digital technologies (in the so called ‘media convergence’).
- Social media – web-based media that offer new ways to interact with other people online and to publish information with free, easy tools (e.g. web 2.0). Examples of social media are internet forums, weblogs, social blogs, micro blogging, wikis, podcasts, photographs or pictures, video and social bookmarking

## **10.5 Uses of Communication Channel for Rural Development**

### **Folk media (e.g. puppetry, community theatre, storytelling)**

- Can be easily understood by all members of the community
- Intrinsically adapted to local cultural scene
- Can use familiar dialects for the most intimate and local communication at the village level
- Appeals at the personal level
- Does not depend on technology that is liable to break down
- Comparatively cheap to produce since most of the resources needed are available in the community

### **Radio**

- Wide coverage and availability/accessibility even in rural areas

- Low production cost
- Delivery of information can be localized
- Well-segmented audience

### **Television**

- Wide coverage
- Combines sight, sound, and motion, thus, more attention grabbing
- High prestige

### **Video**

- Combines sight, sound, and motion, thus, more attention grabbing
- Highly persuasive
- Constantly improving technology is making production ever cheaper and more reliable
- Can be played back
- Allows more than one language to be recorded as commentary on a single tape.

### **Printed materials (e.g. leaflet, brochure, magazine, newspaper)**

- Relatively cheap, simple, and easy to produce
- Can be taken home, consulted, and kept as a permanent reminder
- Particularly valuable for extensionists, technicians, and community leaders.

### **Visual media (e.g. flipchart, poster, billboard, comics)**

- Cheap and simple to produce and use
- Good for training and extension support in areas where there is no electricity
- Use of images helps people recall and remember concepts better
- Easy to use.

### **Mobile phones**

- Capable of a variety of tasks such as sending and receiving messages, recording audio and visual images, playing video and audio files, browsing the Internet, and organizing files
- Compact and easy to use

### **Internet and social media**

- Facilitates the exchange of information among stakeholders regardless of geographical boundaries

- Links all stakeholders
- Encourages interactivity
- More flexible in delivering information

In communicating rural development issues on food security, climate adaptation or natural resource management, creating linkages with mainstream media and ICTs is advantageous. This is done not only to maximize the potential and strengths of community media, but also to enhance the efficiency of development initiatives. Community media can localize content to facilitate the community's better understanding and appreciation of information, and to promote a sense of involvement for community members to plan and perform specific actions. On the other hand, local and mainstream media can link communities with provincial, regional or national authorities and mobilize other development organizations to support community actions.

Potential areas of collaboration include:

- co-production and sharing of materials (e.g. plugs, articles, documentaries, expert's views);
- identification and coordination with authorities, subject matter specialists and resource persons;
- Implementation of media-based action programmes.

## **Communication Strategies for Rural Management**

### **10.6 Introduction**

Rural communication is an interactive process in which information, knowledge and skills, relevant for development are exchanged between farmers, extension/advisory services, information providers and research either personally or through media such as radio, print and more recently the new "Information and Communication Technologies" (ICTs). In this process all actors may be innovators, intermediaries and receivers of information and knowledge. The aim is to put rural people in a position to have the necessary information for informed decision-making and the relevant skills to improve their livelihoods. Communication in this context is therefore a non-linear process with the content of data or information.

In Communication for Development approaches, rural people are at the centre of any given development initiative and view planners, development workers, local authorities, farmers and rural people as "communication equals", equally committed to mutual understanding and concerted

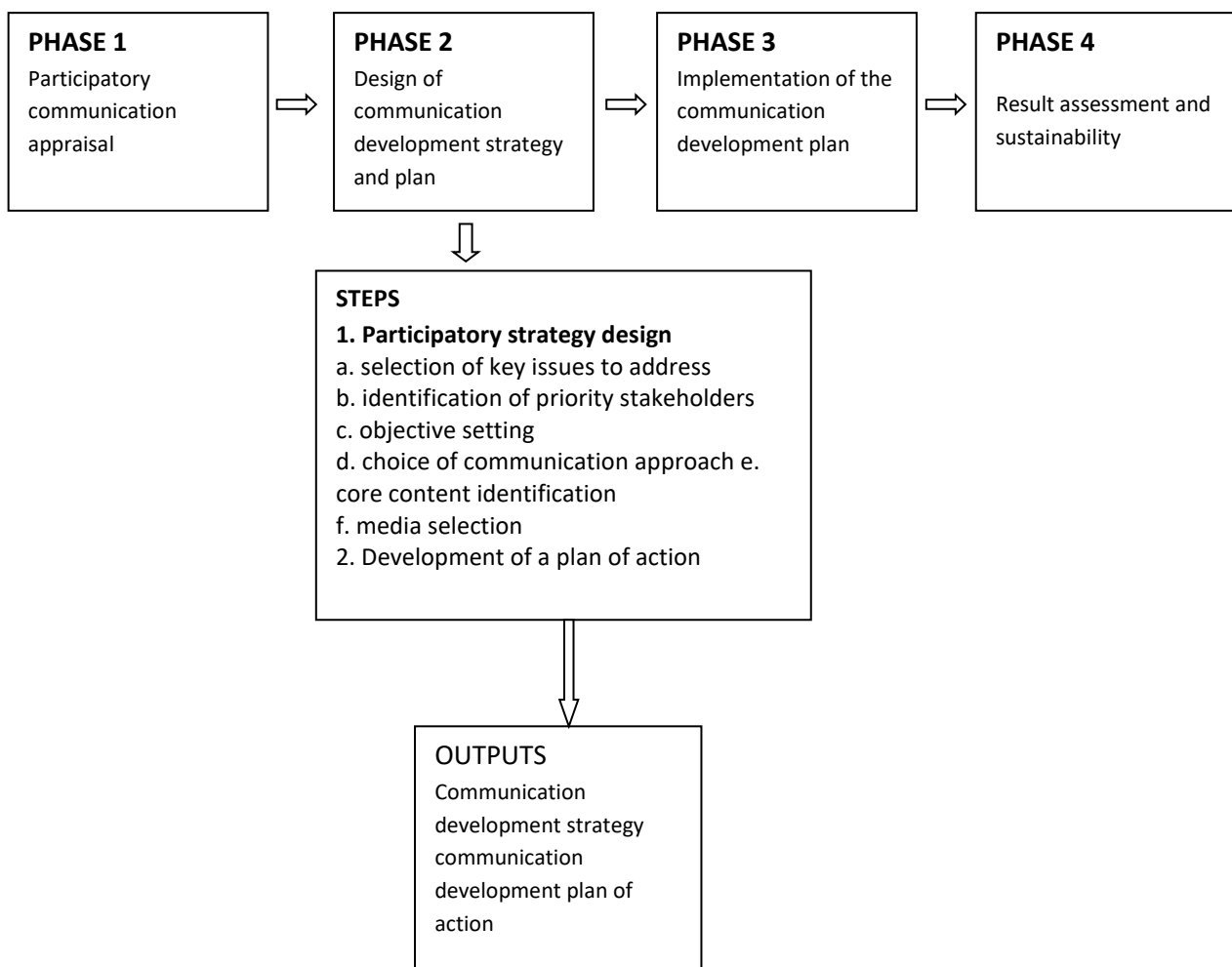
action. Communication for development is used for: people’s participation and community mobilization, decision-making and action, confidence building, for raising awareness, sharing knowledge and changing attitudes, behaviour and lifestyles; for improving learning and training and rapidly spreading information; to assist with programme planning and formulation; to foster the support of decision-makers.

### 10.7 Formulation of communication development strategy

Community participation is fundamental to formulate a locally relevant and effective communication strategy for agricultural and rural development projects.

The various steps have been shown in Figure. The Communication development plan will later identify major activities, outputs and inputs needed to put the strategy into action.

#### The Communication development planning process



The key concepts introduced in this module include:

**Participatory communication strategy design (PCSD)** is the process in communication development planning that uses the findings from the participatory field appraisal to set communication objectives that respond to the needs and priorities of local stakeholders. It also determines the content and channels of communication development activities and services.

**Communication development strategy** is an integrated set of communication objectives, approaches, messages and channels to achieve overall project outcomes. It sets the lines of action that will bring stakeholders to jointly address communication-related issues and move forward to accomplish common goals.

**Communication development plan of action** is a tool to specify and schedule activities and products, and allocate resources to make a communication development strategy operational on the ground. The communication development plan has to be fine-tuned with local stakeholders to facilitate their mobilization, commitment and control over communication activities.

**Priority communication stakeholders** are those individuals, groups and organizations involved in, or able to influence the outcomes of the Communication development strategy and activities (referred to as “audience” or “targets” in non-participatory communication planning).

**Communication objective** is a statement expressing desirable states or possible solutions to a specific issue, in terms of changes in stakeholders’ knowledge, attitudes, skills or practices, under a given set of conditions and with a certain degree of success. It must be simple, measurable, achievable, realistic and time-bound (SMART).

**Participatory communication approaches** refer to specific functions that twoway communication accomplishes in the framework of a Communication development strategy. These include awareness raising, information and knowledge sharing, social mobilization, advocacy, edutainment and negotiation, among others.

**Communication method** is a way of interacting, sharing or exchanging information – such as interpersonal, mediated or mass communication. For each method, a number of communication channels can be used or combined.

**Communication channels (or media)** refer to any medium through which a message is conveyed to reach the intended stakeholders and establish with them a two-way communication process.

These can be classified as folk or traditional media, community media, mainstream or mass media, information and communication technologies (ICTs) and social media.

**Multi-media mix** is a combination of two or more different types of communication channels to enhance the effectiveness of a Communication development strategy.

### **Content abstract**

**Section 1** acts as a guide through the various steps to follow in Communication development strategy design, a participatory and bottom-up process. It provides a whole range of tips and examples on:

- selection of key issues to be addressed;
- identification and profiling of priority stakeholders;
- formulation of Communication development objectives;
- choice or combination of appropriate communication approaches; • identification of core content;
- media selection.

**Section 2** looks into the array of communication channels that may be used in communication development initiatives, briefly presenting their characteristics, potential and limitations. It also explains the value added of a thoughtful and creative multi-media mix.

**Section 3** discusses and brings together all the elements that constitute the strategy and plan of action of a Communication development initiative. Examples and templates are provided for easy understanding.

### **Learning objectives**

After going through this module, the reader should be able to:

1. Explain what makes the Communication development strategy design a bottom-up process.
2. Use the findings of the communication appraisal as a guide for:
  - selecting the communication entry points;
  - identifying and profiling priority stakeholders;
  - setting stakeholder-oriented, workable communication objectives;
  - choosing appropriate communication approaches;



- identifying the core content of the Communication development strategy;
  - selecting appropriate communication methods and media, or a combination of them.
3. Design a full-fledged Communication development strategy.
  4. Outline a plan of action to specify major activities, outputs and resources required to achieve the strategic Communication development objectives.

### **Participatory communication strategy design**

Participatory communication strategy design (PCSD) is a bottom-up process that builds on the views and perspectives of local stakeholders, to come up with a communication response that meets their needs, fits their culture and is applicable to their situation. As a socially inclusive process, it involves collaborative decision-making between community members, subject matter specialists, local leaders, government officials, project staff and management, local media and institutions.

To a large extent, the Communication development strategy is shaped by the background information gathered during the participatory communication appraisal. It is therefore important to analyze the data collected with stakeholders during the assessment, and transform it into usable accounts. Communication development professionals use dialogue and negotiations to facilitate the acknowledgment of differences and common ground, and to reconcile the various views on a topic or issue. This careful diagnosis is later combined with the logical process of problem solving and creative thinking.

Preliminary situation analysis helps clarify the project rationale and purpose as a framework for the communication strategy. Relevant information can be derived about key development issues or opportunities existing in the area of intervention as well as related policies, programmes and organizations. The field PRCA then reveals stakeholders' characteristics, needs, opportunities, problems and possible solutions, as identified and defined by them, as well as local communication resources and social networks (e.g. information sources, preferred channels, opinion leaders).

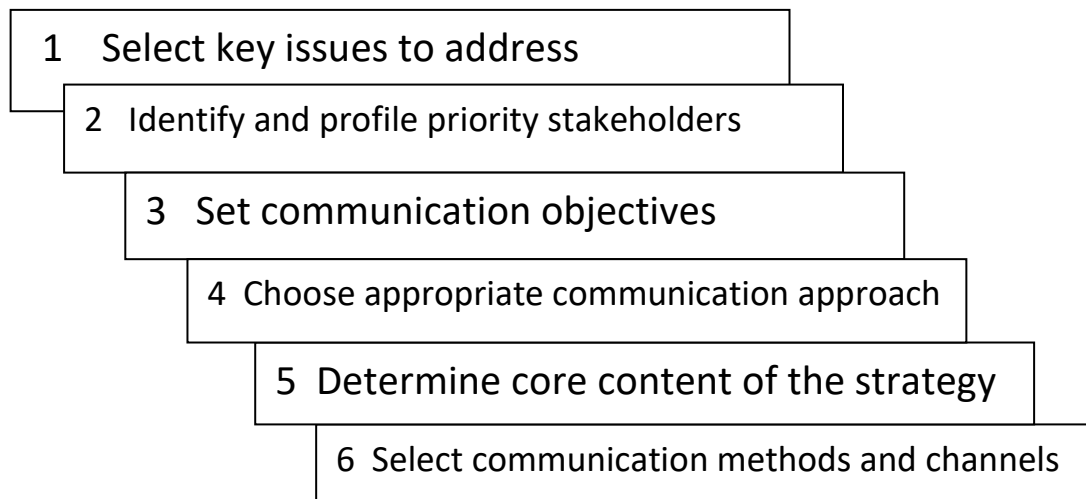
So, what particular data sets of the communication appraisal are relevant for Communication development strategy design? As illustrated in Figure, the review should especially focus on data that reflect local views and perspectives about:

- communication entry points to address local development priorities;
- priority stakeholder groups and their characteristics;

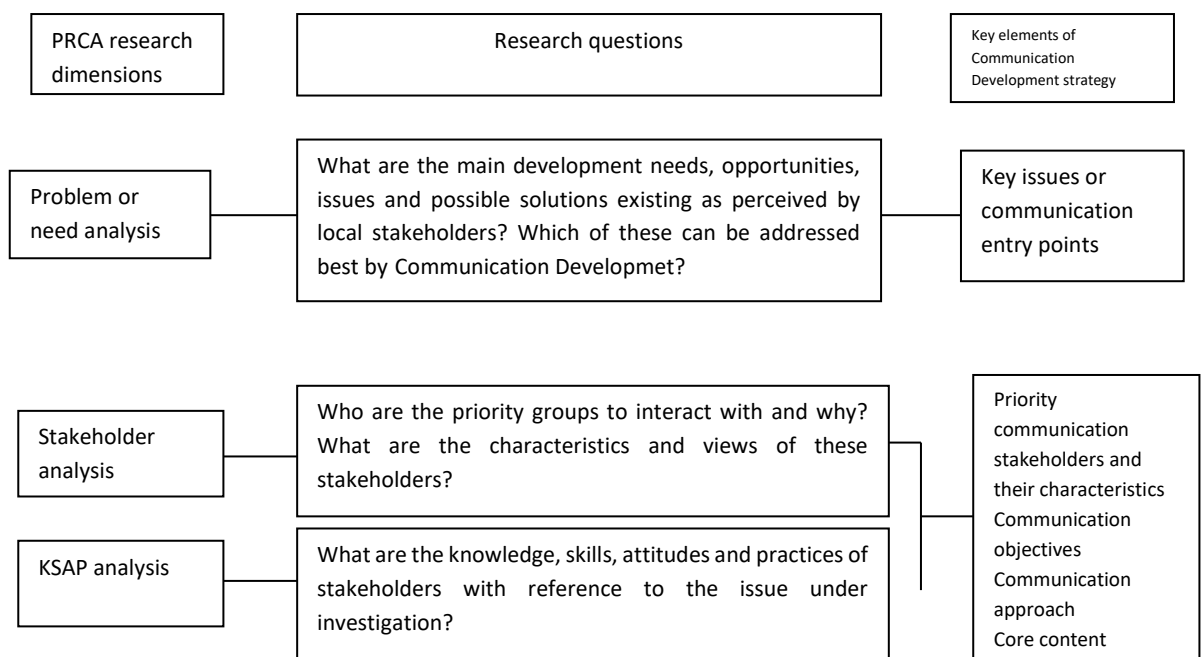
- stakeholder knowledge, skills, attitude and practice (KSAP) about the given issues;
- communication systems, resources, channels available in the community;
- social networks influencing power structures and knowledge flows.

