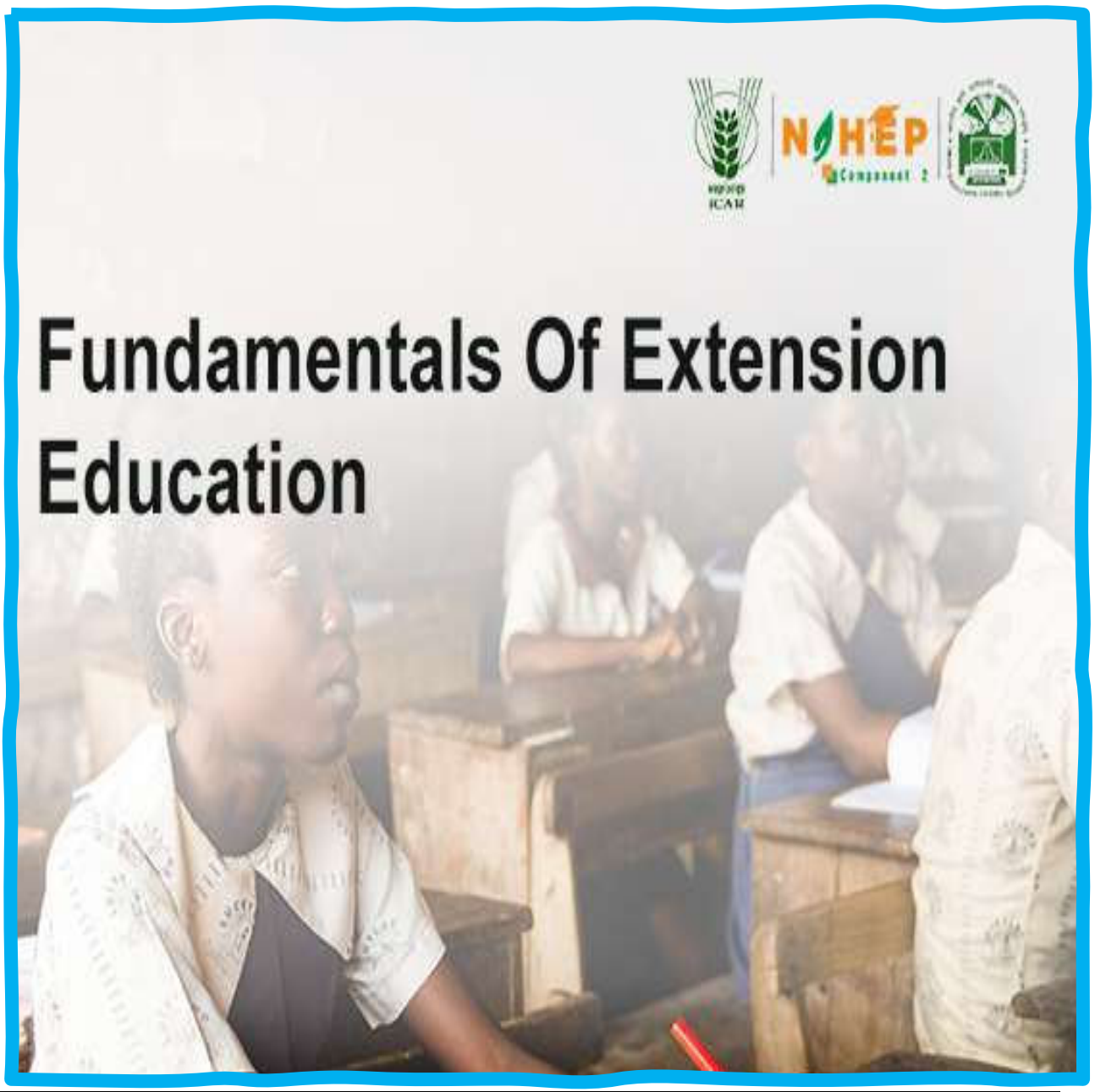
Fundamentals Of Extension Education



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	steps
Lesson 11	Programming planning process: meaning, principles, and steps
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Course Name	Fundamentals of Extension Education
Lesson 1	Extension Education: Meaning, Definition, Nature and Scope
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1.1 Objectives of the Lesson

- to get a basic idea about the meaning, the concept of education
- To explain various types of education
- to understand the meaning, concept, and origin of extension and extension education
- to know the various scope, importance, and nature of extension education

1.2 Glossary

Education: Education is the process of bringing desirable change in the behaviour of human beings

Behaviour: The behaviour of an individual, in a broad sense, refers to anything the individual does.

Non-formal education: It is also organized and systematic educational activity outside the framework of formal education system

Extension: Extension is non-formal education and its purpose is to change attitudes and practices of the people with whom the work is done

Extension education: It is defined as an educational process through which important components of behavoiur (mainly knowledge, skills and attitude) get modified or change to a desirable state

Voorlichting: Refer extension work which means lighting the path

Agricultural extension: It is a professional method of non-formal education aimed at inducing behavioural changes in the farmers

Need: It is defined as a gap between what is the actual situation and what ought to be the desirable situation

1.3. Meaning and concept of education

Extension education is basically an educational process and approach. Education is the most significant and integral part of the extension. Hence basic idea about education is necessary to understand the extension concept in detail.

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The word education is derived from Latin word "*educare"* which means "to *bring-up"*. Education is also derived from another Latin word "*educere "*which means to *lead out "*literally it means leading an individual from ignorance to knowledge.

Webster defined education as the process of teaching to develop the knowledge, skill, or character of the student

It is the process of bringing desirable change in the behaviour of human beings.

Behaviour refers to all the actions or reactions of an organism (person or animal) in response to external or internal stimuli. The behaviour of an individual, in a broad sense, refers to anything the individual does.

Behaviour may be broadly classified into overt behavior and covert behavior.

Overt behavior is externally observable, detectable, and public. Outwardly seen or sensed by an observer. Eg. Anger.

Covert behavior is internal and occurs within the organism that is not readily observable. Eg. Hunger.

Education is the process of giving training or instructions to people to develop their knowledge (things known), abilities (things felt), and skills (things done) which lead to action.

Knowledge or cognitive Eg: An Extension personnel educates a farmer on cultivation practices in coconut (change in knowledge).

Attitude or affective Eg: Extension personnel changes the attitude of a women farmer and makes them adopt rose flower cultivation (things felt)

Skills or psychomotor Eg: Assistant horticultural officer improves skills of a mango farmer on the preparation of mango pickles (things done)

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1.4. Types of education

Methods of education as per the modes of learning, teaching-learning situations, goals etc can be categorized into the following three types. The differences between the three types of education are given in Table 1.1

1.4.1. Informal education: It is a lifelong educational process by which every individual acquires and accumulates knowledge, skills, attitudes, and insights, from daily experiences and exposure to the environment at home, at play, etc

E.g.: Little baby, as she grows up, learns how to recognize her parents and how to eat

1.4.2. Formal education: It is a highly institutionalized, uniform, full-time, chronologically graded, hierarchically structured education system that starts from primary school to university education. E.g.: Education in schools & colleges

1.4.3. Nonformal education: It is also an organized and systematic educational activity outside the framework of the formal education system to provide selected types of learning to particular subgroups of the population, adults, as well as children according to their needs.