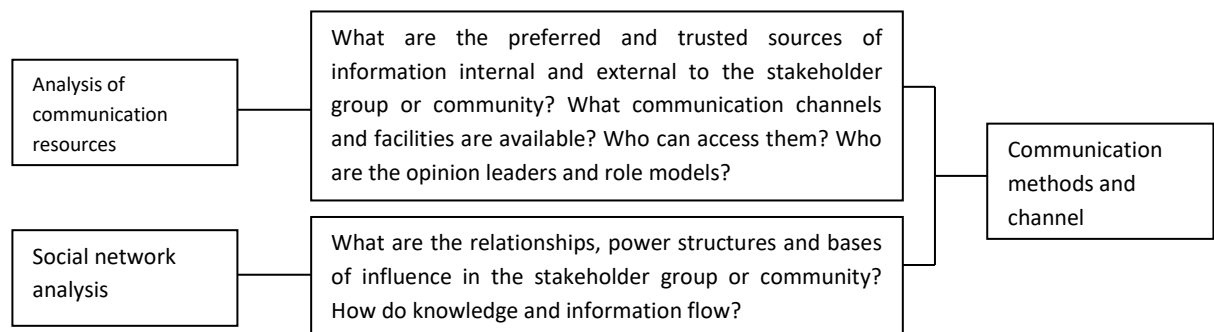
The methodology for communication strategy design follows six major steps that are shown in Figure below:

### Steps in Communication development strategy design



### PRCA findings relevant for strategy design





### 10.7.1 Selecting key issues to address

What problems or issues do project stakeholders consider to resolve through a Communication development intervention? What are the gaps between the ideal situation (what the project aims to achieve) and the current situation of the stakeholder group or community? Such gaps, also called communication entry points, will emerge from situation analysis and from the information collected during the PRCA through focus group discussions, key informant interviews and problem tree analysis. Module 2 of this sourcebook presents how to detect communication-related issues at the beginning or in the course of a development project and later validate and prioritize those potential entry points with the intended communication stakeholders.

### 10.7.2 Identifying and profiling priority stakeholders

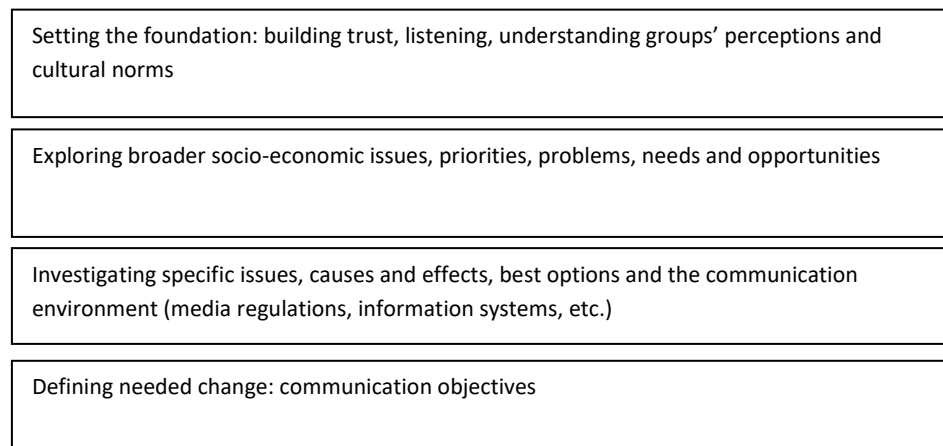
Stakeholders constitute an important component of the Communication development strategy, whose success partially depends on understanding who exactly should be involved. The more familiar one is with the stakeholder groups, the easier it will be to design specific communication activities, services or messages which fit in with their characteristics. This will help avoid the risk of using inappropriate approaches, contents or channels. Stakeholder segmentation, profiling and prioritization are part of stakeholder analysis, usually done during the PRCA.

Another key attribute of stakeholders is constituted by their knowledge, skills, attitudes and practices (KSAP). The results of KSAP analysis will give an idea of what stakeholders currently know, what skills they possess, how they feel and what they do in relation to a development concern, a new practice, technology or livelihood programme.

### 10.7.3 Setting communication objectives

Once the key communication entry points and the priority stakeholder groups have been identified, the next step is setting the communication objectives. These will be the basis to determine the rough core content of the Communication development strategy and to select communication methods and channels. Also, the objectives will provide targets for evaluation of the Communication development initiative. The diagram in Figure below illustrates how the Communication development planning process starts wide, with the participatory communication appraisal, and then narrows down with the strategy design to define specific communication objectives necessary to achieve successful change and programme sustainability. The communication objectives should indicate what kind of change is required to meet the stakeholders' needs and priorities. Characteristics and profiles of the stakeholder groups should also be considered in the formulation, as these affect the level of attainment of the objectives.

### **The funnel approach to objective setting**



Communication development objectives are often stated and measured in terms of changes in knowledge, skills, attitudes and practices (KSAP).

It should be noted that the objectives reflect the content or focus of the communication activities that will be implemented with each stakeholder group. For example, if a group of stakeholders is already pushing for the desired changes, the communication activities should be providing supporting messages. If, on the other hand, the intended stakeholders are doing nothing to address an issue, then they should be encouraged to acknowledge the negative consequences deriving from their current practices, and strongly motivated to take action towards change.

Grounded on a proper identification of issues and stakeholders, the objectives of the Communication development strategy are easily developed if guided by the following tips: 1. **Write from the stakeholders' perspective** – they are the ones who drive the change.

2. **Observe the SBCD pattern** – indicate the stakeholder group, the behaviour desired, the condition under which the desired change is to take place, and finally the expected degree of success.

3. **Write objectives that are SMART** – simple, measurable, achievable, realistic and time-bound.

### **Stakeholder orientation**

In Communication development, the strategy and plan are formulated from the stakeholders' perspective: this also applies to objective setting. Communication development goals should properly specify and emphasize the desired changes to be achieved with and by the stakeholders themselves. It is thus important to use their point of view, instead of the project implementers' perspective, when phrasing and setting indicators for measuring success.

### **SBCD Elements**

A good communication objective should contain the four SBCD elements: S = Stakeholder (a single intended group of stakeholders) B = Behaviour (action or change desired) C = Conditions (time, place, situation) under which the desired change should occur D = Degree (extent or measure) of success.

### **SMART principle**

When writing a good communication objective, the following basic characteristics should be kept in mind:

S = Simple

M= Measurable

A= Achievable

R= Realistic

T= Time bound

#### **10.7.4 Choosing the appropriate communication approach**

The communication approach is “a specific communication focus, or set of coherent tactical actions, aimed at achieving a certain objective”. Communication approaches overlap to some extent but are not mutually exclusive. Each puts emphasis on a specific element of the strategy (e.g. intended

stakeholders, objectives to accomplish, core content or communication methods to apply). Examples include information and knowledge sharing, social marketing, awareness raising, behaviour change communication, social or community mobilization, edutainment and advocacy communication, among others. Aligned with the participatory nature of Communication development, major approaches aimed at the active engagement of communication stakeholders are discussed below:

### **Information and knowledge sharing**

Communication makes information available in forms that rural people find useful, relevant and attractive. Information and learning materials about new topics, technologies or practices are provided in styles and formats that people can easily comprehend. They can overcome literacy barriers through audio visual materials and reach specific audiences more effectively (through either interpersonal or group communication, mass media or new ICTs). Communication development also strengthens knowledge sharing mechanisms to improve local capacities, and bridge the gap between local or indigenous knowledge and scientific knowledge. With information and facts at hand, people are able to make informed choices between adoption and rejection of a new idea, practice or technology.

### **Awareness Raising**

Awareness raising is a key approach in communication for development. It serves to promote the visibility and credibility of a topic or issue and increase general understanding. For example, emerging issues such as climate change need specific communication efforts to raise levels of public awareness and understanding of its causes, effects and possible solutions. Awareness raising is constructive and can lead to positive changes in people's perceptions, attitudes, belief and actions.

### **Social mobilization**

In simple words, social mobilization calls for the establishment of a broad-base demand, support and action towards a development goal. Networking, partnership and alliance building are key components of social mobilization, strategic to create consensus and promote resource sharing and synergy of efforts. The actors involved include community members and other relevant segments of the society such as decision makers, religious associations, professional groups, opinion leaders and service providers. Allies can come from NGOs, church based and non-profit organizations, the

private business sector, academe, research institutes and development organizations. In this approach, Communication development fulfills its function of increasing rural communities' readiness for collective action. It is an intensive process of awakening critical consciousness and developing leadership capabilities, to get organized and tackle an issue. When communication is used to trigger active participation and networking, the outcome is often successful and sustainable, as people feel more committed and strive to ensure effective implementation of plans they personally contributed to. In a way, it is a process of empowering local communities and encouraging self-reliance.

The social mobilization approach is exemplified by the National Greening Programme (NGP) of the Philippines illustrated throughout this module. The NGP communication strategy focuses on mobilizing government employees, students and private organizations – in addition to upland farmers – to play an active role in national efforts for environmental sustainability, by planting and taking care of tree seedlings.

### **Advocacy**

Advocacy is communication directed at political, business, and social leaders, at national or local levels, who should take action to support project or programme objectives. Its main purpose is to promote and influence change at the public or policy level, for instance in the form of legal reform or enactment of new laws, policy decisions and formulation, administrative directives, resource mobilization and financial allocation. Communication development uses participatory techniques, methods and tools to give rural people the means to articulate their opinions and voice their needs. In this sense, communication can play an intermediary role contributing towards a more inclusive and people-oriented policy environment. By strengthening and presenting rural voices in ways the decision-makers understand, and vice versa by making relevant information accessible to even the most remote or marginalized communities, communication helps facilitate policy dialogue and negotiation.

#### **10.7.5 Identifying the core content of the Communication development strategy**

According to OECD (1999), the content of any communication strategy will have greater chance for success if the information is: (a) accessible; (b) accurate; (c) verifiable; (d) complete; (e) timely; and (f) relevant. Once the objectives have been set and the communication approach selected, it will be easier to delimit the core content of the Communication development strategy, keeping in consideration the results of PRCA and in particular KSAP analysis. Again, to ensure soundness and

relevance, this process of content identification should be done in a participatory way, involving both local communities and technicians.

#### **10.7.6 Selecting communication methods and channels**

The final step in designing a Communication development strategy is to think about the channels through which the intended stakeholders can be reached and engaged with, in fruitful, two-way communication. An error in rural development projects would be to distribute printed materials like brochures and pamphlets, only to find that they cannot be read by local people; or that their preferred sources of information about agricultural issues are fellow farmers and radio. Despite the fact that radio is generally more expensive than print or visual materials, if the per capita cost involved is calculated, the air time could turn out to be much cheaper. A good media selection serves to maximize impact and cost-effectiveness.

Mediated communication is increasingly being used as a result of farmers' and rural people's growing access to ICTs, particularly mobile phones. However, media selection depends first and foremost on the communication objectives formulated for the strategy. Different types of communication methods and channels fulfill different objectives. For example, mass communication through mainstream radio, television and newspapers has proved to be more effective in creating awareness, advocating or providing information about an issue, idea or innovation. On the other hand, community-based projects in rural areas generally make use of group and individual interpersonal communication which are appropriate to stimulate debate, interaction and collective learning processes.

#### **10.8 Challenges to Rural Communication**

The situation concerning communication in rural areas of developing countries is characterized by:

- 1 A dearth of information (absence of providers and of local communication content);
- 2 Conflicting messages (difficult to know what is relevant/correct information);
- 3 A fragmented market for information with many individual clients or client groups;
- 4 Relatively few clients scattered over a large area;
- 5 Structural transformations leading to constantly changing channels and content and a lack of the necessary skills for communication; and



6 A lack of well-developed ICT infrastructure and low levels of ICT skills.

In rural areas, communication needs and available channels are facing tremendous changes through structural transformations: subsistence oriented farming remains the basis for food security especially in disadvantaged areas, while there is a general shift to move intermediate farmers into market-oriented production. Market-oriented farmers need to stay competitive in an increasingly global business environment. While agriculture remains the mainstay for rural people, information and skills for alternative livelihoods gain in importance, not only as an exit strategy, but also for the increasing division of labour. Each of these groups of farmers has specific communication needs and capacities for innovation, management and finance. However, client/demand-oriented service provision for innovation, information, qualification and local organizational development remains the key driver. Ongoing decentralisation of government functions and services improve the prospects of local political decision making. These reform processes and their opportunities and consequences need to be communicated properly to rural people. Lobbying by organized groups, as a form of communication to politicians, becomes a necessary activity to voice rural interests. On the other side, efforts to close the information gap and, in particular, the digital divide in rural areas, have been supported by the wider availability and accessibility of communication technologies and infrastructures, like internet, rural radio and mobile phones.

Strategies that include communication for rural development as a significant aspect of agricultural and rural development are sorely needed. Efforts in this direction are being made, but governments have yet to recognize fully the potential of this factor in promoting public awareness and information on agricultural innovations, as well as on the planning and development of small business, not to mention employment opportunities and basic news about health, education and other factors of concern to rural populations, particularly those seeking to improve their livelihoods and thereby enhance the quality of their lives.

Rural development is often discussed together with agricultural development and agricultural extension. In fact "agricultural extension" is often termed "rural extension" in the literature. In contrast, rural development includes but nonetheless expands beyond the confines of agriculture, and furthermore requires and also involves developments other than agriculture. Accordingly, government should consider the establishment of a communication policy that while supporting agricultural extension for rural development also assumes the role of a "rural extension" service aimed as well at diffusing non-agricultural information and advice to people in rural areas.

Over the last 25 years, we have been involved in developing campaigns for a variety of products ranging from agri-inputs such as fertilisers, agro chemicals and seeds, to consumer durables, FMCG and the services sector. This has helped us understand the special characteristics of the rural audience. Some insights:

A rural consumer may be illiterate according to the Census definition, but he is very clever, blessed with a lot of common sense. He is highly conscious of value for money.

There is a high involvement of the rural customer in any product purchase, more so for high-end products, which involve shelling out a few thousand rupees or more.

Tricky, clever, gimmicky or even suggestive advertising does not work with the rural audience. 'Slice of life' approaches, simple and direct, using inspirational urban-looking models work very well. Combining education with entertainment or 'edutainment' is a good route to take.

Companies will do well to use regional stars for regional campaigns for more effective penetration of brands in rural areas.

In case of television spots which are sophisticated in execution and chances of the message going over the heads of the rural consumers' high, special efforts will have to be made to interpret the main message to the rural audience. This could be done through a whole lot of below-the-line (BTL) activities, including road shows and VOW (video on wheels) programmes, which elaborate on the theme of the campaign through interactive games and contests.

It is clear that in any form of rural communication, while we may have a national strategy, we have to think and act locally. An integrated package consisting of mass media and below-the-line activities works well.

### **10.9 Communication Delivery Strategy**

The two vital arms of rural communication are the development of creative to suit specific target audiences and communication delivery using appropriate vehicles.

Though rural folks receive all types of selling messages through multiple sources, it has been found that the two-tier system — opinion leaders and the masses — continues to exist. Opinion leaders continue to play an important role in the decision-making, which is still community or group-based.

However, the composition of the opinion leaders has changed over a period of time.

For decisions regarding farm inputs, farmers may consult the traditional opinion leaders, including other successful farmers, agricultural officers and dealers. But with the growing aspiration levels

(thanks to television), village youth who go to the cities for education and employment have also become important opinion leaders for lifestyle products. And in the case of personal care products, similar to the trend in the urban areas, school-going children do influence the brand decision. Kids' pester power is not unique to urban India.