E.g.: Extension Education, Adult education. Extension worker improves the skills of papaya farmers in the application of pesticides

Table 1.1: Difference between formal, nonformal, and informal education

criteria	Formal education	Nonformal/Extension Education	Informal education
Concerned with	Educational growth of children and youth preparing them for future	Adults and youth's actual life situations	Incidental learning
Attendance	Is compulsory	is voluntary	Life participation

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Learners	Are relatively more homogenous in terms of their age, educational qualification, experience, knowledge, interests, and needs	Are relatively more heterogeneous in terms of their age, educational qualification, experience, knowledge, interests, and needs also vary with value systems, cultural background etc	Individual learning process
Preconceived ideas	Learners do not generally have any preconceived ideas solving	Learners generally have preconceived ideas and notions because of their past experiences	May or may not have preconceived ideas
Curriculum	Fixed & has pre-decided subjects. Students should adapt themselves to the curriculum offered	No fixed curriculum and it is flexible to meet the diverse needs and demand of learners	On-the-spot, issue-based learning
Teaching	Is more formal in class rooms, prescribed text books, and examinations	Is more informal without any fixed venue and textbooks, timings and examinations, it is specific and problem-oriented	No teacher (self learning)
Mode of instruction	Vertical, from teacher to student. More instructive in nature	Horizontal. Shared learning between teacher and learner	Intra-personal learning
Method of learning	Starts with theory, followed by practical	Starts with practical and goes on to theory	Real-time learning

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Teacher	Is older and experienced than the learners	May be younger and inexperienced than the learners	No teacher

1.5 Meaning of Extension

The term extension has its origin in **the Latin word**, *tensio*, meaning, stretching, and *ex,* meaning outward. The literal meaning of extension is stretching out.

Extension means stretching out beyond the boundaries of universities and research stations to reach the rural people to educate them on various ideas, information, and innovation as per their interest and need.

In other words, the word 'Extension' used in this context signifies an out–of–school system of education. And the word extension is commonly used to understand how "to extend" the new ideas, and practices.

Extension connotes different meanings in different countries. In the USA the term extension is used as Cooperative extension which indicates teaching people to solve problems themselves

Dutch people use *Voorlichting* to refer to extension work which means lighting the path while French call extension *Vulgarization* means Simplification

German people use *Berating /Aufklarunge / Erziehung* which convey the meaning of Advisory work/Enlightenment/Education whereas Spanish call *Capacitacion* means improving skills

1.6 History of Extension Education

The word "Extension" was first time used to describe the concept of taking teaching and learning outside the walls of a university in the form of "University Extension" or "Extension of the University" in Britain in 1840. Many scholars and academics in Europe and elsewhere used the word Extension to describe the concept of extending university education to the

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working masses, who by the virtue of their work could not be on the university campus to obtain a university education.

In his report entitled “suggestions for the Extension of the university” James Stuart of Trinity College, Cambridge University in 1866, used the word extension when he was addressing “Women Association and Working Men’s Clubs” of North England.

In a formal way, Cambridge University in 1873, London University in 1876 and Oxford University in 1878 developed the Extension system, which worked among people. In 1880, James Stuart work came to be known as the “Extension movement”. His effort regarded him as “Father of University Extension”.

The word ‘extension’ came to be used in USA during 1914 which means “a branch of a university for students who cannot attend the university proper”

In India, the teaching of extension education at undergraduate level started in 1950 at the college of agriculture in Calcutta University.

The first postgraduate teaching was launched in 1955 at Bihar Agricultural college ,Sabour followed by the College of Agriculture,Nagpur in 1958.

On the expert advice from Pioneer in extension education J Paul Leagans , IARI, New Delhi started a separate Department in Agricultural Extension, as well as the introduction of Ph. D. program, which was a landmark event in 1961.

In India, the university extension gained momentum with the establishment of the State Agricultural Universities (SAUs) on the pattern of Land-Grant colleges in the US. The first SAU was established in Pantnagar in 1960, followed by OUAT at Bhubaneswar in 1962.

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1.7 Definition of Extension and Extension Education

According to **Ensminger (1957)** extension is education and its purpose is to change the attitudes and practices of the people with whom the work is done.

Leagans (1961) conceptualized extension education as an applied science consisting of content derived from research, accumulated field experiences, and relevant principles drawn from the behavioural sciences synthesized with useful technology into a body of philosophy, principles, content and methods focused on the problems of out-of-school education for adults and youth.

Extension education is defined as an educational process to provide knowledge to the rural people about the improved practices in a convincing manner and help them to take decision within their specific local conditions **- Dahama (1973).**

The National Commission on Agriculture (1976) refers to extension as an out-of-school education and services for the members of the farm family and others directly or indirectly engaged in farm production, to enable them to adopt improved practices in production, management, conservation, and marketing.

Extension Education is an out-of-school system of education in which adult and young people learn by doing. It is partnership between the Government and the people, which provides service and education designed to meet the needs of the people. Its fundamental objective is the development of the people. – **Kelsey and Hearne (1963)**

We can define Extension Education as the increased dissemination of useful knowledge for improving rural life. – **Butt (1961)**

Extension Education is a two-way channel; it brings scientific information to the village people and also takes the problems of the village people to the scientific institution for solutions. It is a continuous educational

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process, in which both learner and teacher contribute and receive. – **B. Rambhai (1958)**

Singh (1980) defined Extension Education is an applied science, the knowledge of which is applied to bring about desirable changes in the behavioural complex of human beings usually through various strategies and programmes of change and by applying the latest scientific and technological innovations.

Agricultural Extension is a professional method of non-formal education aimed at inducing behavioural changes in the farmers for increasing their income through increased production and productivity by establishing firm linkages with research for solving farmer's problems ensuring adequate and timely supply of inputs and using proven methods of communication for speeding of the process of diffusion and adoption of innovations. -*Y.C. Sanoria*

Agricultural extension may be defined as a special branch of Extension Education which deals with the economic and social aspects of people engaged in or associated with agriculture. -***National Commission on Agriculture, 1976***

1.7.1. Summary of the definitions

1. It is a non-formal education system.

2. It is an applied behavioural science.

3. It aims at socio-economic development of the individual and the community.

4. It is applied for bringing desirable changes in the behavioural complex of the people.

5. It provides linkage between extension personnel, researchers, and clients (farmers and rural people).

6. It gathers, processes, stores and disseminates information.

7. It is people-oriented, knowledge-based, and problem-focused.

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1.8 Nature/distinguishing features of extension education

1. It is a continuous as well as an out-of-school system of education
2. Adults and youths are the target audience
3. It includes the application of knowledge
4. Process of Learning by doing and seeing is believing
5. It is a cooperative, social intervention process
6. Involvement of lay leaders
7. It relates to rural situations and agroecosystems.
8. Directed to felt needs that have greater flexibility
9. Wider variety of teaching procedures
10. Two-way way communication and dynamic process
11. It is a Co-coordinating and integrating process
12. It is applied behavioural science (J.P. Leagans)
13. Extension education is a science as well as a profession

1.9 Scope of Extension Education

Scope generally refers to the areas, opportunities or limits in which after acquiring basic knowledge one can put into action for his betterment. The dictionary meaning of 'scope' is 'space for action'. Extension education has vast scope in present situations as most of the country mainly depends upon rural and agricultural development.