### **10.10 Media Strategy for FMCG Products**

Television is invariably the primary medium used by most FMCG brands. As television does not distinguish between urban and rural, whether one likes it or not, the commercials are also exposed to a vast majority of the rural audiences.

If a company is clear that a particular brand can be targeted at both urban and rural audiences, and since television is already considered the primary medium, it might be a good idea to produce commercials that appeal to both urban and rural audiences. Pre-testing of such commercials among both audiences is vital to ensure success among both.

Apart from regional TV channels, one can consider the use of local cable TV networks largely telecasting local shows popular among communities in semi-urban and rural areas. Rural cinemas, especially in South India, are still a popular medium to reach consumers.

Radio is one of the cheapest mass media to reach rural masses. Even where electricity is unreliable, transistor radios are very popular among the poorer sections of rural India. With the number of FM stations set to explode after expansion under Phase Three, it would be possible to reach even more remote areas through radio.

*Haats* (weekly markets) and *melas* tied to temple and religious festivals are great for promoting brands. While *haats* help in reaching a few thousand villagers from different villages in one place, *melas* attract lakhs of visitors across the State or across the country as in *kumbh melas*. They offer a variety of media opportunities in one place. However, it must be remembered that *haats* are gradually losing their importance in economically developed markets such as Tamil Nadu because of the tremendous progress made by small towns and their easy accessibility to villagers due to better and reliable transport facilities.

In the last couple of years, the role of technology has made a huge difference in the way one reaches the rural audience. The growing number of Internet kiosks disseminating useful information to village folk has come to stay. The mindboggling growth of mobile telephones, especially in the rural areas, has created a great opportunity for anyone with a message to reach the rural masses.

Sitting at home and at the press of a button, a rural customer is able to access all kinds of information — in the process virtually helping the elimination of the middlemen, who have had a stranglehold on him for generations. But this is still an evolving medium.

Static media such as wall paintings, hoardings, shop fronts and point of sale continue to be useful as reminder media. So are messages prominently displayed in bus stands, railway stations, on water tanks, wells and pump-sets in villages, as well as mobile media such as local buses and auto-rickshaws.

### **10.11 Media Strategy for Consumer Durables/Services**

High-end products such as consumer durables or the service sector call for a two-pronged strategy, covering above-the-line and BTL activities.

While mass media helps create awareness about the brands, it has been found necessary to have BTL activities or road-shows as part of direct marketing efforts aimed at specific target audiences.

Since the opinion leaders can be easily identified in each village, and they are small in number, direct marketing efforts aimed at opinion leaders must always precede any effort aimed at larger audiences.

This becomes even more important for sectors such as banking and insurance, which need concept selling before specific brands are promoted.

And to provide opportunities for demonstration and 'touch and feel' of high-end consumer durables, vehicles or services, it is important to have a well-conceived and executed BTL campaign, ensuring that the communication messages used, integrate well with the mass media campaign.

#### **Questions:**

1. Define communication channels which are using in rural management? List out the types of media and their characteristics?
2. Discuss the uses of communication channel for rural development?
3. Which communication strategies are used for rural management? How you can formulate communication development strategy for rural management?
4. List out the Challenges to rural communication? Write down media strategy for FMCG Products and Consumer Durables/Services?

### **Suggested Readings**

- Katar Singh(2009), Rural Development: Principles, Policies and Management, SAGE Publications India Pvt. Ltd. Publication year: 2009.
- H. D. Foth & I. M. Turk, Fundamentals of Soil Science, Wiley Eastern.
- R. Saravanan, (1 January 2011), Information and Communication Technology for Agriculture and Rural Development, New India Publishing Agency

**CERTIFICATE COURSE IN RURAL MANAGEMENT**

## **COURSE: RURAL MANAGEMENT**

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### **UNIT 11: MEDIA MIX FOR RURAL DEVELOPMENT - AUDIO – VISUAL AIDS IN PROPER SEQUENCE, CROSS-MEDIA APPROACH IN RURAL DEVELOPMENT, MEDIA FORUMS, USING OF SOCIAL MEDIA FOR RURAL MANAGEMENT**

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#### **STRUCTURE**

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**Questions**

**Suggested Readings**

## **11.0 Objectives**

1. Have a clear understanding about different types of traditional media and their role in rural development,
2. Distinguish and understand various types of visual aids, audio aids and audio-visual aids and their role in rural development.
3. Appreciate relevance and importance of combination of various media for effective communication in rural development.
4. Have a basic understanding of emerging electronic technology for communication in rural development.
5. Explanation and clarification of Internet media marketing concept and the main types of it.
6. Explanation of the role and functions of Internet media marketing.

## **Media Mix for Rural Development - Audio – Visual Aids in Proper Sequence**

### **11.1 Introduction**

The attention of people is attracted by various senses in the proportions of: seeing - 87.0%; hearing - 7.0%; smell- 3.5 %; touch -1.5 % ; and, taste -1.0 %. Thus, seeing and hearing are the major senses involved to attract attention and increase learning. “If I hear – I forget If I see – I remember If I do – I know” - An old Chinese proverb ‘Seeing is believing’ - Famous extension quote ‘The best way to peoples’ heart is through their stomach, but the best way to their brain is through their eyes and ears’ - An old proverb Audio visual aids are instructional devices in which the message can be heard and seen simultaneously Examples: television, video films, documentary films, etc. Audio visual aids help in stimulating the ears and eyes. Hence, in the strict sense a teaching aid is any device that can be used to help reinforce new information or skills. Instructional aids are devices that assist an instructor in the teaching-learning process. Instructional aids are not self-supporting - they are supplementary teaching devices. What do the above proverbs, definitions, and discussion suggest to you? They suggest that, hearing alone is not enough, in the learning process, to result in action. The use of audio visual aids in extension teaching is based on the principle that one must see and try to do, along with hearing, in order to go through all the six steps in the extension teaching learning process.

Before going into the types of audio-visual aids available to the planner, we must both define and limit our use of the basic term itself.

Audio-visual is, of course, a combination of two words: *audio* referring to that which we can hear, and *visual* referring to that which we can see. The basic frame of reference here limits our



application of the term to a speaker and his audience, although they are not necessarily in the physical presence of one another, as in the case of a motion picture or television presentation.

The term "aids," used in reference to the speaker, rules out his physical presence (visual) and unrecorded voice (audio). These are the essential elements which make him a speaker, and therefore cannot aid him (his voice cannot aid his voice).

Further, the uncontrollable physical surroundings are not audio-visual aids in themselves, although they can have a definite audio or visual effect and should therefore be considered, if possible, when preparing a presentation. These include such things as distracting street noises (a hindrance) or a soundproofed room (an aid); or a beautiful mural behind the speaker (a distraction), purple and orange walls (a hindrance), or a paneled, modern meeting room with indirect lighting (an aid).

Handouts, especially maps, charts or tables, make good visual aids. The audience, particularly a large one, can get a finer appreciation of details which cannot be enlarged in a suitable manner. However, the audience is left in a position to continue studying such material, both before and after the speaker refers to it, and thus he cannot "control" its use.

We are left, then, with audio-visual aids which the speaker can control, and which are suitable for use with audiences of widely varying sizes.

## **11.2 Audio-Visual Aids**

The term "audio-visual aids" is commonly misapplied. The aids themselves must be something either audible or visual, or both. The common types of audible aids are the spoken word, recognizable sound effects, and music. The most frequently used visual aids are people, pictures, cartoons, graphics, maps, the printed word, and three-dimensional models. When we talk about a motion picture projector or a blackboard, we are talking about the means of presenting the aids, and not the aids themselves.

Audio-visual materials can be divided into those which present the aids in their original form, and those which reproduce the original form.

In the following paragraphs, we will briefly define the most common means of display which make sights and sounds useable in the speaker-audience situation outlined above. They will be discussed in further detail in later chapters.

## **Visual Aid Display Equipment**

Animation. Movement may be given to different types of visual aids. The materials necessary to do so fall in this section, but since they are usually improvised they cannot be specifically defined. Examples are given later in this report.

Blackboard. Black, green or other colored slate or composition board, or a specially painted surface which will "take" erasable white or colored chalk.

Bulletin Board. Flat board of cork, composition or other wood or material to which visual aids may be attached with pins, tacks or staples.

*Easel or A-frame.* Any type of frame which will hold flat-surfaced visual aids of any given size; characterized by the artist's easel, which is similar in structure to the letter "A," with a third leg used as a brace.

Feltboard. Any stiff, flat board covered with wool, felt or flannel. A variety of visual aids, usually cutouts of objects or strips of cardboard lettered with key words, with sandpaper or other abrasive backing, will adhere to the board. The same effect can be achieved by backing the visual aids with two-sided cellophane or masking tape, and covering the board with a piece of acetate; or by using strips of Velcro.

Flash Cards. A series of stiff cards, usually small enough to be held in the hands, each of which is imprinted with one or more key words.

Flip Charts. A series of visual aids on flexible paper, fastened together at the top and mounted on a frame in such a manner that they can be flipped or folded back. The frame usually resembles a football goal post, with the charts fastened to the crosspiece.

Model or Mock-up. A three-dimensional dummy, usually made to a small scale, which may or may not have working parts. The finished model is a visual aid. We are concerned here with construction materials.

Pegboard. Composition or plywood board, or other similar material, which has holes drilled through it at regular intervals, usually 3/4". Different types of metal clips, fitting the holes, will hold visual aids such as small posters, books and models.

Pointer. Any long, thin strip of material, such as a stick, ruler, etc., which may be used to indicate parts of the visual aid being emphasized. One new model contains a battery-powered flash light, with a beam shaped like a small arrow. The pointer can be used to indicate a portion of a slide, projected in a darkened room, without having the pointer's shadow fall on the screen.

### **11.3 Original Audio Materials**

As was mentioned earlier, audible aids generally include the spoken word, recognizable sound effects, and music. The materials thus include people, anything which will produce a desired sound effect, and musical instruments. Sound reproduction equipment, if sound is to be used, becomes a necessity in many cases.

It might be inconvenient, for example, to recreate the din of downtown traffic, in its original form, within a small meeting room. A little library research on theatrical sound effects may be helpful.

### **11.4 Visual Projection Equipment**

All visual projection equipment, with the exception of mirrors, the earliest "magic lanterns" and viewing screens, requires electricity to power its lighting elements. There are five basic types of modern equipment.

*Filmstrip Projector.* Equipment which will advance and project a 35 mm. filmstrip, one frame at a time.

*Motion Picture Projector.* Equipment which will project a series of pictures on a strip of film in such rapid succession as to give the appearance of movement to objects.

*Opaque Projector.* Equipment which will project the image of any opaque material, either flat or three-dimensional, placed beneath its lens.

*Overhead Projector.* Equipment which will project the image contained on transparent slides up to 10" X 10". Each transparency must be positioned on the projector by hand. The word "overhead" is taken from the design of the equipment, which actually projects the image to a mirror held above the transparency, which in turn reflects it over the head of the speaker to the viewing surface.

*Slide Projector.* Equipment which will project the image contained on a small transparent slide, usually 35 mm. (2" x 2" when framed). Many of these projectors are equipped with magazines to hold a large number of slides, and operation can be either manual or automatic.

All visual reproduction equipment requires a viewing surface of some type. Screens are discussed in a later chapter, in reference to the capabilities and limitations of the different pieces of equipment.

### **11.5 Audio Reproduction Equipment**

The types of sound reproduction equipment are fewer in number than those for visual projection. They are:

*Phonograph.* Equipment which will reproduce sounds recorded or transcribed in grooves in the surface of a hard, round, flat record.

*Sound Motion Picture Projector.* A film projector which also has equipment for reproducing sounds recorded along the edge of the film itself.

*Tape Recorder.* Equipment which will reproduce sounds recorded on a rolled tape. Most tape recorders can be used to place the sound on the tape, as well as reproduce it.

In addition to being used as a separate piece of audio equipment, phonograph records are also used in conjunction with filmstrips. The result is known as a sound slidefilm, sound having been added to a group of slides put together to make a film. A sound signal, either audible or inaudible, placed at intervals on the record, advances the filmstrip. The synchronized equipment is known as a *Sound Slide film Projector*.

### **Other Useful Terms**

In these few pages, we have already presumed an understanding of some terms with which the average planner may not be familiar. These, and other terms which are used later in the report, are defined briefly below.

*Film.* (Used in the text as processed movie film.) A long, narrow strip of cellulose nitrate, acetate or similar material containing a succession of small transparent photographs. Common sizes are 8 and 16 millimeter, referring to the width of the strip.

*Filmstrip.* Same as Film, but usually in 35 mm. A filmstrip is usually compiled from a number of individual pictures taken with a 35 mm. still camera.

*Graphics.* Diagrammatic representation of numbers, taking several common forms such as the bar chart, line graph, or pie diagram; or a charting, such as an organization chart, flow chart, etc. Pictures are sometimes used, particularly in bar and flow charts.

*Montage.* A composite picture made by combining different elements. These may include photographs, lettering, magazine covers, etc.

*Opaque.* Possessing a thickness or density which prevents light from passing through the object. Total opacity is not necessary for the use of the opaque projector.

*Slide film.* See Filmstrip. The term slide film is used only when sound is added.

*Tape.* (Used in the text in reference to tape recordings.) A narrow strip of acetate or other material, somewhat similar to film, on which sound may be electronically recorded or transcribed.

*Transparent.* Opposite of Opaque. That through which light can pass.

*Transparency.* A picture viewed by having light shine through it.

### **11.6 Some Principles for Use of A-V Aids**

Thus far we have suggested that audio-visual aids are a valuable tool for the planner, and we have briefly defined audio-visual aids and the more important pieces of audio-visual equipment. Now, before going into the choice of a means for displaying the aids for a particular talk, we must discuss the selection of the aids themselves.

The illustration, both audio and visual, of a talk is similar to the illustration of a printed report. The process generally follows these steps:

1. There must be a goal or purpose for preparing the report (speech).
2. An outline of the finished product is prepared, to be used at this point as a guide to the research.
3. Research is completed, as necessary. If the research includes the compilation of data or map studies, these may be bases for illustrations.
4. The final report (speech) is written.
5. Illustrations are added to
  - a. Support statements.
  - b. Graphically depict key points.
  - c. Enhance the appearance of the report (speech).
  - d. Add a touch of humour.
  - e. Add emotional impact.
  - f. Condense and simplify statistical material.

In one sense an audio-visual presentation, with the audio presented "live" and the visual projected on a screen, is similar to an old-time vaudeville act with two men on the stage, the straight man and the so-called comedian. On some lines the straight man will move to stage centre and project loudly, and on the next lines the comedian will stride over the footlights and give the punch line. With sharp, crisp dialogue and byplay, they hold their audience's interest. Of course the planner does not do a song and dance act when using audio-visual tools. But a certain amount of showmanship and enthusiasm, as well as pacing and timing, can make a presentation more effective. A visual aid

carries the impact one time; then the planner steps forth to point out a key fact related to the illustration.

The steps outlined above, and the mention of pacing and timing, connote a principle of illustration which is inherent to the definition of a planner — preplanning. Pre-planning begins with the statement of a goal or goals of a specific project, and takes form through the preparation of an outline. Adequate pre-planning implies continuity of thought, and a certain amount of simplicity of content, obtained via a step-by-step analysis of several propositions leading the reader to a conclusion. If the report has continuity, then illustrations, assuming they are used to illustrate the consecutive key points of the report, will have continuity. Pre-planning ends with a final review of the report prior to publication or, in our case, with rehearsal of a presentation prior to its formal delivery.

Simplicity cannot be overstressed. The goals must be simplified. The outline must be simplified. Research must be simplified. The written report must be simplified. Illustrations must be simplified. And, through rehearsal, the delivery of the presentation must be simplified. Very few audiences have a technical knowledge of planning, and more particularly of the planning vocabulary. In order to "sell" a plan, every word, every phrase, every illustration must be geared to the capacity of the audience to understand the planner's exact meaning. The following principles are intended to help the planner analyze his presentation.

### **Spacing**

Illustrations should be spaced throughout the speech. This may not always be possible, but should be a goal. If it is necessary to bunch the illustrations at one point, try to make it as near to the end as possible. No matter how good the speaker, he cannot "follow" visual material and maintain the same degree of interest.

Illustrations should always pertain to the immediate material being discussed. The confusion and frustration caused by inappropriate timing is frequently displayed in written material where the text refers to a table or other material on another page. Obviously, the further the illustration is from the text reference, the greater the degree of apathy or even hostility on the part of the reader. Just as the ideal publication shows an illustration on the same page as and alongside the text reference, the speaker should show his visual aids only at the time he refers to them. Turning the page of a book removes the possibility of a previous illustration becoming a distraction from the subsequent text. The same principle applies to visual or audio aids for a speech. Repeat the use of an aid as needed, but do not leave it in view at all times.

Now we come to what appears on the surface to be a contradiction. Despite the principle of spacing, the use of a large number of illustrations in the opening moments of a talk is frequently effective. The rapid use of visual aids, particularly photographs, will create an immediate interest on the part of the audience. In reality, the principle of spacing is still being used: the rapid succession of photos amounts to a montage, and can be considered as one illustration used to define the scope of the talk. Subsequent illustrations will remain in view for a much longer period of time, on an individual basis, and therefore the total viewing time of the opening montage can be compared with that of any of the other visual aids when determining spacing.

### **11.7 Technical Material and Maps**

Technical subject matter should be avoided or translated into simple or understandable language or demonstration. Since most . . . [presentations] will be for local consumption, one should not hesitate to refer specifically to local situations, locations, or problems which are generally recognized.

People are bored by statistics. The planner knows this, and yet figures frequently make up the bulk of his talk. The first step, then, is to eliminate all unnecessary statistics, considering primarily the listeners and what they want and need to know.

The use of graphics cannot be stressed too heavily. Numbers, in addition to boring even those who understand them, are completely incomprehensible to a surprisingly large percentage of the average audience. People need something they can see, something they can compare. Graphics provide this visual comparison. The addition of a third dimension, identification, can make the graphics completely successful. The problem, which is not always easy to solve, is to relate the statistics dealing with the planner's subject to statistics dealing with the audience.

For example, a line chart may depict the capital improvements expenditures during recent and future years, as scheduled by the planning department and approved by the city council. A little research would permit the planner to add lines depicting the increasing average personal income, average personal taxes (including real estate, personal property, excise, and so forth) and the amount or percentage of those taxes which will go toward the construction and maintenance of the capital improvements. Now the members of audience can identify themselves with the statistics: they know how much of their money is going into the planner's work. The statistics shown in the example above will be particularly effective if the percentage of personal income going to capital improvements does not increase, and perhaps even decreases after completion of some major phases of the program.

We hear a lot about the manipulation of statistics. We certainly do not recommend that anything be hidden from the audience, for the responsibility of the planner is to the audience — the people for whom he is planning. But it might be advantageous to put extra effort into making certain statistics, which strongly support the planner's goals, more dynamic through the effective use of graphics. Increased costs cannot be disguised, but graphic comparison with the rival town across the river, which is spending more to get less, can sway public favour without resorting to any dishonesty. The greater the emotional appeal of the comparison, whether it stresses financial burden, civic pride or anything else, the greater will be the favourable response of the audience.

Maps and other complex illustrations must also be closely scrutinized.

While maps to the planner are essential tools, it must be realized that the average person, even with concentration has great difficulty in following very simple diagrams. A program that relies heavily on visual reference to maps or plans will not be too successful. This point should not be passed off lightly. An incomprehensible program may easily do more harm than good to the status of planning in the community. No show or publicity is better than a poor show or bad publicity.<sup>5</sup>

How is the planner expected to talk on his land use proposals without a map? He isn't. But it is extremely important for him to simplify his presentation as much as possible. Some of the proposed land use maps we have seen, using almost every variety of Ben-Day pattern or shading to depict infinitesimal areas, may be accurate, but they have about as much appeal to an audience as a medical textbook does to a planner. There are a few simple ways to make a land use map easier to follow:

1. If the use of colour is not practical, *eliminate or combine* as many of the use zones as possible, especially in an over-all map of the area. For example, the average member of a public audience will understand that an area of the map covered with vertical lines represents residential areas, without going into details of apartment and single-family areas.
2. If at all possible, *use colour*. Here again, simplify the map as much as possible. Solid areas of colour can be distinguished from the back row of the audience, but various patterns using the same colour become meaningless.
3. To illustrate the fact that higher density housing has been planned near the industrial areas, *use another map* depicting just those factors and areas. The *enlargement* of a small area of the over-all map will permit some different shading patterns or colours, since those used in other areas of the city will not appear on the enlargement to confuse the issue.



4. *Use overlays* to depict each type of land use, both as it currently exists and as it will be after the proposed changes. The use of the overlays will permit comparison of industry with housing, housing with parks or commercial areas, or the comparison of the proposed schools with those existing, or any other comparison which will illustrate the logic and reasonableness to be found in the new map, without the encumbrance of trying to distinguish between the areas under discussion and those which have no bearing on the problem.

These solutions to the presentation of a land use map can be applied to any other complex plan or illustration, since the key to understanding is simplification.

One last, but very important, factor in the simplification of maps is uniformity. Map colours have been standardized. Use the recommended shades. Above all, do not vary colours or symbols depicting the same thing from map to map. Nothing could be more confusing.

### **11.8 Build Anticipation — Then Deliver**

Picture yourself in your favourite chair, relaxing after a fine meal prepared by your beautiful and loving wife. You settle down to watch the television show of the year, one you have been waiting for with keen anticipation. Brigitte Cheesecake, European lovely, has finally consented to come to this country and is making her television debut in a comedy featuring the Three Stooges.

The show gets under way, and there she is. You are surprised that she proves to be a very good comedienne. She is holding her own in laugh-packed situation after situation, and the show is building toward its climax. Miss Cheesecake had hired the Stooges as butlers, and has been trying to teach them the etiquette necessary for the job.

This rather elaborate example has its parallel all too frequently in the presentations of planners. Through the use of some excellent visual aids, they build anticipation and keen interest . . . and then fail to deliver the climax they have led the audience to expect. Take the example of an imaginative presentation on what has been publicized as an exciting proposal for urban renewal. Some fine photography on the part of the planner has produced good illustrations of the current condition of the area, showing rotting porches, falling chimneys, broken sidewalks. But the artist hasn't finished the sketches of the proposed changes, so the planner attempts to describe them with words alone. The resulting enthusiasm is deafening in its silence.

Now let's go back to the TV set. Let's imagine that the tube didn't blow, and see what happened.

The Stooges trip and fall toward Miss Cheesecake. But with an effort, they manage to miss her, and the pies and cakes fall harmlessly to the floor. She immediately fires them, and they meekly leave the room.

Here we have a climax, but one which, in this case literally, falls flat on its face. Taking again our example of an urban renewal area, the same effect is often achieved by the planner who tries to cut corners by retouching the original slum photos, or presenting just a few rough sketches, rather than expending his greatest effort on the attractive display of the results which will be achieved by the adoption of his planning proposals.

The point, a basic principle of visual presentations, is obvious. The climax must at least equal, and preferably exceed, the visual impact of the introduction and explanation.

### **Negative to Positive**

The urban renewal example used above illustrates another principle of visual presentation.

In order to "sell" you have to explain — you have to make people see things. In your case you [the planner] must first make them see the existing negatives. You have to make them understand that blight in a city's body is cancerous — that it contaminates and destroys. . . . The first job of a selling program for city planning is to bring these bad conditions into the conscious mind — to expose them in the white glare of publicity and to interpret their infectious contamination of good areas, so it will become harder and harder for any intelligent citizen to pull down a mental curtain to block them out.

The second job of a selling program for the city planner is to portray the positive side — to whet the appetite — to make the people drool in anticipation of the benefits that a sound and imaginative plan will produce.

There is a great degree of overlap between the principles of anticipation-climax and negative-positive, the negative approach simply being a valuable tool in the building of anticipation, and the positive being the logical climax.

### **The Use of Humour**

Millions of words have been written about humour, and yet it is hard to define. It takes many forms, and varies with the situation. In a planner's presentation, humour has a definite place, but it is not so much to make people laugh as it is to maintain interest. Doing this requires that the humour, in whatever form, be related in some way to the subject matter. To be effective, it must amuse, relieve

the tension on serious consideration, and illustrate the point the planner is trying to make in a manner much more effective than cold facts or figures could achieve.

A satirical presentation, used perhaps to poke fun at the opposition's objections to a plan by showing their absurdity, will often backfire. Extreme care must be taken to avoid the impression of ridicule, particularly if the presentation will be given before a variety of groups.

A humorous simile, such as the one used above with Miss Cheesecake and the Three Stooges, makes use of a completely fictitious situation illustrating a common principle. Here we have, it is hoped, offended no one, amused a majority, and made the principle of anticipation-climax much more clearly understood, and thus better retained, than would the urban renewal example if left to carry the message by itself. Shown here in words, it gave a visual image; a camera or artist could put it in pictures to illustrate a presentation.

Animals, babies and cartoon characters can be used to add an effective touch of humour. Cartoons in particular are often used to add continuity. The recurrence of a comical little man, perhaps added to the foreground of each illustration and doing nothing more than studying the same material the audience sees, can lighten the serious atmosphere of a meeting. The audience will look to see what the man is doing in each illustration before looking at the actual content. This split second of relaxation, repeated throughout the presentation, relieves boredom and monotony.

Animals and babies are particularly useful when used to illustrate action or attitude. A kangaroo might be used to show how people should "jump" on the bandwagon and get behind a project, or a fat, sleeping and obviously contented baby might illustrate previous public apathy about current renewal problems. Other examples are given later in this report.

### **The Speaker and Assistants**

Although we have stated that the speaker is neither an audio nor a visual aid to himself, his audible and visual impact upon an audience is more important than the finest aids. Since the same things which apply to the speaker apply to any assistants he may have, particularly in a panel presentation, we should devote at least a few words to them.

Voice qualities are also important. The man with a high-pitched voice may overcome this drawback by displaying a likeable personality, competence and intense interest. But it is generally agreed that the man with a pleasing voice has a head start on success in public speaking. A planner studies English before he attempts to write. He researches his subject before he draws conclusions. Let us assume then, for the sake of brevity, that he has also studied speech and knows of the tricks and tools necessary to overcome any vocal shortcomings.

An outstanding personality might carry a show that would otherwise have little appeal. A one-person show demands someone who can attract and hold an audience aside from the subject matter presented. Most producers suggest that a two-person show be avoided. With only two people there is a tendency that one generally agrees with the other and a "yes-man" routine is developed, or the dullness of a simple dialogue is provoked, or perhaps even more often the conversation develops into an argument. Shows with three or four persons have proven to be the most successful. For the moderator-panel type program there should be not over four in the panel. If more people are involved, no one is given sufficient time.

### **11.9 Design of the Illustrations**

It is difficult to put down in a few paragraphs those principles of design or layout which can be applied to any type of illustration, be it a photograph, map, cartoon or graphic of some type. The easiest method is to describe the basic principles of advertising layout, for the planner's illustration is really an advertisement for the accompanying text material. It must then be left to the planner, in taking his photograph or drawing his map, to study his subject and apply the principles which fit the given case.

The primary purpose of the design is to attract the attention of the viewer to some key point or fact. The layout determines the scope of the message through the position, size and relation of the elements. It presents the approach, be it informal or dignified, hard or soft, ugly or beautiful.

The elements of a design may be used singly or together, in whatever manner will best achieve the desired results. The basic elements are:

1. *Copy*. The written word is used to inform, appeal or convince. For an A-V presentation, the speaker normally supplies the copy, although a few key words or sentences may sometimes appear. Words, however, must be legible to be useful: limitations are automatically imposed by the size of the audience.
2. *Headlines*. A few words in large, bold type are used to attract attention and identify the subject matter. They are also used to unify the other elements of the advertisement.
3. *White space*. Blank areas add beauty, contrast and emphasis. Prestige or quality products or events are usually advertised with larger amounts of white space. For example, compare the impact of a page in an automotive parts catalog with the dignity of a wedding invitation, or the complexity of a large-scale street map with the simplicity of a drawing of a single expressway intersection. The number of bold lines per square inch in each element of a design have as much to do with the "feeling" of white space as do the number of blank square inches between the elements.

4. *Illustrations.* Here is the meat of the matter for our purposes. Pictures or drawings, be they abstract or real, are used to tell a story. They provide an image of action to the accompanying text. They can be used to inform, explain the difficult, describe details, or simply to please the eye. Some examples would be a bar chart showing population increase (inform), a land use map (describe details), or a photograph of a new building (please the eye).

5. *Type.* Although used for the text or headline, type faces have a beauty and force of their own. Judicious selection can add to or injure the impact of the layout. For example, a tall, thin type might be used effectively to identify a tall, thin building, while squat, heavy type might be used to identify a slum photograph.

6. *Trade names and trade-marks.* In commercial advertising, the name and trade-mark are used as a signature. While the name of an agency can be used in the same manner across the bottom of an illustration, a trade-mark can take other forms for the planner. The use of the same type face throughout a presentation, or the same basic symmetry of layout, or the recurrence of some symbol, such as the little man mentioned earlier, can identify an illustration with its producer. This type of continuity can be carried through all of a planner's different presentations, as well as the agency's publications.

7. *Colour.* Colour compels attention, attracts the eye and suggests action. It can be used for contrast or emphasis, or simply to indicate the natural shade of some material. More is said about colour in the next section.

8. *Borders.* A border may assist in indicating the nature of the material, as in the case of a heavy black line being associated with an obituary. The border may aid eye movement toward key elements of the advertisement, or by its absence create an altogether different effect. In preparing a layout or design, remember that the purpose is to attract attention, and retain it as long as necessary for the viewer to receive the message. In putting the different elements together, care must be taken that they do not compete. They should provide for eye movement toward the central idea, and above all they should be simple and easy to grasp. The elements should be placed together in such a manner that they attain the unity, harmony, rhythm, symmetry and proportion which will achieve the desired result. Each element must be analyzed in regard to the others as to size, weight, structure, form, colour, texture, and the direction in which it tends to lead the eye.

This brief discussion can be summarized simply by stating that the elements must balance, lead the eye to the central theme or idea, and be attractive. Further discussion and analysis of the elements can be found in any good book on advertising, design or illustration techniques.

### **11.10 The Use of Colour**

The use of colour was briefly mentioned as one of the elements of design. It is true that the size and weight of letters or figures give the illusion of varying color even when only one is used, as can be seen by glancing at the headline above this paragraph. But the planner shouldn't need to be sold on the use of colour — his problem is usually a matter of whether or not he can afford to add it.

A full discussion of the fine aspects of colour is out of place here, but a few of the principles and suggestions will be helpful.

Colours are generally classified as cold (green-blue) or warm (red-yellow), the cold having a tendency to recede from and the warm seeming to move toward the viewer. Red-orange is the most eye-catching and attracting shade, but it is not always psychologically correct. Being "warm", it would not be used, for example, to illustrate a tray of ice cubes, just as a "cool" blue-green would not be a judicious choice in a furnace advertisement.

By the same token, a relatively large area of cold colour is needed to have the same eye attraction as a small area of warm colour. Therefore a cold colour would not be a good choice for a key word (other elements would dominate) and a hot colour would not be a good choice for a background (it would dominate).

Imbalance must be achieved between the coloured and the black and white areas. One or another should dominate in the sense of area covered. For hot colours, the black and white should dominate; for warm colours, they should dominate. Correspondingly, the colour should be massed or organized into potent areas, rather than spotted here and there across a large illustration.

The use of a second colour can make the result so much more effective that it is usually a false economy to limit an illustration to one. When a budget does impose this limitation, consider the greens, blues, reds and browns. Coloured paper can also make a one-colour illustration much more attractive.