Extension appears to have unlimited scope in situations where there is need for creating awareness amongst the people and changing their behaviour by informing and educating them. Kelsey and Hearne (1967) identified nine areas of programme emphasis, which indicate the scope of agricultural extension.

1. Efficiency in agricultural production.

2. Efficiency in marketing, distribution and utilisation.

3. Conservation, development and use of natural resources.

4. Management on the farm and in the home.

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5. Family living.

6. Youth development.

7. Leadership development.

8. Community development and rural area development.

9. Public affairs

Extension is an integral part of agricultural and rural development which enhances the production in agriculture, horticulture, animal husbandry, veterinary, fishery, social forestry, sericulture, etc., with the help of extension service.

The following statements will further amplify the scope of extension.

1. Extension is fundamentally a system of out-of-school education for adults and youths alike. It is a system where people are motivated through a proper approach to help themselves by applying science in their daily lives, in farming, homemaking, and community living.

2. Extension is education for all village people.

3. Extension is bringing about desirable changes in the knowledge, attitudes and skills of people.

4. Extension is helping people to help themselves.

5. Extension is working with men and women, boys and girls, to answer their felt needs and wants.

6. Extension is teaching through learning by doing and seeing is believing.

7. Extension is working in harmony with the culture of the people.

8. Extension is a two-way channel; it brings scientific information to village people and it also takes the problems of the village people to the scientific institutes for solution.

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9. Extension is working together (in groups) to expand the welfare and happiness of the people with their own families, their own villages, their own country and the world.

10. Extension is development of individuals in their day-to-day living, development of their leaders, their society and their world as a whole.

1.10 Importance of extension education

- Extension uses democratic methods in educating the farmers.
- Extension Helps in adoption of innovations.
- Extension helps in studying and solving the rural problems.
- Extension increases farm yields and improve the standard of living of farmers
- Extension makes good communities better and progressive.
- Extension contributes to national development programmes

1.11 Need for Extension

The need for extension arises out of the fact that the condition of the rural people in general, and the farm people in particular, has got to be improved. There is a gap between what is – the actual situation and what ought to be – the desirable situation. This gap has to be narrowed down by the application of science and technology in their enterprises and bringing appropriate changes in their behaviour.

You cannot apply yesterday's methods today and be in business tomorrow. The need upgrades the knowledge, skills and understanding especially for the development of rural economy as its major component of agriculture and to keep the with the brisk changes characteristic of modern times. In other words, the rural people should know and adopt useful research finding from time to time, and also transmit their problem to the research workers for solution.

According to Supe (1987), the researchers neither have the time nor are they equipped for the job of persuading the villagers to adopt scientific methods, and to ascertain from them the rural problems. Similarly, it is

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difficult for all the farmers to visit the research stations and obtain first-hand information. Thus, there is need for an agency to interpret the findings of research to the farmers and to carry the problems of the farmers to research for solution. This gap is filled by the extension agency

1.12 Concept related to extension

Extension education is a science that deals with the creation, transmission, and application of knowledge designed to bring about planned changes in the behavior complex of people, with a view to helping them live better by learning the ways of improving their vocations, enterprises, and institutions.

Extension service: An organization and or a program for agricultural development and rural welfare which employs the extension process as a means of program implementation.

Extension process: The extension process is that of working with rural people through out of school education, along those lines of their current interests and needs which are closely related to gaining a livelihood, improving the physical level of living of rural families, and fostering rural community welfare.

Extension Job: The job of extension in agriculture and horticulture is to assist people engaged in farming to utilize more fully their own resources and those available to them, in solving current problems and in meeting changing economic and social conditions.

Extension Agency: The agency that plays the dual role of interpreting the results of research findings or outcomes to the farmers (in such a way that they accept and adopt the recommendations) as well as conveying the farmers' problems to the research stations for solutions is called as Extension Agency. The personnel manning this agency are called as extension personnel or agents or workers. This extension personnel is trained adequately in formal educational institutions to perform the job of extension. Thus, three kinds of interrelated services research,

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education, and extension are essential in the process of rural development.

In other words, through the educational and services approach rural people are stimulated to make changes that result in more efficient production and marketing of farm products, conservation of natural resources, more comfortable homes, improved health, and more satisfying family and community life.

The modern concept of Extension education is as a means for achieving community development, and includes several facets and subject-matter fields, of which agriculture is more important than the others.

Hence "Agricultural extension" may be defined as a special branch of Extension Education that deals with the economic and social aspects of people engaged in or associated with agriculture. Horticultural Extension may be defined as the specialized branch of agricultural extension which primarily deals with horticultural development.

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Lesson 2	Extension Education: Objectives, Principles and Approaches
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
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2.1 Objectives of the Lesson: -

- to get acquainted with the various objectives viz; fundamental and general of extension education
- to learn about various functions and philosophy of extension education
- to explain the various principles of extension education
- to know about different approaches related to extension education

2.2 Glossary

Objective is a statement of change in knowledge, feeling or action we want to bring about in people

Philosophy is a body of general principles or laws of a field of knowledge

Principles are generalized guidelines, which form the basis for decision and action in a consistent way

Extension approach is the style of action based the philosophy and principles of an extension

General Objectives are more definite and specific objectives than fundamental objectives

Need is a difference between what is and what ought to be

2.3 Objectives of extension

Objectives are expressions of the ends towards which our efforts are directed. In other words, an objective is a statement of change in knowledge, feeling or action we want to bring about in people.

Some extension workers like to make a distinction between the meaning of “objectives” and “goals”. Objectives are defined as “directions of movement”, while a Goal is defined as the distance in any given direction one expects to go during a given period of time.

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The fundamental objective of extension is the development of the people or "the Destination Man" mentioned in the context of Community Development in India.

2.3.1 General objectives of Extension

1. To assist people to discover and analyse their problems their felt and unfelt needs.

Need is a difference between what is and what ought to be. It is the lack of something. Need is what one desires

Felt needs/recognized needs are that existence the people are aware and feel necessity of fulfilling them. Example of felt needs: Low yields in potato- due to low yielding varieties, pest and diseases

Unfelt needs/Unrecognized needs are those whose necessity the people don't realize at present, but these none the less are important. Examples of unfelt needs: low yields in banana- water shortage at fruit ripening stage

2. To develop leadership among people and help them in organizing groups to solve their problems. Ex formation of commodity interest groups, SHGs etc

3. To disseminate information based on research and / or practical experience, in such a manner that the people would accept it and put it into actual practice. Ex: Transfer of IPM in brinjal through training programmes and demonstrations

4. To keep the research workers informed of the people's problems from time to time, so that they may offer solutions based on necessary research. Ex: shoot and fruit borer in brinjal ,BLB disease in paddy, Heliothis in cotton, wilt in tomato, Non-performance of conoweeder in heavy black soils etc.

5.To assist people in mobilising and utilizing the resources which they have and which they need from outside. Ex. Formation of guava seller group in among the guava grower of the locality.

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The major objectives of Extension may also be categorized as follows.

(i) **Material** – increase production, productivity, income. To develop skills

(ii) **Educational** – change the outlook of people or develop the individuals.