Many people are disappointed by colour photography. It is generally known that films do not capture the exact shades seen by the eye. If experimentation is not possible, and the results must be perfect, consult a professional photographer for proper choices.

### **11.11 A Closer Look at Audio-Visual Equipment**

When it is decided to produce an A-V program, the first question will no doubt be "How much will it cost and how much time will it take?" Costs can be broken down into three columns: the cost of the original visual aid, such as a photograph or drawing; the cost of preparing the visual aid for

presentation, such as making a slide from the drawing; and the cost of the display or projection equipment. In some cases the first two factors can be combined—it is just as easy to draw a map 4 x 5 feet for display as it is to draw it 8 x 10 inches and then go to the expense of a photographic enlargement.

The production costs depend upon how much work is done by the planning agency and how much is placed under contract to a local film producer, professional photographer or artist. Many motion picture producers now provide a wide variety of audio-visual services — from a 35 mm. slide presentation to a widescreen motion picture production. As a planning agency's program develops and the staff gains experience, the director no doubt will be able to designate certain A-V productions to an internal staff team and other productions to an external professional producer. The more display and projection equipment a planner sees, the more audio-visual people he talks to, and the more audio-visual publications he reads, the better he will be able to decide what is the most practical and feasible A-V program for his particular situation.

A study of display and projection equipment must of course consider factors other than cost. There are advantages and disadvantages to the use of each item, and selection must be made in the light of what effect these factors will have on a planner's individual situation and abilities. The comments below follow the order in which the equipment was defined earlier in this report. More emphasis is given to the steps necessary to prepare audio and visual aids for use with reproduction equipment, because of its greater complexity, current popularity, and the serious consideration which accompanies higher costs.

### **Animation**

We normally think of animation in terms of a Walt Disney motion picture cartoon. Certainly this is true, and indeed this is the highest order of animation. But the term really implies motion, and motion can be simplified down to the basic chart. For example, a bar chart can be made in a double thickness, with the second layer nothing more than a solid sheet of color, and the first layer, giving the form, wording and numbers of the chart, cut out in such a manner that the color will show through the holes to make the bars. Blank paper inserted between the layers can then be extracted to give the bars, as they slowly appear, the animation of illusionary growth. In a similar manner, cartoons can be made to "move" by pulling strings, or outline maps can be filled in gradually by flipping overlays. The only limitations to the possibilities are imagination and mechanical inventiveness. A professional designer or artist is equipped to do this type of work; charges could vary so greatly that it would not be practical to give estimates.

## **Blackboard**

Still the standard piece of visual equipment in our school systems, the blackboard has many drawbacks which affect its use. The grating noise of a piece of chalk improperly rubbed against the board is enough to drive any audience away. Glare can mar the view of a large part of an audience. The necessity of frequent erasing distracts from the continuity of the presentation. And, of course, the writing or drawing must be completely legible and large enough so that all may read and see. Unfortunately, the handwriting of many people indicates that it would not be wise for them to attempt to use a blackboard as their primary piece of visual equipment. On the other hand, a blackboard permits the speaker to change the size of his writing and illustrations to suit the size of his audience — a factor which can be costly with any preprepared visual aids.

## **Bulletin Board**

A bulletin board is essential when illustrations have been prepared on thin, flexible paper. It is usually helpful to have an assistant do the mounting, or the planner will have to turn his back to the audience and fumble with the material. A blackboard can be considered a bulletin board, with the aids mounted with tape rather than pins or tacks. It might be noted here that small visual aids can be enlarged by a photo static process, at relatively small cost, for presentation on a bulletin board. The board itself will vary in cost with size and material.

## **Easel or A-frame**

Frames can be made by the planner himself, should he happen to be handy with tools, or a building maintenance man or carpenter, or purchased commercially. They are used to hold and display material mounted on portable blackboards, bulletin boards, feltboard or pegboard, or the visual aids themselves if prepared on stiff drawing board. The planner should consider the drawbacks to using any of these pieces of equipment if transportation to presentation sites enters the picture. He might find himself in an awkward situation if, after having purchased a 4 x 6 foot bulletin board and easel, he finds that they do not fit in the trunk of his car and he must struggle with them on a bus.

## **Felt board**

Adhesive cut outs are particularly useful in the illustration of motion, such as the movement of automobiles along a proposed interchange. The street lines can be indicated with tape or string, and the cut-out cars can be moved along and placed in position at will. Use is perhaps more adaptable to the discussion of various proposals than the presentation of a finalized plan.

## **Flash Cards**



Due to their small size and effective use in rapid sequences, flash cards are difficult to adapt to a planning situation. They are used primarily in language training, testing, or to emphasize key words or actions.

### **Flip Charts**

The same consideration must be given to transporting bulky flip charts and supporting frames as was given to easels and the material they may be used to display. Flip charts have a distinct advantage over separate illustrations in that the change from one to another is much faster and easier to accomplish.

The illustrations, of course, must be on completely flexible paper. Here again, cost will depend upon whether the planner prepares his own illustrations and makes the frame, in which case he pays only for the materials, or has the job done commercially.

### **Model or Mock-up**

The primary consideration in the use of models is the size of the audience. If a model is designed for table display, the number which can gather around the table at one time is the maximum audience size. In this case, the speaker would ideally stand on one side of the table, in order to point out various aspects to the audience, standing on the other three sides. Unfortunately, city planning is not conducive to the making of models which the speaker can hold in his hands, as is frequently done in the automotive and other industries. The product here is an area, and not some single object.

The use of table models would be most effective as a lobby display, which can be viewed by the audience after the planner's presentation. That presentation, by the way, might make use of photographs of the model. Cost will depend on size, detail, materials, and the producer of the model. It is usually too technical and time-consuming for the planner to build a model of, for example, an entire urban renewal area, complete with scaled buildings, landscaping and other features. A simpler and cheaper method, where principles rather than appearance are the objectives, might be achieved with a sand table (basically a child's sandbox elevated to table height), wherein the sand can be shifted to indicate grades and elevation. Miniature replicas of buildings, automobiles, trees and people can be purchased from a local hobby or model store, and used effectively to demonstrate the desired principles.

### **Pegboard**

Ideally suited to a lobby display, particularly of publications or other materials, pegboard is difficult to adapt to a changing visual presentation. Considering the size of the audience, illustrations are

rarely much smaller than the largest piece of pegboard a planner might want to carry to a meeting, and the display of only one item might suggest that a bulletin board or easel would be a better choice of equipment.

Audio visual aids are those devices through which messages can be seen as well as heard, simultaneously. Synchronization of these two important senses leads to more learning and more retention when compared to the use of visual and audio senses separately. We learnt from the previous section that the two senses, sight and hearing, together, attracts 94 % of audience attention. This is clear cut evidence that audio visual aids can play an important role in extension teaching

### **Motion Pictures**

Motion pictures are extremely useful in motivating and teaching any learner. Yet educational films are not being widely used by extension educators in many development sub sectors. The reasons usually given are:

- The expense of films and projectors.
- Non availability of suitable films.
- Transportation and maintenance of films and projectors.
- Dominance of entertainment over educative function of films.
- Lack of skills, on the part of extension workers, to operate projectors.

#### Preparation

- See the preview of the educational film and assure yourself that it is suitable for the planned extension activity and intended audience.
- Note down important teaching points and difficult words that audience might not understand.
- Compose a few questions which are answered in the film.
- Make sure that the projector and film are in good condition and that there is sufficient darkness in the presentation area, before the arrival of the audience. Presentation
- Make your audience aware that the purpose of the film is educational and not entertainment, and that they will be expected to learn the messages from it.
- Tell them the title of the film and say, generally, what the film is about.
- Explain why this film is important and relate it to their own self interests.

- Write the questions that you composed on the chalkboard and inform them that these questions will be answered by the film.
- Try to show the film without any breaks or distractions.
- Immediately after film screening, encourage the audience to discuss it, freely.
- Distribute relevant literature, and provide contact addresses for further information.
- Demonstrate the skill, if any, showed in the film.
- If required show the film again.

### **Video Projector**

A video projector is also known as a Digital Projector, now popular for many applications for extension and development. All video projectors use a very bright light to project the image. Projected image size is important because the total amount of light does not change - as size increases, brightness decreases. They are widely used with, or without a connection to an interactive white board for presentations, training, demonstrations, etc. CRT projector that uses cathode ray tubes is the oldest system still in regular use, but falling out of favour largely because of the bulky cabinet. An LCD projector using LCD light gates is the simplest system, making it one of the most common and affordable, currently.

### **Interactive White Board**

An interactive white board is a large interactive display that connects to a computer and projector. A projector projects the computer's desktop onto the board's surface, where users control the computer using a pen, finger, or other device. The board is typically mounted to a wall, or on a floor stand. Purpose

- It is a replacement for a whiteboard, flipchart, or video, or, other media system, such as a DVD player and TV combination.
- Can interact with online information from anywhere.
- Captures notes written on the whiteboard for later distribution.
- Some interactive whiteboards allow recording the instruction as digital video files for review – a very effective instructional strategy for learners who benefit from repetition, for those who need to see the material presented again, those who are absent, for struggling learners, and, for future review.
- With its integrated audience response system, presenters can get feedback.

- Helps to teach abstract, difficult concepts and complex ideas – visual tools help learners concentrate for longer and understand more fully.
- Technology has the capability of bringing lessons to life and making the lessons much more enjoyable for the learner.

### Multimedia and Multiple Media

Multimedia is a combination of more than one media, but it could include several forms of media - audio, text, still images, animation, graphics, video, and film. The use of more than one aid is increasingly common. Even earlier, multiple media presentations were assembled with the available traditional audio visual aids resources.

**Example:** Combinations of overhead projectors, flipcharts and slide projectors.

Multimedia in a more current context generally implies a computer based media. The term, computer based multimedia, has become very popular. Interactive video is one form of computer based multimedia. With computer based multimedia, information access is simplified. Sophisticated databases can organize vast amounts of information which can be quickly sorted, searched, found, and cross indexed.

**Example:** Through information kiosks, a lot of developmental information is being accessed in remote and rural areas.

The advantage of using multiple media is that it can greatly increase the impact of presentation. It can also lead to a confused presentation, if not planned very carefully. The best advice is to use multiple media only if needed.

### 11.12 Role of Audio-Aids in Rural Development

The audio-aids such do, gramophone records, and pre-recorded cassettes provide an economical and convenient source of development (information content that can be readily made available to rural audience. The content and sequence of information through these aids Techniques of are fixed and they can also be used for independent study. These audio aids can be used in Communication a variety of ways either alone or in combination with printed materials. Some of the specific uses of audio-aids in rural development can be following:

- The audio-aids such as radio and audio cassettes will be highly effective in creating awareness about innovations or developmental programmes.

- Information through radio, and audio cassette followed by group discussion in the form of radio-rural forums will be effective in creating favourable attitude and initiating action towards adoption innovations.
- The radio will be highly useful in providing regular forecast of weather and news about market situation, developmental programme as well providing information during emergency situations like flood, drought etc.
- The recorded devices such as audio cassette, gramophone records etc. can be effectively used in individual learning and training of group of farmers, functionaries and extension officers.

### 11.13 Selecting the Media Mix

Audio Visual aids will supplement the extension and development worker but cannot replace them. All aids cannot be used for all occasions, but for every occasion, there are aids which should be carefully selected and properly used. No single rule-of-thumb can be given for the selection and use of various audio visual aids to ensure effectiveness in all situations. In order to get the most effective results, the extension worker should:

- select the appropriate aids
- have a suitable combination of the selected aids
- use them in proper sequence.

Audio visual aids are used singly, or, in combination, taking into consideration the following factors

**Nature of Audience:** Printed media are for literate people, whereas exhibits, pictures and symbols are for less literate people.

**Size of Audience:** A video show or white board cannot be used effectively when the number of participants exceeds 30; leaflets, bulletins, or hand-outs can be used for a single reader at a time, while a public address system, or messages via the internet can be used for large audiences.

**Teaching Objective / Expected Nature of Change:** Select the audio visual aids based on the objective of extension teaching, i.e., to bring about a change in

- thinking or knowledge?
- attitude or feeling?
- actions or skill?

**Example:** if you want merely to inform, or, to influence a large number of people slightly, use mass media such as radio or television.

**Nature of Subject Matter:** where the new practice is simple, or familiar (i.e., similar to those already being followed) a news article, radio message, or, circular letter will be effective, whereas complex, or, unfamiliar practices will require audio visual aids.

**Availability of Aids:** media such as newspapers, telephones, radio, etc., will also have a direct bearing on the extent to which these methods can be used.

**Relative Cost:** effective aids need not be necessarily costly. The amount expended on audio visual aids, in relation to the extent of effectiveness, is also an important consideration in their selection and use.

**Extension Worker's Familiarity:** familiarity of the extension worker with the use of audio visual aids, skill in selection, preparation, and use of aids will also influence the selection and use of the aids.

The rural communicator will do well to choose a combination of formal and non-formal media. The possibilities are indicated below:

**TV:** With the increase in coverage and increase in TV ownership in rural areas. TV is gradually becoming the prime medium for rural communication.

**Cinema:** The cinema is a useful medium in the rural context. Most large and medium villages have one or more cinema houses. Also, more than one-third of all rural people do see cinema as a matter of regular lifestyle. Advertisement films show feature films with disguised advertisement messages, and documentaries that combine knowledge and advertisement. It has been estimated that 33 per cent of the cinema earnings in the country come from rural India.

**Radio:** The radio is a well-established medium in rural areas. A big expansion in broadcasting facilities has taken place in the country over the years. The availability of radio sets has also expanded. While radio as a medium cannot match TV in potency and effectiveness, in the exiting context, it can certainly play a significant role in rural communication.

**Print media too has some scope:** While the role of print media is certainly limited in the rural context, it cannot be ruled out totally. Even the remotest rural parts have a small group, which is literate. Moreover, while the group may be numerically small, its members usually happen to be the opinion leaders, influencing the purchasing behavior of large segment of their rural consumers. So, it would be unwise to assume that the print media has no scope at all in the rural areas. Moreover, the younger generation in the rural areas is comparatively more literate. They can certainly be approached through the written word and they can be used as carriers of messages to the older generation. With the new trend of increasing rural literacy, the scope for using print media in rural communication will increase further.

Outdoor: The outdoors which includes hoardings, wall paintings, illumination and other displays also, lend well for rural communication. In fact many companies are using the outdoors imaginatively in their rural communication mix.

POPs: The POPs point of purchase (or point of sale) promotion tools are also quite useful in the rural markets. The POPs meant of the rural market should be specially designed to suit to rural requirements. Symbols, picture and colours must be used liberally in POPs meant for the rural markets. Colour is of particular significance. As general rule, the rural people love bright colours. The effective communicator utilizes such cues.

Audio visual /publicity vans: The AV unit or the publicity van is very useful for rural communication. The van is a comprehensive mobile promotion station at the exclusive command of the concerned firm. The firm can exhibit its films and other audio-visual presentations, such as slide shows, sound and light presentations; puppet shows etc. from its instant promotion station. A portable shamiana or platform often forms a part of the van. Even public meetings can be organized using the portable shamiana. Portable exhibition kits can also be carried in the van and exhibitions put up instantly. The van can also be used for sales campaigns in addition to promotion campaigns. It can also be used for product demonstrations. In short, the van can be used for carrying and delivering a tailor-made communication programs to the rural audience.

#### **11.14 Functions of Audio Visual Aids**

When properly used, audio visual aids contribute one or more of the following functions.

- i) Convey meaning clearly
- ii) Capture attention, arouse and sustain interest
- iii) Increase the correctness, clarity and effectiveness of the idea and skills being transferred
- iv) Help in learning more, faster, and with thoroughness
- v) Help in remembering longer
- vi) Reach more people, irrespective of their level of literacy, or language
- vii) Save the instructor's time
- viii) Reduce the possibility of misinterpreting concepts
- ix) Clarify the relationship between material objects and concepts
- x) Supplement the spoken word – the combination of audio and visual stimuli is particularly effective since the two most important senses are involved
- xi) Highlight the main points of the message clearly

#### **11.15 Limitations of Audio Visual Aids**

- i) Learners may sometimes form distorted impressions, unless audio visual aids are supplemented with required explanations

- ii) They may tempt the extension worker to narrow down his teaching to only a few big ideas, not giving the complete picture of a subject
- iii) There is the possible risk of 'spectatorism' instead of the attitude of thoughtful enquiry. Some extension workers acquire the mistaken idea that they have little to do when audio visuals are used.

## **Cross-Media Approach in Rural Development**

### **11.16 Introduction**

The term "Cross-Media" is often explained as something that includes and combines television, newspapers/magazines mobile devices and Internet along with the distribution of content (e.g. music, text, pictures, video etc.) amongst different media. Cross media is usually seen as the use of traditional media along each other in an innovative way. Cross media approaches are seen from different perspectives—for commercial purpose like marketing, advertising and broadcasting arrangements); for social message delivery purpose like designing campaigns, and so on. In the current scenario consumers control the use of media; they decide when and where they wish to access specific media and content. Thus the cross media sector itself defines the term as follows: "The cross media-sector provides multimedia products and services by using radio, television, Internet, mobile devices, print and events simultaneously along each other." Another definition of cross media, Cross media-expert- "Cross media is a communication tool including a story that encourages you to switch from one medium to another, and back" The result is added value to the concept in many ways:

1. On the one hand the depth of the message and the campaign increases manifold which in turn leads to more benefits for the user,
2. While on the other hand, the chance of making a cross-over to another medium is increased due to the interesting message delivery.
3. Another important benefit of a good campaign is the increased possibility of exposure, repeated frequency leading to successful word-of-mouth (buzz). This way, the investment of a good campaign story can result in a huge success, within a relative short time-span. Cross media is used to imply the communicative goal of a concept.

The term "Cross-Media" is often explained as something that includes the distribution of content (e.g. music, text, pictures, video etc.) amongst different media. One frequently used combination is television, newspapers/magazines mobile devices and Internet.



Cross media is usually seen as the use of traditional media along each other in an innovative way. However, the term can be used in a variety of ways; cross-media concepts are not only formed by means of a commercial purpose (including marketing campaigns and broadcasting arrangements) but also depend on the personal lives of consumers. In the current media-landscape consumers control the use of media; they decide when and where they wish to access specific media and content. The cross media sector itself defines the term as follows:

*“The cross media-sector provides multimedia products and services by using radio, television, Internet, mobile devices, print and events simultaneously along each other.”*

This implies that the cooperation between companies and specialists is part of the concept of cross media as well.

### **Technology vs. Communicative Goal**

In several sectors cross media is associated with innovation and technique. Publishers, for example, use the word cross media for database publishing; articles, designed for magazines, distributed amongst other media like CD or e-paper. This process of distributing the same content through different channels is also called multi-channelling.

The current tendency amongst production companies and broadcasting corporations, however, is somewhat different. More and more content is developed first, and changed afterwards, to suit different media. Examples of this are podcasts and vodcasts. This content can be downloaded to, for example, an iPod, and viewed or listened at any desired time. Users can rate the content, and additional related items can be recommended to them by other users.

This last example shows that a cross media-concept does not necessarily have to be linked to a technical concept. It shows that cross media can be used as a tool to achieve a communicative goal (In this case giving an opinion about a podcast). In other words, the term cross media is used to imply the communicative goal of a concept.

### **Storytelling**

Another definition of cross media is:

“Cross media is a communication tool including a story that encourages you to switch from one medium to another, and back.”

The result is added value to the concept in two ways: on the one hand the depth of the story increases (which leads to more benefits for the user), while on the other hand, the chance of making a cross-over to another medium is increased due to the interesting story.

Another important benefit of a good story is the increased possibility of successful word-of-mouth marketing (buzz); this way, the investment of a good marketing story can result in a huge amount of profits, within a relative short time-span.

## **Marketing**

Cross-media marketing involves the use of different media, based on their specific qualities. The main purpose of this combination is to increase the domain of a campaign. In other words: the media mix has to serve the campaign-concept, in order to maximize impact on the target group.

The use of different media does not necessarily lead to a cross-medial concept. However, if the different media are used in such a way that their qualities are used to the fullest, and the possibility of participation of the target group is present, one could call it a cross-medial concept.

### **11.17 Cross Media Approaches**

#### **1. Deliver a clear message:**

Deliver a clear message to make your ad campaign most effective. As I said earlier, the message should be consistent in all the media you use for the multimedia ad campaign.

#### **2. Make videos a priority:**

Numerous studies show that people like watching a video more than reading a blog post. Because videos are simply more engaging. That's why videos are becoming a priority for companies. You should also make video a priority to deliver your message.

#### **3. Create a clear Call-to-action:**

A clear CTA is vital because it regulates the further action of your audience. A clear Call-to-action can increase your Conversion rate.

#### **4. Maintain a synergy across various media:**

In a cross-media marketing campaign, you use more than one media. Therefore, you have to ensure that all of your media platforms work in a synergy to build and maintain consistent brand awareness.

#### **5. Put your audience first:**

Customers are king. So, before design, a product or launching a marketing campaign always keep in mind the needs of your audience.

#### **6. Offer personalized service:**

It is essential to add some personal touch in your advertising because it will help create trust and strengthen your brand image.

### **11.18 Tools of Cross Media**

## **1. Direct mail:**

“Old is Gold.” Direct marketing is still the most popular and cost-effective multichannel marketing tool. It is the best starting point for your cross-media marketing campaign.

## **2. Email:**

Emails have a central role in your cross-media marketing campaign. You can run an email marketing campaign in addition to any marketing media platform to emphasize your marketing message.

## **3. Newspaper and magazine ads:**

These are the old traditional ways. They were rapidly losing their popularity in the digital world. So, you should always use other marketing channels in addition to newspaper advertisements.

## **4. Television ads:**

As YouTube becomes more popular every year, televisions are slowly losing their popularity. Additionally, television advertisements are very costly. You should use them only if you have a large pocket.

## **5. Google Adwords:**

The ads you see on various websites, YouTube channels are products of Google Awards. They are cheap and affordable because you can set your Google Adwords campaign very quickly. So, you only have to open a Google Adwords account, and according to your budget, you can run your marketing campaign.

## **6. PURLs, CURLs, and GURLs:**

PURL—Personalized URL.

These URLs are for everybody on your marketing list.

CURL—Customizable URL.

These URLs are for a specific group of individuals on your marketing list.

GURL—Generic URL.

These URLs are designed for a specific marketing campaign.

## **7. QR code:**

Quick Response Codes are becoming more popular nowadays because it is elementary to use. For example a person only has to scan a printed QR Code with his smartphone. The person will automatically direct to your website.

## **8. IP targeting:**

IP targeting is the process showing specific advertising to a specific person based on their Internet Protocol (IP) address. Thus, it targets a particular multichannel marketing tool.

There are numerous more. But these are so far the most effective and thus most popular.

## **11.19 Benefits of Cross Media**

1. Deeply connect with your customers: Multimedia marketing helps to build a long-term relationship with your audience. Because the more they engaged and interact with your product, the more prone they will be to buy your product.
2. Broadening your reach: Marketing via multiple channels ensures greater visibility of your product. Marketing is all about starting a conversation. Thus, starting a conversation across multiple channels can exponentially increase your brand awareness.
3. You can focus on the most suitable channel for you and your customers: Finally after completing the campaign, you can gather the data related to the effectiveness of various media. Then, after having these data, you can structure your next campaign more effectively.
4. Increase your brand awareness and improve your brand identity;
5. Reduce your cost for marketing: As you spending your money collectively on various media platforms, cross-media marketing significantly reduces your marketing cost.
6. The outcome of your advertising campaign is visible after the campaign.

## **Media Forums**

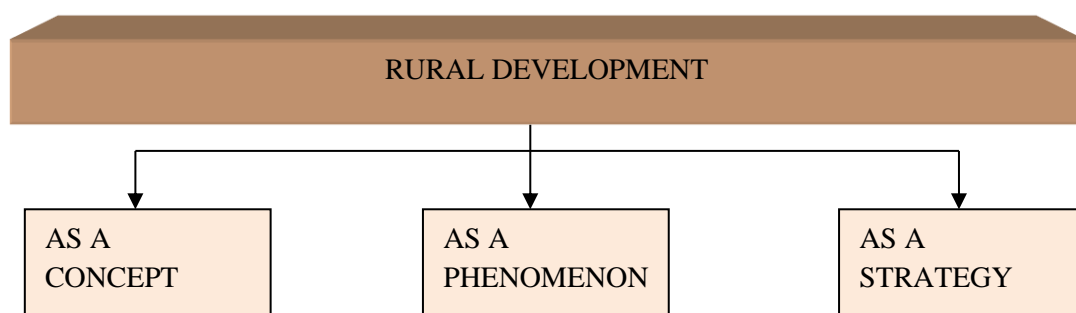
### **11.20 Introduction**

Today, with more than 500 million family farms out of 570 million farms worldwide, family farming is the predominant mode of agricultural production in both developing and developed countries and a major player in food production throughout the world. Family farmers tend to run crop diversified agricultural systems and preserve traditional food products, contributing both to a balanced diet and the safeguarding of the world's agro-biodiversity. To recognize and celebrate the

importance of family farming for eradicating poverty and improving global food security the United Nations proclaimed 2014 as the International Year of Family Farming (IYFF) and tasked FAO to facilitate its implementation in collaboration with Governments, UNDP, IFAD, the Consultative Group on International Agricultural Research (CGIAR) and other relevant organizations of the United Nations system, as well as relevant non-governmental organizations. In connection to the IYFF, FAO will convene an international Forum on Communication for Development & Community Media for Family Farming (FCCM) in Rome from 23 to 24 October 2014, to showcase the role of Communication for development (Communication Development) methods and tools as a driver for innovation and family farmers' participation in rural development strategies. FAO is a pioneer in using participatory communication to engage farmers and make their voices heard in policy processes. The FCCM will address opportunities for promoting new rural communication services as sustained, inclusive and efficient communication processes involving family farmers and the rural population.

### **11.21 Concept of Media and Rural Development:**

The idea of Rural Development is nothing but a process where the standard of living of rural people increases continuously. It may be defined as “improving the living standards of the low income people living in rural areas and making the process of their development self-sustaining. In fact, the concept of rural development encompasses a wide spectrum and has attracted the attention of international agencies and Asian countries including India in recent years. Significantly in more recent years, the concept of rural development is used in different context which can be shown with the help of following chart.



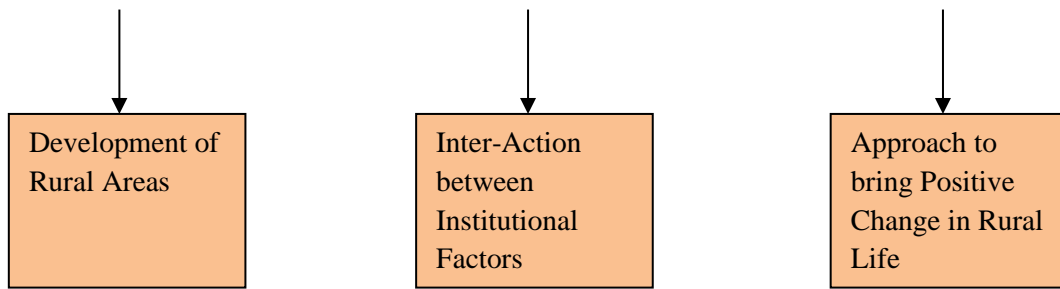
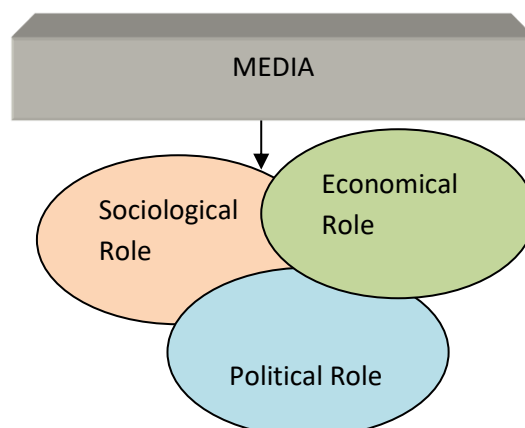
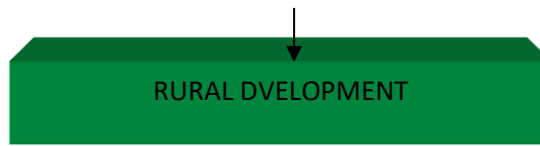


Chart highlighted that as a ‘concept’ rural development refers all round development of rural areas including the improvement of lifestyle of rural people; as a ‘phenomenon’ it implies the interaction between physical, environmental, technological, economic, socio-cultural and institutional factors in the rural areas and as a ‘strategy’ rural development is nothing but an approach or operational design to bring about desired positive change in socio-economic and cultural life of the people living in rural areas.

**11.22 Inter-relationship between Media and Rural Development:** ‘Media’ and ‘Rural Development’ is closely inter-related in the sense that from the era of bullock cart we have travelled down the modern age of satellite technology. The role of media in the process of rural development has been recognized ever since the beginning of planned development in India. In the process of societal integration and development of rural people’s lives, media has been playing a significant role in India. As information is used as power, so media (Print and Electronics) can play a role in state operations, business operations, environment issues, monetary policy, politics, international affairs, human resources development and investment by providing accurate and dependable information. That is why various sociologist thinkers say that media has become as necessary as food and clothing is in the present day world. But to understand what role media can play in rural development we have to understand media’s role in all its dimensions, i.e., Sociological, Political and Economic dimensions. Accordingly, the present study is designed and it can be shown with the help of following loop-diagram as developed by the author himself.





The above loop diagram implies that media can play a significant role in the process of rural development by strengthening and transforming the economic, political and social life of the common people living in the remote areas particularly in Assam. For instance, media can play an important role in the economics of rural people by searching alternative ways of making a living. It would reduce the pressure on land and increase family's economic status. It can help in enlarging the market for goods produced in the rural areas and can make the common people aware to broaden the entrepreneurial base and competitiveness among the different classes. In the sociological sphere of activity, media aids in the process of status change of the people from heredity to achievement. To do this it has successfully motivated illiterate to become literate. Media can help in changing and transforming the traditional ideas into scientific one and thus bring about greater equality and a greater respect for human dignity and make cultural and social change, a self-perpetuating process. With respect to role of media in political field, it can say that media bring about greater equality and respect for human dignity. It motivates the leaders as well as the common people and makes the public know of governments plans and programme for rural development purposes. Media can establish a road to good governance by focusing the dark side of the government in one side, and on the other hand it can increase the efficiency of the government by appreciating the services render to the society through its development projects

### **11.23 Definitions of Media Forums**

The term forum defines an online platform on which users can exchange information. At that time, the first vehicles were also pioneers for the **transmitter-receiver model**. The sender-receiver model describes the form of communication between a sending party and the receiving parties. A very classic example is the cinema. As one of the first popular media, feature films spread stories and information. The viewer can watch the film but has no influence on it. At some point there was the radio, just like the newspaper, you could react to articles and comments. Unlike newspapers, radio for the first time made it possible to react in real time with the help of the telephone. The presenter and audience were able to make direct contact. However, there were still barriers, e.g. the editor, who selects the conversation partners for the live broadcast. Three or four people are then

connected between thousands of calls. For the first time, the transmitter-receiver model was changed by the Internet. The change of the communication model looks like this:

- 1:m – one organization / company sends, all receive
- M:n – all (can) transmit / all receive

The Internet is a digital platform in which anyone can provide equivalent data, information, but also media, to unveil without meaning, as well as cat videos, or one of the largest operators of the Internet, pornography. Forums made it possible to exchange data and, of course, opinions. This is why they are so important and are still very often used by society today. For example, as an operating manual for software. Here users can ask questions and the developers, or administrators can give answers and feedback to these questions. Each user can add further comments and of course add their own ideas. The transmitter-receiver model has changed fundamentally. From a structure of pure sending to sending and receiving or receiving and sending.