(iii) **Social and cultural** – development of the community. To develop leadership

2.3.2 Levels of objectives

1. **Fundamental objectives**: These are all-inclusive objectives in extension, e.g., the fundamental objective of extension work is development of man or the full development of individuals. Such objectives are generally found in legislation and charters of organization e.g. Good life, better citizenship, democracy etc.

2**. General Objectives**: These are more definite (specific) than fundamental objectives, and are directly associated with Extension Service and are generally found in statements of policies and purposes. E.g. helping rural people to have better home living.

3. **Working Objectives**: In these specific subject-matters approach is focused at individual or group. Ex: To improve farmers knowledge on cut flower cultivation

Working objectives have three Parts-Audience-Who are to be changed, Type of Change-Knowledge, attitude or skill, Content or message-- What are you trying to teach (What you want them to know, feel or do)

The main aim of extension is human resource development.

According to the National Commission on Agriculture (1976), agricultural extension aims at improving the efficiency of the human capital in an effort to rapidly increase the rate of agricultural production. The agricultural extension programme seeks to impart the necessary skills to the farmers for understanding improved agricultural operations, to make available to them timely information on improved practices in an easily

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understandable form, suited to their level of literacy and awareness, and to create in them a favorable attitude for innovation and change.

2.4 Functions of Extension

Keeping the objectives in view, the function of extension is to bring about desirable changes in human behaviour by means of education. Changes may be brought about in their knowledge, skill, attitude, understanding, goals, action and confidence.

Change in knowledge means change in what people know. For example, farmers who did not know of a recent HYV crop came to know of it through participation in extension programmes. The Extension Agents (EAs) who did not know of Information Technology (IT) came to know of them after attending a training course.

Change in skill is change in the technique of doing things. The farmers learnt the technique of growing the HYV crop which they did not know earlier. The AHOs learnt the skill of using IT.

Change in attitude involves change in the feeling or reaction towards certain things. The farmers developed a favourable attitude towards the HYV crop. The EAs developed a favourable feeling about the use of IT in extension programme.

Change in understanding means change in comprehension. The farmers realized the importance of the HYV crop in their farming system and the extent to which it was economically profitable and desirable, in comparison to the existing crop variety. The EAs understood the use of IT and the extent to which these would make extension work more effective.

Change in goal is the distance in any given direction one is expected to go during a given period of time. The extent to which the farmers raised their goal in crop production, say, increasing crop yield in a particular season by five quintals per hectare by cultivating the HYV crop. The EAs set their goal of getting an improved practice adopted by the farmers within a certain period of time by using IT.

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Change in action means change in performance or doing things. The farmers who did not cultivate the HYV crop earlier cultivated it. The EAs who earlier did not use IT in their extension programmes started using them.

Change in confidence involves change in self-reliance. Farmers felt sure that they have the ability of raising crop yield. The EAs developed faith on their ability to do better extension work. The development of confidence or self-reliance is the solid foundation for making progress.

To bring desirable change in behaviour is the crucial function of extension. For this purpose the extension personnel shall continuously seek new information to make extension work more effective.

2.5 Philosophy of extension education

Philosophy is a body of general principles or laws of a field of knowledge; it provides guidelines for performing the activities in life in a particular way. The word philosophy is derived from two Greek words 'Philos' and 'Sophia'. 'Philos' means knowledge and 'Sophia' means manner. Philosophy is the pursuit of wisdom, a body of general principles or laws of a field of knowledge. Philosophy of a particular discipline would furnish the principles or guidelines with which to shape or mould the programmes or activities relating to that discipline.

The philosophy of extension work is based on the importance of an individual in the promotion of progress for rural people and for the nation. Different individuals have different philosophies of life, e.g. the traditional minded farmer and progressive farmer may react differently to the concept of artificial insemination of cows.

Philosophy of extension education includes the principles or guidelines with which to shape or mould the developmental programmes relating to that field. It provides to extension worker the basis for working out the programmes and the policies to be adopted in extension work.

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According to Kelsey and Hearne (1967), the basic philosophy of extension education is to teach people how to think, not what to think.

According to Mildred Horton the principles of extension philosophy are:

- the individual is supreme in a democracy
- the home is the fundamental unit in a civilization
- the family is the first training group of the human race
- The foundation of any permanent civilization must rest on the partnership of man and land (nature).

According to Ensminger (1962), extension philosophy can be expressed as

- changing attitudes, knowledge and skills of the people
- working with men and women, young people, boys and girls to answer their needs and wants
- helping people to help themselves
- Extension is “learning by doing and seeing is believing”.
- Extension is development of individual and their society.
- Extension is living relationship, respect and trust for each other.
- Extension is working in harmony with culture of the people.

According to Dahama (1965)

- Self-help
- People are the greatest resources
- It is a cooperative effort
- It has its foundation in democracy
- It involves a two-way channel of knowledge and experience
- It is based on creating interest by seeing and doing
- Voluntary, co-operative participation in programmes
- Persuasion and education of the people
- The programme is based on the attitude and values of the people

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2.6 Principles of extension education

Principles are generalized guidelines, which form the basis for decision and action in a consistent way. If extension workers aspire to becomes an administrator or a supervisor, it will be all the more necessary for him to possess a sound knowledge of the principles of extension.

2.6.1 Principle of interests and needs: interest and needs of the people are most basic guideline for effective extension activities. Many times the interests of the rural people are not the interests of the extension worker. Even though he sees the needs of the people better than they do themselves, he must begin with the interests and needs as they (the people) see them.

In this way only can the extension agency mould the needs and interests of the people into realistic needs. Needs that can satisfy the individuals, groups, community and national interests, needs that can be fulfilled with the available resources should be fulfilled first.

E.g.: Extension work is successful if it is according to people's needs- Demonstration on paddy cultivation in low lying areas and Extension work fails if it is not according to people's needs i.e. Demonstration on potato cultivation in heavy soil areas

2.6. 2) Grass-roots principle: For extension work to be effective and real, it has to be synthesis of democracy obtained at the level of the family and more particularly at the village level. Things must spring from below and spread like grass.

At the same time, modern science calls for an advanced stage of organization of wiser coordination of thinking and action than is feasible in a single family or a single village. Aim of extension should be on local or existing situation. Programmes should start from grass root level.

E.g.: Extension worker should train illiterate farmers initially on marketing aspects rather than training on complicated topic like intellectual property rights.

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2.6.3) Principle of cultural differences: Cultural differences exist between Extension worker and farmer. In order to make extension programmes effective, the approach and procedure must be suited to the culture of the people who are taught.

Different cultures require different approaches. A blueprint of work designed for on part of the globe cannot be applied effectively to another part, mainly because of the cultural differences. These differences can be perceived in the way of life of the people, their attitudes, values, loyalties, habits and customs

. E.g.: A demonstration on poultry farming should not be conducted in a village where all are vegetarian.

2.6.4) **Principle of cooperation and participation**: The participation of the people is of fundamental importance for the success of any educational endeavour. People must share in the development of a programme and must feel that it is their own programme.

E.g.: Success of Annahazare watershed movement in Ralaegoan sidhi is due to people's participation

2.6.5) Principle of learning by doing: Learning by doing involves use of maximum number of senses; hence it is very effective in changing behavior.