### **11.24 Development of Networks, Forums**

In a forum opinions and thoughts can be exchanged freely. Users can log in, create their own accounts and then create their own avatars. We're ready to go. Of course you don't have to register at every forum, but most of them require it in order to be able to upload the quality of the posts. The more open a forum is, the more bots and spam posts can be collected here. Therefore it is especially important for the administrators of a forum to keep their board clean and to avoid such things.

Forums are not only important for the members, who exchange themselves here mutually. The majority of the people on the forum are only passively on the move. E.g. by the inquiry in a search engine, after a certain topic, keyword, or even a question. No matter whether it concerns young families who have questions about pregnancy, later about building their own house and perhaps a little later, the first child goes to a college or university. No matter in which area of life, questions come up all the time and there are millions, maybe even billions, of answers in forums.

For these reasons, forums have also existed since the beginning of the Internet. The **development of social networks** also had a lasting influence on them. Until today forums have an extremely high relevance, of course also for SEO agencies. These are particularly concerned with search engine optimization. Backlinks, i.e. links to your own online project from large and well-known forums, are a great advantage for companies. That is why many agencies try to place links for their customers in renowned forums. A simple example from life could be now, when the young family father is looking for the right pram. He goes to the search engine and asks:

- “What should I look out for when buying a pram?”



Exactly the same chain of words appears as a question in a forum for young parents. Directly the comment refers to a baby carriage manufacturer, in whose online shop one gets all models fast and favourably supplied. Our young family man takes the supposedly authentic user recommendation and will perhaps click on the link. What's the matter with you? We trust the opinion of other people. That's why forums are also a very interesting area for online marketing.

An **Internet forum**, or **message board**, is an online discussion site where people can hold conversations in the form of posted messages. They differ from chat rooms in that messages are often longer than one line of text, and are at least temporarily archived. Also, depending on the access level of a user or the forum set-up, a posted message might need to be approved by a moderator before it becomes publicly visible.

Forums have a specific set of jargon associated with them; example: a single conversation is called a "thread", or *topic*.

A discussion forum is hierarchical or tree-like in structure: a forum can contain a number of sub forums, each of which may have several topics. Within a forum's topic, each new discussion started is called a thread and can be replied to by as many people as so wish.

Depending on the forum's settings, users can be anonymous or have to register with the forum and then subsequently log in to post messages. On most forums, users do not have to log in to read existing messages.

A forum consists of a tree-like directory structure. The top end is "Categories". A forum can be divided into categories for the relevant discussions. Under the categories are sub-forums and these sub-forums can further have more sub-forums. The *topics* (commonly called *threads*) come under the lowest level of sub-forums and these are the places under which members can start their discussions or *posts*. Logically forums are organized into a finite set of generic topics (usually with one main topic) driven and updated by a group known as *members*, and governed by a group known as *moderators*. It can also have a graph structure. All message boards will use one of three possible display formats. Each of the three basic message board display formats: Non-Threaded/Semi-Threaded/Fully Threaded, has its own advantages and disadvantages. If messages are not related to one another at all, a Non-Threaded format is best. If a user has a message topic and multiple replies to that message topic, a semi-threaded format is best. If a user has a message topic and replies to that message topic and responds to replies, then a fully threaded format is best.

## **User groups**

Internally, Western-style forums organize visitors and logged in members into user groups. Privileges and rights are given based on these groups. A user of the forum can automatically be promoted to a more privileged user group based on criteria set by the administrator. A person viewing a closed thread as a *member* will see a box saying he does not have the right to submit messages there, but a *moderator* will likely see the same box granting him access to more than just posting messages.

An unregistered user of the site is commonly known as a *guest* or *visitor*. Guests are typically granted access to all functions that do not require database alterations or breach privacy. A guest can usually view the contents of the forum or use such features as *read marking*, but occasionally an administrator will disallow visitors to read their forum as an incentive to become a registered member. A person who is a very frequent visitor of the forum, a section or even a thread is referred to as a lurker and the habit is referred to as *lurking*. Registered members often will refer to themselves as *lurking* in a particular location, which is to say they have no intention of participating in that section but enjoy reading the contributions to it.

### **Moderators**

The *moderators* (short singular form: "mod") are users (or employees) of the forum who are granted access to the posts and threads of all members for the purpose of *moderating discussion* (similar to arbitration) and also keeping the forum clean (neutralizing spam and spambots etc.). Moderators also answer users' concerns about the forum, general questions, as well as respond to specific complaints. Common privileges of moderators include: deleting, merging, moving, and splitting of posts and threads, locking, renaming, sticking of threads, banning, unbanning, suspending, unsuspending, warning the members, or adding, editing, and removing the polls of threads. "Junior Modding", "Backseat Modding", or "Forum copping" can refer negatively to the behaviour of ordinary users who take a moderator-like tone in criticizing other members.

Essentially, it is the duty of the moderator to manage the day-to-day affairs of a forum or board as it applies to the stream of user contributions and interactions. The relative effectiveness of this user management directly impacts the quality of a forum in general, its appeal, and its usefulness as a community of interrelated users.

### **Administrators**

The *administrators* (short form: "admin") manage the technical details required for running the site. As such, they may promote (and demote) members to/from moderators, manage the rules, create sections and sub-sections, as well as perform any database operations (database backup etc.).

Administrators often also act as moderators. Administrators may also make forum-wide announcements, or change the appearance (known as the skin) of a forum. There are also many forums where administrators share their knowledge.

## **Post**

A *post* is a user-submitted message enclosed into a block containing the user's details and the date and time it was submitted. Members are usually allowed to edit or delete their own posts. Posts are contained in threads, where they appear as blocks one after another. The first post starts the thread; this may be called the TS (thread starter) or OP (original post). Posts that follow in the thread are meant to continue discussion about that post, or respond to other replies; it is not uncommon for discussions to be derailed.

On Western forums, the classic way to show a member's own details (such as name and avatar) has been on the left side of the post, in a narrow column of fixed width, with the post controls located on the right, at the bottom of the main body, above the signature block. In more recent forum software implementations, the Asian style of displaying the members' details above the post has been copied.

Posts have an internal limit usually measured in characters. Often one is required to have a message with a minimum length of 10 characters. There is always an upper limit but it is rarely reached – most boards have it at 10,000, 20,000, 30,000, or 50,000 characters.

Most forums keep track of a user's post count. The post count is a measurement of how many posts a certain user has made. Users with higher post counts are often considered more reputable than users with lower post counts, but not always. For instance, some forums have disabled post counts with the hopes that doing so will emphasize the quality of information over quantity.

## **Thread**

A *thread* (sometimes called a *topic*) is a collection of posts, usually displayed from oldest to latest, although this is typically configurable: Options for newest to oldest and for a threaded view (a tree-like view applying logical reply structure before chronological order) can be available. A thread is defined by a title, an additional description that may summarize the intended discussion, and an opening or **original post** (common abbreviation **OP**, which can also be used to refer to the **original poster**), which opens whatever dialogue or makes whatever announcement the poster wished. A

thread can contain any number of posts, including multiple posts from the same members, even if they are one after the other.

### **Bumping**

A thread is contained in a forum and may have an associated date that is taken as the date of the last post (options to order threads by other criteria are generally available). When a member posts in a thread it will jump to the top since it is the latest updated thread. Similarly, other threads will jump in front of it when they receive posts. When a member posts in a thread for no reason but to have it go to the top, it is referred to as a *bump* or *bumping*. It has been suggested that "bump" is an acronym of "bring up my post"; however, this is almost certainly a backronym and the usage is entirely consistent with the verb "bump" which means "to knock to a new position".

### **Sticking**

Threads that are important but rarely receive posts are *stickyed* (or, in some software, "pinned"). A *sticky thread* will always appear in front of normal threads, often in its own section. A "threaded discussion group" is simply any group of individuals who use a forum for threaded, or asynchronous, discussion purposes. The group may or may not be the only users of the forum.

A thread's popularity is measured on forums in reply (total posts minus one, the opening post, in most default forum settings) counts. Some forums also track page views. Threads meeting a set number of posts or a set number of views may receive a designation such as "hot thread" and be displayed with a different icon compared to other threads. This icon may stand out more to emphasize the thread. If the forum's users have lost interest in a particular thread, it becomes a *dead thread*.

## **11.25 Communication for Development: Key to Advance Family Farming Policies**

In recent years, communication has proven to be crucial for family farmers dealing with development challenges such as new market and employment conditions, climate change and environmental degradation, growing world population and higher food demand. Successful family farming and resilient rural livelihoods are increasingly linked to:

- Access to agricultural knowledge and information - timely access to up-to-date and reliable information is fundamental for farmers as they try to better understand, adapt and respond to new challenges and changing conditions.
- Social learning - family farmers need communication resources and suitable channels to share experiences, learn from each other and coordinate strategies with their partners.

- Engagement in policy dialogue - family farmers must participate in policy-making processes to express their concerns, articulate their demands and make their voices count. In this sense Communication Development methods and tools, integrating community media and the ICTs, have a remarkable impact on family farmers' capacity to access and process relevant information, get organized and participate in decision making. New services providing agricultural marketing and finance information through community media, mobile phones and low-cost ICTs are helping family farmers worldwide to save time and negotiate better rates, resulting in income increases as high as 30 percent. For instance, a recent study in Africa revealed that farmers using communication tools such as mobile phones have made steady incremental steps out of poverty, at a rate of 2.5 percent over 3 years. In India, participatory video was found 10 times more effective in promoting the adoption of sustainable farming practices than conventional extension approaches. Nevertheless, the emphasis should not be only on media and technologies but on the promotion of inclusive and demand driven Communication Development services to meet the knowledge and information needs of various stakeholders in the agricultural sector, especially family farmers.

There are different forums set up on an experiment basis to facilitate easy delivery of messages to the rural people on issues of development. Some of the significant forums where media has been utilized successfully are:

Radio Rural Forums- In 1956, UNESCO selected India for a unique experiment known as 'Radio Rural Forums Project', which was earlier successfully implemented in Canada. Pune was selected as the initial location of this experiment. Village radio forums were created and made to listen to half-an hour radio program broadcast by AIR and then discussed the content of the program. The theme of the experiment was, "listen, discuss and act". The research evaluation showed that, "the Pune radio forums helped to unify the villagers around common decisions and common acts, widening the influence of gram Panchayat and broadening the scope of its action." The radio forums continued to do some good work. In fact, credit for the success of the Green Revolution and the attaining of self-sufficiency in food production was partly given to radio. With the advent of the transistor, radio receiver sets became cheap and reach of radio was enlarged. The farmers of the Thanjavur paddy growing belt in Tamil Nadu, named the hybrid variety of paddy they grew after listening about it over transistor radio as "Transistor paddy." UNESCO considered the Pune experiment a successful model of development communication and it was repeated in several developing countries of Asia, Africa and Latin America. In India, at present local radio stations broadcast development programmes for rural masses, called farm and home programmes. There is a move to expand local radio stations. These stations can broadcast area specific programmes

keeping in mind the needs of the local people. Thus, radio can become one of the powerful medium for development. Several factors accounted for the success: the project was the centre of attention of many institutions and influential officials, the experimental treatments were brief, and the project had ample financial and staff support. The information available from Poona tends to support the concept that radio forums are a "potent tool" for rural development in India and elsewhere.

Community media - Community media is described in a broad sense, as "community communication". The concept of community media implies that for communities to be heard at national level, they have to be heard at grassroots level first. Community broadcasting seeks to foster debate about, reach consensus on and build solidarity in promoting and protecting human rights and achieving sustainable development, including peace and reconciliation. Community broadcasting is about both access to and dissemination of information. It acts as media for the flow of information to and from communities, on the one hand, and the national and international levels, on the other hand. It provides access to needed external information as well as advocacy on issues of concern, with relevant policy making levels informed by experiences at the community level and solutions generated therein. In a broader sense, community broadcasting enables greater participation by communities in national and international affairs. It has a dual role – that of a mirror (reflecting the community back at itself) and that of a window (allowing the outside world to look in at its experiences).

Community media provide a vital alternative to the profit oriented agenda of corporate media. They are driven by social objectives rather than the private, profit motive. Community media empower people rather than treat them as passive consumers and they nurture local knowledge rather than replace it with standard solutions.

The nature of community media is participatory and its purpose is development processes of public and private dialogue through which people define who they are, what they want and how they can get it. Community participation is thus seen as both a means to an end and an end in itself. The processes of media production, management and ownership are in themselves empowering, imbuing critical analytic skills and confidence about interpretations reached and solutions found. The medium chosen must, therefore, be one that enables, enhances and sustains community participation.

The first community-based radio station, licensed to an NGO was launched on 15 October 2008, when 'Sangham Radio' in Pastapur village, Medak district, Andhra Pradesh state, was switched on. Sangham Radio, which broadcasts on 90.4 MHz, is licensed to Deccan Development Society

(DDS), an NGO that works with women's groups in about 75 villages of Andhra Pradesh. Anna FM is India's first campus 'community' radio, launched on 1 February 2004, which is run by Education and Multimedia Research Centre (EMA<sup>2</sup>RC), and all programmes are produced by the students of Media Sciences at Anna University. The main thrust areas where the campus community radio generally focuses on are issues relating to health, education, career, stress management, interpersonal relationship between parents and children, lectures, workshops etc. A few projects that have been set up in consonance with the above Guidelines and are, Infact, examples of projects deeply embedded amongst marginalized communities in rural hinterlands, deserve a mention. In Chanderi (Madhya Pradesh), the community radio station- 'Chanderi Ki Aawaz'(The Voice of Chanderi) has been initiated by the weavers' cooperative. It is being run by a local community youth team that has been extensively trained (by digital media NGO One World South Asia) in community advocacy and focuses on women and child nutrition issues. While in Bhudikote (Karnataka) the community radio station 'Namma Dhwani' (My Voice) partnered by MYRADA (a NGO), Voices (a media group) and UNESCO has been owned, managed and operated with the active participation of women self- help groups focusing on livelihood security amongst the rural households. The current number of such community radio stations in the country, of which a majority are housed in urban university campuses, is just 141. In the area of Community based newspapers there are also grassroots papers written and published by and for locals. A prominent example is Khabar Lahariya, or News Waves, a weekly newspaper based in Chitrakoot, one of the poorest districts in central India. Written in Bundeli, the local language, the paper's all-female staffs has forged a reputation for investigative journalism and support of grassroots causes since the paper was founded in 2002 by Nirantar, a New Delhi-based literacy education non-profit. With a readership of 35,000 in 400 villages and costing 4 U.S. cents, the paper has no glitzy promotion strategy like its urban counterparts. Khabar Lahariya's marketing strength is instead its bold reporting on issues concerning lower-caste communities, for which it won the 2009 King Sejong Literacy Prize from UNESCO, among other recent accolades. However, the main reason why Khabar Lahariya receives such kudos is that it is run by trained women from marginalized communities and it conducts (in conjunction with Nirantar) journalist training and writing programs for locals — a vital step, many believe, in increasing rural literacy. Public Service Broadcasting – The roots of public service broadcasting are generally traced to documents prepared in support of the establishment of the British Broadcasting Corporation (BBC) by Royal Charter on January 1, 1927. This corporation grew out of recommendations of the Crawford Committee appointed by the British postmaster general in August 1925. The public service broadcaster is concerned with developing taste, promote understanding, spread literacy and development, create informed debate

and empower the disadvantaged - major issues. Programmes like “Krishi Darshan”, ‘Grameen Bharat’, and ‘Jaago Grahak Jaago’ have informed and educated farmers, villagers, and common citizens of the latest technologies and innovations available to them in their profession or rights and opportunities they possess as citizens of the country.

## **Using of Social Media for Rural Management**

### **11.26 Introduction**

The Indian society is a convoluted society with multi cultures, multi tribes and castes, multi lingual and the disparities between the urban and rural people. Since the origin of independent India, no one can deny the fact that India has grown as a nation and as economy rapidly with major growths from infrastructure to public health care, from communication sector to IT field and much more. Social media has affected all spheres of rural people’s lives: right from their livelihood to their healthcare, from traditions to social campaigns etc. convoluted. The Indian society is a complex society with multi cultures, multi tribes and castes, multi lingual and the disparities between the urban and rural people. Since the inception of independent India, none can deny the fact that India has developed a lot in almost all the fields leading from infrastructure to public health care, from communication sector to IT field and much more. This paper aims to find out the relationship between the social media networks and rural India’s development and also critically examines why majority of rural India. Development is not a linear process but a multidimensional exercise. Even the rural India defies any definition. There have been many initiatives by Indian government and also many UN programs have been implemented in Indian villages.

Besides that, many private social networks have taken the initiative like various NGOs, news channels, various web sites etc. As observed in many scenarios, development in Asia and Africa is not as systematic as the industrial development in Europe. That’s the reason when rural areas of India still face issues like sanitation, public health care etc., social media finds a relevant place. Diverse social and infrastructural needs must be addressed more or less *simultaneously* to ensure a nation’s future growth and prosperity. As the paper signifies, Social media has affected all spheres of rural people’s lives: right from their livelihood to their healthcare, from traditions to social campaigns etc.

Many people have defined social media networks from time to time. But broadly, most of the people find social media networks synonymous with social networking sites, micro blogging, various internet forums etc. But as per the study of this paper, social media networks “ have a broader area of definition. Every media whether it is a radio or a news channel or Ngo or any source which



interacts with public at some level, has a social responsibility. This responsibility is very important in nature as it affects the development of the society by large means. Thus, the media cannot shirk from this social responsibility and thus, making all the prominent media networks as the social media networks.

At rural level, folk media has a very significant role and place in people 's lives. Modern day media still appears alien to the rural people. Folk media mainly includes folk songs, folk dances, folk theatre and other folk performing arts. The first significant international recognition of the traditional media in the communication and the development strategies of developing countries came in 1972 when the International Planned Parenthood Federation and UNESCO organized in London a series of meetings on the integrated use of the folk and the mass media in family planning communication programmers.

Every village has its relevant music, dance or theatre. The folk arts cater to the needs to the local people and are in accordance with the changing traditions of the society. Traditional folk forms in India can be effectively used for social developmental communication. The communication potential of Indian traditional performing art has been proved time again and again by many instances of national importance. One can find such examples in every state of India where through awareness is created through folk dances, folk songs or through folk theatre. The outcome of various researchers has established the importance of rural media in development communication. Traditional uses of folk media were primarily for entertainment, social communication and persuasive communication.

International commission for the study of communication problems, the commission, also popularly known Mac bride Commission, was established by UNESCO to study among issues as increasing importance attached to communication as a social phenomenon and the consequent interest shown in the development communication. The limiting factor in case of mass media is that it appears glamorous, impersonal and unbelievable to the rural people whereas the traditional media are close to the hearts and minds of the people, so their appeal is at personal and intimate level. Folk media can overcome the language barriers and can appeal to the emotions and thus souls of the rural people.

The present electronic era has brought several pros and cons. The electronic era not only provided better, faster and improved working ability of young people, but also an emergence and new form of disorder in Indian youths. Since last decade, the over utilization of social media is an ongoing activity which is increasing at an alarming rate and leading to addiction form among Indian young people which is a serious concern. Problems arriving from over utilization of social media have

been documented worldwide including in India, where the use of the social media has increased noticeably.

It is observed through the studies, that the social media is more addictive among the youths, over utilization of it has been referred to as behavioural addiction and one's inability to avoid being online to the point where it effects the users life, relationships, emotions users' social life etc. There are various forms of social media addiction, such as forming online friendship, accessing pornography, gaming, online shopping etc. It is observed that, over utilization of social media, refrain from participating in real life activities, young people lives mostly in the virtual than in real life. Through this study an attempt has been made to highlight the negative and positive effects of social media on the Indian youths and their opinion about social media.

### **11.27 Social Media and Rural Society**

The aim of this paper is to focus on the impact of social media on rural India. This paper will also try to define social media, how rural development can be through Social Network Services (SNS) and various platforms that have succeeded on SNS while also looking at the practicality of these services. It is important however to define social media to not restrict the field only to SNS provided through the internet via Facebook, twitter, etc but it also diminishes the work done by many NGO's which have programs which also utilize the same idea of networking as Face book or twitter. There also is a need to know the precise definition of social media, as it can also be looked at from a different perspective. The definition of social media has changed over a period of time, has broadened and explained by many scholars through various perspectives. Though most of the people, speaking on a majority scale, believe that social media network is linked heavily with social networking sites, micro blogging, various internet forums etc. This paper will look at the broader aspect of social media networks where its definition isn't restricted to only a few platforms.

Any and every media which has to interact with the public at some level, be it an NGO or radio or television, all of them have a social responsibility. This responsibility is very important in nature as it affects the development of the society by large means. Thus, the media cannot shirk from this social responsibility and thus, making all the prominent media networks as the "social media networks. The mass media (radio, television, newspaper and magazines) are indispensable, enabling citizens to have their voices heard and opinions expressed, it is a powerful tool. The essence of media should be to involve the citizens in decisions regarding development plans, and to spread the knowledge of these decisions to various parts. There is a considerable difference in media among regions and countries, and between cities and rural areas. We hope to focus on the latter. The latter focuses on the fundamental problem with rural India, which is rural development.

So the role of media becomes extremely important and key to a lot of citizens in these areas where the benefits of internet have not yet been reaped.

But what is rural development? Rural development in general is used to denote the actions and initiatives taken to improve the standard of living in non-Urban neighbourhoods, countryside, and remote villages. These communities can be exemplified with a low ratio of inhabitants to open space. Agricultural activities may be prominent in this case whereas economic activities would relate to the primary sector, production of foodstuffs and raw materials.

After much clarity in the understanding of the two key terms – Social Media and Rural Development, we can look at the various plays through which both of these terms are linked and also try to follow the nature of their relationship. Differentiation of modern day media and traditional media has been discussed very closely. The paper aims to discuss various fields where social media has affected rural people's lives and also of the fields where media has been lacking in its role.

### **11.28 Effect of Social Media**

The Indian society is an elaborate society with multi cultures, multi tribes and castes, multi lingual and the disparities between the urban and rural people. Since the birth of independent India, there is no denying the fact that India has grown as a nation and as economy rapidly with major growths from infrastructure to public health care, from communication sector to IT field and much more. But development is not a linear process but a multifaceted system with a complex idea. Even the rural India defies any definition of development. The Indian government has started many initiatives which have tried to encompass the large Indian crowd and while also many UN programs have been put to use in Indian villages. Besides that, many private social networks have taken the initiative like various NGOs, news channels, various web sites etc. But unlike Europe's systematic Industrial growth, Asia and Africa still remain largely unaffected by the model due to the large size of many nations with no connectivity. India goes through a similar problem. That's the reason when rural areas of India still face issues like sanitation, public health care etc., social media finds a relevant place. Diverse social and infrastructural needs must be addressed more or less simultaneously to ensure a nation's future growth and prosperity. Social media has affected all spheres of rural people's lives: right from their livelihood to their healthcare, from traditions to social campaigns etc. Time and time again SNS have found a way and have realized their potential to become pioneers in rural development.

Among the several mass media, newspaper and farm magazine are commonly used. They have a vital role to play in the communication of agricultural information among the literate farmers. Increasing rate of literacy in the country offers new promises and prospects for utilizing print

medium as a means of mass communication. Agriculture journalism is a new field in India and is growing rapidly as the food giver of India is becoming literate now. Through online public grievance system, development in these parts take place smoothly as the villagers can lodge their complaints on this forum. This initiative has aided rural people a lot. Though it is naive to think that electricity, telephony and connectivity in rural areas will spread if the demand does not grow of these resources.

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Social media has affected all spheres of rural people's lives: right from their livelihood to their healthcare, from traditions to social campaigns etc. Time and time again SNS have found a way and have realised their potential to become pioneers in rural development. Many Indian social media networks have committed themselves to provide information to the farmers regarding cultivation as well as animal husbandry especially All India Radio (AIR) which has been committed to rural audience for more than 50 years now. Among the several mass media, newspaper and farm magazine are commonly used. They have a vital role to play in the communication of agricultural information among the literate farmers. Increasing rate of literacy in the country offers new promises and prospects for utilizing print medium as a means of mass communication. Agriculture journalism is a new field in India and is growing rapidly as the food giver of India is becoming literate now.

Through online public grievance system, development in these parts take place smoothly as the villagers can lodge their complaints on this forum. This initiative has aided rural people a lot. Though it is naive to think that electricity, telephony and connectivity in rural areas will spread if

the demand does not grow of these resources. In addition, information networks can become conduits that allow money to flow into the village through new kinds of non-discriminatory and clean industries. Information and communications technologies can also compensate for other kinds of infrastructure limitations. For example, if online work, trade, or payment were to become available for members of a village community, the poor quality of roads to and from that village becomes less of an obstacle to earnings and employment. Finally, and most importantly, if capital were to become more readily available within a village community through such networked systems, it would then be in a better position to finance the basic infrastructure that it needs, including roads, dispensaries, and water and sanitation systems.

But there has been a critical problem, the problem has been of digital divide. The global digital divide describes the unequal distribution of information and communication technology across nations, commonly described as the “gap between the information haves and have-nots.” The contours of the global digital divide are complex and, although the “digital divide” has become a common political catchphrase, popular discourse has, for the most part, failed to capture all of the dimensions of the divide.

The Internet has transfigured the way most people in the West live. It has become an important part of our economic, political, and social lives, changing the way we purchase commodities, the way we bank, and the way we share exchanges with one another. First, the Internet reduces traditional blockages to trade and industry, allowing small businesses in developing nations to market their products directly to the United States and other developed countries. Second, the informational capacity of the Internet enabled developing countries to move ahead in improving fundamental services. It can allow, with its use, people all across to access information from any part of the world. The only way in India to reduce this divide is by providing the rural people with adequate information on the internet and its uses explained. But there would be people on the internet looking to cash in for the naïve nature of new internet users. But amongst many limitations, digital divide is said to be only temporary as technology would become redundant in developed nations and the third world countries would be able to produce this technology for cheaper rates, they would also be able to improve their existing technology. These gaps in connectivity is due to the economic disparity of different nations, whereas some nations have tried to improve this connectivity but there are many pressing issues in third world countries, for instance, irregular electricity supply.

The problem then lies with the fact that rural India needs platforms where they could express their grievances, like, online public grievance. Social media can provide this platform where their voices and their culture is protected, looked after. In today’s global economy, where computers and the Internet are so fundamental to production and participation, it is clear that if the right to

development is to be taken seriously, that right must encompass the development of information connectivity technology infrastructure and skills. It is also very important to look at the various platforms which have helped rural India, where there was definite impact made on the lives of the people.

### **11.29 Potential of Social Media as a Rural Development:**

The worldwide goal is the sustainable growth of job, poverty reduction, and equitable development. The social media potential of India performing communication networking has been proved time and again by many instances of national information importance. It has been seen that social media or ICT is playing a 'catalytic' role in developing rural area. ICT means all technologies used for communication and information purpose. It includes all type of media like internet, TV, radio etc. It is a basic infrastructure tool for economic and social development of a country. Realizing the importance and powerfulness of social media, it is used in rural development for agricultural activities like proper guidance to the farmers about use of fertilizers; how much amount of fertilizer should be added, to the nature of soil, for which crop the soil is more beneficial. The technology is too beneficial in the increment of yield of crops due to which the farmers will be in profit. Agriculture researchers of developing countries are also believed that social media are important tool to disseminate their findings.

India provides an interesting case on the use of social media in agriculture named AGROPEDIA: an online agricultural knowledge repository. It is unique web 3.0 platform in agricultural domain. It enables us in getting exactly the same information for which we are looking for. It is the first of its kind in the world with the capability of searching semantically enabled information. Agropedia seeks to address lacunae in Indian agriculture knowledge and applications. Any user who registered to Agropedia can either add, rate or comment on any content in all major Indian languages, this feature makes Agropedia different from the other sites. Agropedia has various section: Agrowiki, Agroblog, Agroforum, Agrochat or Images.

Agrowiki: Developed by using the concept of Wikipedia i.e. socially co-creating content. Everyone is able to search and create content regarding agriculture, and share it with his or her peers.

Agroblog: A Platform where one can record his or her agriculture-based experiences and stories. Generally, on Blogs an individual can record their opinions, information, etc., on daily basis and hence the name "AgroBlog" was devised to represent agricultural based opinions and experiences.

Agroforum: A crop based Question & Answer forum of Agropedia

### **11.30 Uses of Social Media for Rural Management**

1. **World Wide Connectivity:** Nowadays peoples are connected with the social media updating the information and uploading the photograph. No matter if you are searching for a former college roommate, your first grade teacher, or an international friend, no easier or faster way to make a connection exists than social media. Although Face book, Twitter and LinkedIn are probably the most well-known social networking communities, new websites are popping up regularly that let people connect and interact over the web.

2. **Commonality of Interest:** Everyone wants to access the social media networking sites. When you opt to participate in a social network community, you can pick and choose individuals whose likes and dislikes are similar to yours and build your network around those commonalities.

3. **Real Time Information Sharing:** The plenty of social networking sites incorporate an instant messaging feature, which lets people exchange information and communication in real time via a chat. This is a great feature for teachers to use to facilitate classroom discussions because it lets them utilize the vast store of information available on the web. This can be a great time saver for the teacher. Since students no longer need to visit a library to conduct the research.

4. **Targeted Advertising:** Nowadays advertising the activity is pivotal role of in this society. Whether you are non-profit organization that needs to get the word out about an upcoming fundraiser or a business owner marketing a new product or service, there's no better way than social media to get your message in front of millions of people 24/7.

5. **Increased News Cycle Speed:** Undoubtedly, social networking has evolved revolutionized the speed of the news cycle. Most news organizations now rely on social media sites to collect and share information. Social media especially twitter is steadily becoming a mainstream source for breaking news. Today an individual can know, in real time, what is happening throughout the universe.

6. **Trusted Referrals:** Review sites such as search engines Google reviews, Face book have become a popular social media source of information for consumers and peoples. These sites create platform for social individual proof looking at input from other consumers about the value of a product or service. Over 90.00 percent of consumers today use social review sites when making a decision on a buying a product or hiring a service.

7. **Professional Growth:** Foundations growth of the each and every individual of life is significant traits. In this context most of the peoples wants to live their life in pompous way and make income lucrative manner. Not only are there many groups for people to discuss their interests but there have been a huge growth in chat rooms, forums and groups focused on professional growth. Today you can find a group that focuses on just about any profession or educational pursuit and seek out help from others around the globe.

**8. Increase the Human Interaction:** Communication plays a major role of human beings and animal life it starts from sender and end with receiver by using various channel medium of life. While many decry the more negative personal aspects of social networking, it has been a huge source of connection to other people for those who have more difficulty with face-to-face interaction.

**9. Benefits for Non-Profits:** Non-profit charities, educational associations and even political groups have found that social networking is a powerful tool for getting one's message out. You can build up exposure and support for a cause through social media, especially if a video or news story goes viral. This has helped many organizations and institutions with small budgets to reach mass audiences they never would have been able to afford to before and bring in higher dollar donations and members to their associations.

### **Questions:**

1. Which type audio visual aids are available for rural development?
2. Write down the functions and limitations of audio visual aids?
3. What do you mean by cross media? Discuss cross media Approaches?
4. List out the tools of cross media? Write down the benefits of cross media?
5. Write down the concept of media and rural development? Discuss the Inter relationship between media and rural development?
6. Discuss the development of networks and forums?
7. Define social media and rural society? Effect of social media on rural society?
8. Discuss potential and uses of social media as a rural development?

### **Suggested Readings**

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