Eg : Demonstration on budding technique in rose cultivation is very effective than lecture method. In extension work, farmers should be encouraged to learn new things by doing and by direct participation.

2.6.6) **Adaptability principle in the use of extension teaching methods**: No single extension teaching method is effective under all situations. The use of teaching methods must have flexibility to be adapted to the members of a community who differ in age, education, economic status, sex and proneness to change etc.

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Extension agents have found that they need a large number of teaching methods out of which they can select and revise the one effective for the purpose and best suited to the culture of the people.

Eg: LCD power point presentations are not to be used in an interior village where electricity is uncertain, instead posters, charts, live samples can be used.

2.6.7) Principle of leadership: A good rule in extension work is never do anything yourself that you can get someone to do for you. The involvement of leaders in extension programmes is the one single factor that determines the success or failure of those programmes.

Local leaders are the guardians of local thought and action and can be trained and developed to best serve as interpreters of new ideas to the villagers.People believes in local leaders, and work on their advice.

Identifying different types of leaders and working through them is essential for extension. The local leaders are to be trained, and used extensively in the extension programme.

Eg; Farmers gets easily convinced about latest technology if it is adopted by a local leader or progressive famer than taught by an extension personnel.

2.6.8) Whole family principle: The family is the unit of any society. All the members of the family have to be developed equally by involving all of them. The extension programme effects all members of the family, the family members have great influence in decision-making, it creates mutual understanding, it aids in money management, it balances farm and family needs, it educates the younger members etc.

e.g: Preparation of value added products from tomato like tomato sauce, chutney which involves whole family

2.6.9) Principle of satisfaction: Satisfaction of the people is very essential in extension work. Unless the people are satisfied with the end product of any programme, it is not going to be able to run. The end-product of the

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effort of extension teaching, Satisfaction is the key to success in extension work. "A satisfied customer is the best advertisement."

They must continue to act out of their own conviction and that is possible only when they derive full satisfaction through adoption of innovations well suited to their needs and resources.

Eg: If a farmer is satisfied by seeing baby corn cultivation in a exposure visit he tries to adopt it.

2.6.10 Principle of evaluation: Evaluation prevents stagnation. There should be a continuous built-in method of finding out the extent to which the results obtained are in agreement with the objectives fixed earlier. Evaluation should indicate the gaps and steps to be taken for further improvement.

2.6.11Principle of applied science and democratic approach :The extension work is democratic both in philosophy and practice. It believes in persuasion and discussion. The people are provided with number of choices and they are free to adopt or not to adopt. e.g: Evaluation of the prograame viz atmanirbhar bharat by farmers thmesevels

2.7 Extension Approaches

Extension approach (Axinn, 1988) defined as a style of action, embodying the philosophy of an extension system which, by and large determines the direction and nature/style of the various aspects of that system, such as its structure, leadership, program, methods and techniques, resources, and linkages.

Axinn (1988) identified 8 different approaches to extension work. These alternative approaches reflect different objectives, guiding principles which largely influenced by funding pattern, resources availa bility, leadership etc. These are briefly summarized below:

1. General Extension Approach

2. Commodity Specialized Approach

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3. Training and Visit Approach

4. Agricultural Extension Participatory Approach

5. Project Approach

6. Farming Systems Development Approach

7. Cost Sharing Approach

8. Educational Institution Approach

2.7.1. The General Agricultural Extension Approach

These approaches are general ministry based agricultural extension which is characterized as public, multi- purpose, multi functional system.

Planning is done on a national basis by the central government "which knows better than farmers". This is a typical case of top-down planning

The basic assumption with this approach is that technology and information are available which are not being used by farmers, and if knowledge of these could be communicated to farmers, farm practices would be improved.

The purpose is to help farmers increase their production.

Field personnel tend to be large in number and high in cost, with density varying from country to country.

Resources required are also high, with central governments bearing most costs.

Implementation is through a large field staff assigned according to governmental structure throughout the country, managed by the centre.

Success is measured in terms of rate of adoption of important recommendations and increases in national production.

2.7. 2. The Commodity Specialized Approach

The way to increase productivity and production of a particular commodity.

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To group all functions relating to it under one administration, including extension along with research, input supply, output marketing, and Extension programme planning is controlled by a commodity organization.

Implementation is through field staff of that organization.

Resources tend to be provided by the commodity organization.

Highly trained scientific personnel equipped with expensive vehicles and field scientific apparatus are employed

The measure of Success is usually the total production of the particular crop.

2.7.3. The Training and Visit Approach-

Regular training of the subordinate extension workers and visit to the field as well as to higher authority is the key principles of this approach.

Under Ministry of Agriculture extension services, the extension workers are poorly trained, lacking supervision and logistic support, and they do not visit and have contact with farmers. Further, it is assumed that subject matter specialists are poorly trained and not providing a link with research and training functions.

So the purpose is to induce farmers to increase production of specified crops

Programme planning is centrally controlled, and reflects interaction between research and extension personnel.

Implementation efficiently is sought through a rigid pattern of visits of farmers and training of field staff, along with strict discipline of daily and fortnightly activities with funds from international 6 sources.

Success is measured in terms of production increases of the particular crops covered by the programme.

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2.7.4. The Agricultural Extension Participatory Approach

It is assumed that farming people have much wisdom regarding production of food from their land, but their levels of living could be improved by learning more of what is known outside.

It further assumes that effective extension cannot be achieved without the active participation of the farmers themselves, as well as of research and related services.

There is a reinforcing effect in group learning and group action.

Extension efficiency is gained by focusing on important points based on expressed needs of a farmers and by reaching more small farmers through their groups/organizations instead of through individualized approaches.

The purpose is to increase production and consumption and enhance the quality of life of rural people.

Programme planning is controlled locally, often by such groups as farmers' associations where farmers' associations do not exist, the extension staffs assist to form them. Eg. Farmers Research Group.

Implementation is through group meetings, demonstrations, individual and group travel, and local sharing of appropriate technologies.

Success is measured through the numbers of farmers actively participating and benefiting, as well as continuity of local extension organizations.

2.7.5. The Project Approach

This approach assumes that a rapid agricultural and rural development is necessary and that the large government bureaucracy in the regular Ministry of Agriculture Extension Service is not likely to have a significant impact upon either agricultural production or rural people within an appropriate time frame, and that better results can be achieved by taking a project approach in a particular location, during a specified time period, with large infusions of outside resources.

The purpose is often to demonstrate what can be done in a few years.

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Implementation typically includes project allowances for field staff, better transportation, facilities, equipment, and housing rather than short run change is the measure of success. (eg. a forestation programme).

2.7.6. The Farming Systems Development Approach

The assumption with this approach is that technology, which fits the needs of farmers, particularly small farmers, is not available, and needs to be generated locally.

The purpose is to provide extension personnel (and through them farm people), with research results tailored to meet the needs and interests of local farming system conditions.

Programme plans evolve slowly during the process, and may be different for each agro-climatic farm eco-system type since they include a holistic approach to the plants, the animals, and the people in a particular location.

Field personnel tend to be highly specialized, relatively expensive, and from outside the area being served.

Implementation is through a partnership of research and extension personnel with each other and with local farmers,

The measure of success is the extent to which farm people adopt the technologies developed by the programme, and continue to use them over time.

2.7.7. The Cost Sharing Approach

The assumption here is that the programme is more likely to fit local situations, and personnel are more likely to serve local people's interests if part of the cost of agricultural extension is paid locally.

It also assumes that farm people are too poor to pay the whole cost, so central and regional governments typically provide most of it.

Helping farm people learn the need to know for self-improvement and increased productivity is the purpose. Control of programme planning is shared by the various levels paying the costs.

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Success is measured by farm people's willingness and ability to provide some share of the cost, individually or through their local government units.

2.7.8. The Educational Institution Approach

In this approach, the assumption is that faculties or colleges of agriculture have technical knowledge which is relevant and useful to farm people.

The purpose is to help those people learn about scientific agriculture.

Programme planning tends to be controlled by those who determine the curriculum of the education institution.

Implementation is through non-formal instruction in groups, with individuals, and with other methods and techniques, sometimes conducted by a college or university with agricultural extension personal of another agency as the main audience.

While considerable resources are required, success is measured by attendance and the extent of participation by farm people in the school's agricultural extension activities.

2.8 References

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Course Name	Fundamentals of Extension Education
Lesson 3	Horticulture Extension: Process and Selected Horticultural Institutes
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
University Name	Kerala Agricultural University, Thrissur

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3.1Objectives of the Lesson

To understand the concept of the Extension Education Process

To learn about various national-level horticultural institutes

To know about the objectives and activities of international horticultural institutes

To learn about the objectives and activities of national and international forest institutes

3.2 Glossary

Horticulture extension may be defined as a specialized branch of agricultural extension which particularly deals with the improvement of farmers' cultivating horticultural crops as an enterprise

Extension Education Process refers to the series of interrelated activities in a specific sequence conducted to bring desirable changes in the participants.

Teaching is the process of arranging situations in which learning takes place

Evaluation is the assessment of the program's objectives or goals

Reconsideration refers to the modification of objectives or methods after evaluation of the target programs

3.3 Horticulture extension

Horticulture extension may be defined as the process of bringing desirable changes in the knowledge, skill, and attitude of farmers mainly associated with horticultural crops

Horticulture Extension is a science that deals with the dissemination of improved horticultural technologies with different extension methodologies

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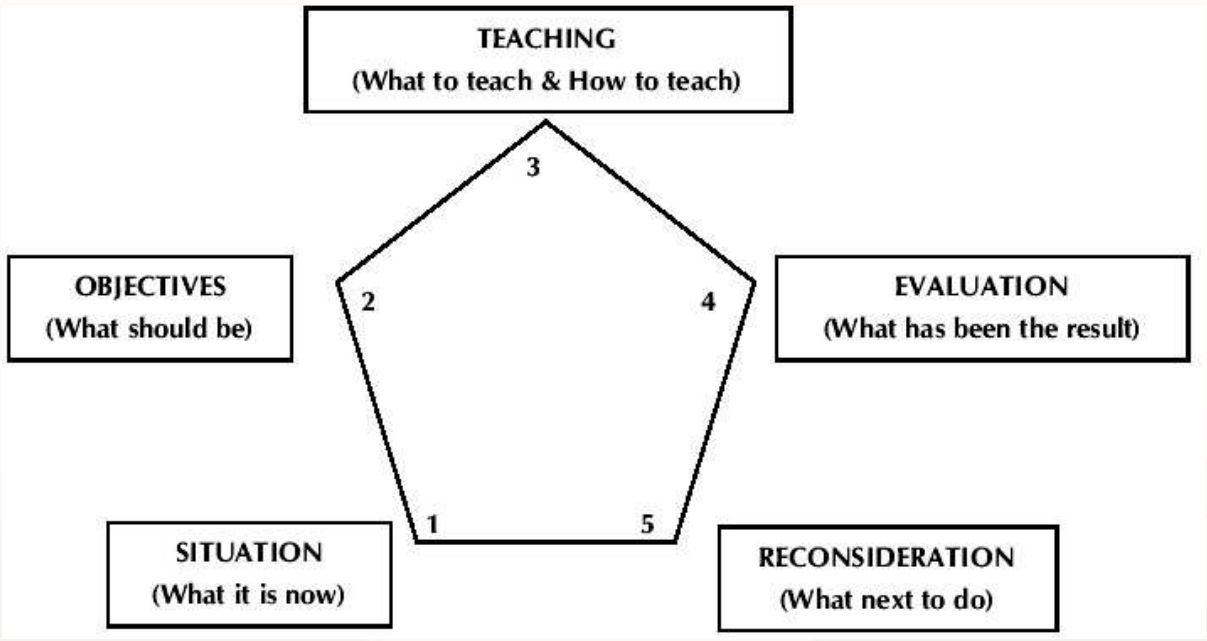
3.3.1 Extension Education Process

Extension education is a participatory process and involves five essential and interrelated steps. The sequence of steps is discussed on the basis of a concept developed by *Leagans (1967)*



The concept of the Extension Education Process was developed by Dr. J. Paul Leagans. According to him, Extension Education takes place as a process; Education starts with the study of the present situation and identification of problems. Based on the problems identified, solutions are found and objectives are formulated. In the third phase, a plan of work is taught on how to attain the objectives, and then the entire process is evaluated and tested whether formulated objectives are attained or not and in the final stage reconsideration about the unattained objectives and unaddressed problems is done. Any Extension work undertaken in villages follows the same path.

I. **The first phase is an analysis of the situation**. This requires a large number of facts about all aspects of the situation. Facts are needed about the people, their interests (horticulture, Agriculture, or Poultry or Agri + Horti), education (Eg: literate or illiterate), what they think they need, their social customs, habits, and folkways.

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Facts are needed about the physical situation such as soils Eg : Red soils , black soils, type of farming(horticulture or Agriculture or poultry), markets (Mandi or regulated market), size of farms(small, medium, marginal or big), cropping systems (vegetables- pulses or fruit crops + vegetables), housing condition (Kucha or pucca houses), community services and communications.

II**. The second phase is deciding upon objectives**. It is necessary to distinguish between levels of objectives by separating the general objectives from the specific or working objectives. The planning process must enable the people to select a limited number of problems and to state their objectives clearly.

The solutions to be offered must give satisfaction. Objectives should express the behavioral changes in people as well as the economic or social outcomes which are desired. Objectives should be decided based on their problems, felt needs, and resources available. If a marginal farmer grows tomatoes, he may be motivated to adopt value adoption for a more sustainable income. Eg. the working objectives may be set viz; the long-term objective is the establishment of post-harvest enterprise and the immediate objective is fruit crops to be grown in the upland area.

III. **The third phase is teaching**. This involves choosing (1) the content or what is to be taught (disease pest Management or fertilizer management or organic farming etc) and (2) methods and techniques of communication (Lecture or Method demonstration or Exposure visit). We must use different methods of communication to stimulate learning as per the audience category. Result demonstration, method demonstration, farmers' training, and farm publications were chosen as teaching methods, and tape recorders and slides were selected as teaching aids. For example, if most of the farmers are illiterate then an exposure visit, Kisan Mela, or demonstration would be fruitful

IV. **The fourth phase is the evaluation of the teaching**. This should determine to what extent objectives have been reached. This will also be

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a test of how accurately and clearly the objectives have been stated. The process of evaluation may be simple and informal or it may be formal and very complex.

In the example, the re-survey after the fixed period indicated that the crop yield had increased by 10 percent. It, therefore, indicated that there was a gap of 10 percent in crop yield in comparison to the target (objective) of 20 percent fixed earlier. The re-survey also indicated that there had been two important deficiencies in carrying out the extension educational program, such as, there was a lack of proper water management and the farmers could not apply the fertilizer and plant protection chemicals as per recommendation due to lack of funds.

V**. The fifth phase is reconsideration after evaluation has taken place**. This step consists of a review of previous efforts and results which reveal a new situation. If this new situation shows the need for further work, then the whole process may begin again, with new or modified objectives. Hence this process is continuous. For example, they were, training the farmers on proper water management practices and putting up demonstrations on water management. The people were also advised to contact the banks for obtaining production credit in time to purchase critical inputs. Thus, the continuous process of extension education shall go on, resulting in the progress of the people from a less desirable to a more desirable situation

3.4 Selected programs of leading national and international horticultural institutes

3.4.1 Indian Institute of Horticultural Research (IIHR)

3.4.1.1 Origin of IIHR

The Indian Institute of Horticultural Research is a premier Institute conducting basic, strategic, anticipatory, and applied research on various aspects of fruits, vegetables, ornamental, medicinal, and aromatic plants, and mushrooms. Popularly known as IIHR, Bangalore, the institute was the

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first Horticultural Research Institute in the country established by the Indian Council of Agriculture Research on 5th September 1967 at the Headquarters of New Delhi.

Subsequently, the institute was shifted to Bangalore in Karnataka at Hessaraghatta located 25 kms away from Bangalore city by taking over the erstwhile existing National Horatorium of Govt. of Karnataka on 1st February 1968 with Dr. G.S. Randhawa as its founder Director.

Established - 5th September, 1967

Institute carved out of IIHR - CISH, Lucknow;

NRC for Citrus, Nagpur; CIAH, Bikaner; HRC, Ranchi,

Number of Division and Sections – 15 (Divisions: 11 and Sections : 04)

Central Horticultural Experiment Stations (CHES) - 3

CHES, Bhubaneshwar, Orissa , CHES, Chettalli, Karnataka, CHES Hirehalli, Karnataka and two KVKs (KVK, Gonikoppa, Karnataka and KVK, Hirehalli, Karnataka)

The Institute has also got an Agriculture Technology Information Centre (ATIC), which is a single window agency for the dissemination of information and technologies developed by the Institute. All the technological products and popular publications developed by the Institute are sold to the farmers and interested public through the agricultural technology information centre.

In the beginning years of the institute, the main research agenda of the institute was to increase the yields of horticultural crop varieties by developing high-yielding varieties in fruits, vegetables, ornamentals, and medicinal and aromatic plants and also develop advanced production technologies to increase the productivity of horticultural crops.

With changing times and the emergence of new challenges in the fields of productivities, crop production, crop protection, and crop utilization, emphasis was laid on breeding varieties for biotic and abiotic stresses

breeding F1 hybrids, developing integrated pest and disease management technologies, developing integrated water and nutrient management protocols towards optimum utilization of resources

Developing Post Harvest Management practices to reduce the post-harvest losses and further value additions and frontier research areas like hi-tech horticulture, precision farming, information technology, and biotechnological interventions to increase yields, protect crops from insect- pests, disease, and viruses, and extension of shelf life of crop produces.

Encompassing various goals and objectives of achieving sustainable development of horticulture, providing livelihood security, economic growth and nutritional security which have been challenged time and again by various obvious factors, the IIHR, Bangalore has been carrying out research in fruits, vegetables, ornamentals, medicinal and aromatic plants and mushrooms with the following mandate:

3.4.1.2 Mandate of IIHR

To undertake research studies on adoption, impact & spread of IIHR technologies in farmers field.

To undertake demonstrations and carry out refinements of IIHR technologies to suit farmer specific conditions.

To provide training to resource persons and key extension functionaries in public and private sector.

To act as single window for publicity, advisory services, distribution and sale of IIHR products through ATIC

3.4.1.3 Services Offered by IIHR

- Trainings
- Sales of IIHR products
- Advisory services

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• Participation in exhibition, demonstrations, trainings, radio talks, TV shows etc.,

3.4.2 Indian Institute of Vegetable Research (IIVR)

Vegetable research was given impetus through establishment of AICRP on vegetable crops during 1971 at IARI, New Delhi with the responsibilities of coordinating and monitoring of vegetable research programmes of the country.

To give a fillip to the research and to meet the challenges of nutritional security, the status of AICRP on vegetable crops was elevated to the level of Project Directorate of Vegetable Research (PDVR) during 1986 with its headquarter at IARI, New Delhi. During 1992, the head quarter was shifted at Varanasi from IARI New Delhi.

Considering the vital role of vegetables in nutritional security, emerging trends of national/ international demand and higher economic return, PDVR was further upgraded to the level of national institute under ICAR system during 1999 and named “Indian Institute of Vegetable Research”.

3.4.2.1 Mandate and objective

To undertake innovative, basic, strategic, anticipatory and applied research for developing technologies to enhance productivity of vegetable crops, their nutrient quality and post- harvest management.

To provide scientific leadership in coordinated network research for solving location- specific problems of production and to monitor breeder seed production of released/ notified varieties and parental lines.

To act as a national repository of scientific information relevant to vegetable crops and as a centre for training for up-gradation of scientific manpower working on vegetable crops.

To develop high yielding, good quality, disease and insect pest resistant varieties/ hybrids of selected vegetable crops.

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To develop advanced production and protection technologies for selected vegetable varieties/ hybrids.

To undertake germplasm collection, maintenance and documentation in vegetable crops.

3.4.3 Indian Institute of Spices Research (IISR)

The Indian Institute of Spices Research (IISR), Calicut a constituent body of Indian Council of Agricultural Research (ICAR) is a major Institute devoted to research on spices. The Indian Institute of Spices Research (IISR), Calicut a constituent body of Indian Council of Agricultural Research (ICAR) is a major Institute devoted to research on spices. In 1976, it started as a Regional Station of the Central Plantation Crops Research Institute (CPCRI), Kasaragod engaged in research on spices.

A National Research Centre for Spices was established in 1986 with its headquarters at Calicut, Kerala by merging the erstwhile Regional Station of CPCRI at Calicut and Cardamom Research Centre at Appangala, Karnataka. Realising the importance of Spices Research in India this Research Centre was upgraded to Indian Institute of Spices Research on 1st July, 1995

3.4.3.1 Mandate of IISR

The Indian Institute of Spices Research will serve as an Institute of excellence for conducting and coordinating research on all aspects of spices improvement, production, protection and post harvest technology.

To extend services and technologies to conserve spices genetic resources as well as soil, water and air of spices agro-ecosystems.

To develop high yielding and high quality spices varieties and sustainable production and protection systems using traditional and nontraditional techniques and novel biotechnology approaches.

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To develop post harvest technologies of spices with emphasis on product development and product diversification for domestic and export purposes.

To act as a centre for training in research methodology and technology upgradation of spices and to coordinate national research projects.

To monitor the adoption of new and existing technologies to make sure that research is targeted to the needs of farming community.

To serve as a national centre for storage, retrieval and dissemination of technological information on spices

3.4.3.2 Technical Programme

- ✓ Preparation of training schedule
- ✓ Organising training programme.
- ✓ Conduction on demand training programme.
- ✓ Other technology dissemination function.
- ✓ Preparing video film.
- ✓ Agro-clinics
- ✓ Technical bulletin

3.4.4 Central Institute of Medicinal and Aromatic Plants (CIMAP)

Central Institute of Medicinal and Aromatic Plants, popularly known as CIMAP, is a frontier plant research laboratory of Council of Scientific and Industrial Research (CSIR).

Established originally as Central Indian Medicinal Plants Organization (CIMPO) in 1959, CIMAP is steering multidisciplinary high quality research in biological and chemical sciences and extending technologies and services to the farmers and entrepreneurs of medicinal and aromatic plants (MAPs) with its research headquarter at Lucknow and Research Canters at Bangalore,Hyderabad, Pantnagar and Purara.

CIMAP Research Centres are aptly situated in different agro-climatic zones of the country to facilitate multi-location field trials and research. A little

more than 50 years since its inception, today, CIMAP has extended its wings overseas with scientific collaboration agreements with Malaysia.

CSIR-CIMAP has signed two agreements to promote bilateral cooperation between India and Malaysia in research, development and commercialization of MAP related technologies.

CIMAP's contribution to the Indian economy through its MAPs research is well known. Mint varieties released and agro-packages developed and popularised by CIMAP has made India the global leader in mints and related industrial products.

CIMAP has released several varieties of the MAPs, their complete agro-technology and post harvest packages which have revolutionized MAPs cultivation and business scenario of the country.

3.4.5 **Central Plantation Crops Research Institute (CPCRI)**

The Coconut Research Station was established in 1916 at Kasargod, Kerala by the Government of Madras and subsequently it was taken over by the Indian Central Coconut Committee in 1948 and continued till 1970.

Central Plantation Crops Research Institute (CPCRI) was established in 1970 as one of the agricultural research institutes under the Indian Council of Agricultural Research (ICAR), by merging Central Coconut Research Station, Kasargod, Central Coconut Research

The Central Plantation Crops Research Institute (CPCRI) is a renowned research institute under Indian Council of Agricultural Research (ICAR), Ministry of Agriculture, Government of India.

The CPCRI plays a pioneering role in development of technologies for the mandate crops in agriculture in India through its research. It is also engaged in cutting edge areas of science and technology development and its scientists are internationally acknowledged in their fields.

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3.4.5.1 Mandate of CPCRI

1. To develop appropriate production, protection and processing technologies for coconut, arecanut and cocoa through basic and applied research.

2. To act as a national repository for the genetic resources of these crops.

3. To produce parental lines and breeders' stock.

4. To develop improved palm based cropping/farming systems through more effective use of natural resources to increase productivity and income from unit area.

5. To collect, collate and disseminate information on the mandate crops to all concerned.

6. To co-ordinate research on the mandate crops within the country and execute the research programmes under the All India Coordinated Research Project on Palms.

7. To transfer technologies developed at CPCRI to the farmers through the co-operation of developmental departments

3.4.5.2 Transfer of technology

CPCRI organises various technology transfer programmes for disseminating the research results to farmers and extension personnel.

Institutional training programmes on different aspects of production technology of palms and cocoa for the benefit of extension personnel are regularly organized at CPCRI. One day training's along with field visits are arranged to farmers so as to educate them on scientific management of coconut, arecanut and cocoa and to convince them about the technology recommendations.

Need based training programmes relating to production, protection and processing technologies are also being organized for the benefit of farmers.

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Front line demonstrations are arranged in farmers field on different recommended cultivation technologies to convince the farmers about the technical feasibility and economic viability of the technologies.

Effective utilization of mass media like Radio, TV, Newspapers and Farm Magazines is made to create awareness among coconut cultivators about various production technologies. Further, extension pamphlets, CD ROMs, Video Cassettes etc. are also prepared for effective dissemination and popularization of the cultivation technologies in palms and cocoa among the farmers and extension personnel.

Cyber Extension: CPCRI has been implementing various cyber extension activities as part of strengthening the technology transfer programmes of the Institute in mandate crops viz., coconut, arecanut and cocoa.

As part of the cyber extension activities, a group video conferencing system through ISDN was installed at the ATIC, CPCRI, Kasargod to facilitate interaction between various stakeholders for enhancing technology utilization in coconut, arecanut and cocoa.

The video conferencing facility is effectively utilized for scheduling and implementing interface programmes at regular intervals involving various stake holders including researchers, extension personnel, farmers and entrepreneurs.

CPCRI web site (www.cpcri.gov.in) and other services provided by CPCRI for the benefit of farmers also form a part of the cyber extension activities of the Institute. Arrangements have been made for answering queries from farmers, extension personnel and entrepreneurs on different aspects of production, protection and processing of palms and cocoa through e-mail.

CD ROMs as interactive software packages on different technologies of production, protection and processing of palms and cocoa are also being produced and distributed as part of the cyber extension project. Besides the above, an IT enabled kiosk has also been installed at CPCRI Kasaragod

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under the cyber extension project of the Institute to provide information in English,

Hindi and regional languages about various technologies evolved at the Institute in mandate crops and also various services offered to farmers and entrepreneurs.

Exhibitions, Seminars, Kisan Melas and Group Meetings are also regularly organised as part of the technology transfer activities of the institute.

Agricultural Technology Information Centre (ATIC) is established at CPCRI, Kasaragod to provide the required technology information, diagnostic and advisory services and supply of quality planting material to farmers through a single window delivery system. Farmers can write to CPCRI in advance for seedlings and can procure the same in person on intimation.

Krishi Vigyan Kendra's functioning under CPCRI at Kasaragod and Kayamkulam cater to the training needs of farmers of Kasaragod and Alappuzha Districts respectively. Farmers are immensely benefited through the vocational training programmes, front line demonstrations and on farm testing in the farmers' fields and other technology transfer activities organised by the KVKs

3.4.6 The Asian Vegetable Research and Development Center

The Asian Vegetable Research and Development Center headquarters campus in Shanhua, Taiwan was dedicated on October 17, 1973. Now known as the World Vegetable Center, the organization has regional offices in Thailand, India, Tanzania, Mali and Benin.

The Asian Vegetable Research and Development Center was founded on 22 May 1971 by the Asian Development Bank, Japan, Korea, Philippines, Thailand, USA, Vietnam, and the Republic of China (Taiwan) with a mandate to work in tropical Asia. The headquarters campus in Taiwan was dedicated on 17 October 1973. In 2008, the organization adopted a new name — AVRDC – The World Vegetable Center — to reflect its global scope.

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The World Vegetable Center, an international nonprofit research and development institute, is committed to alleviating poverty and malnutrition in the developing world through the increased production and consumption of nutritious and health-promoting vegetables.

The Center mobilizes resources from the public and private sectors to disseminate improved varieties and production methods in developing countries. The centre help farmers increase vegetable harvests, raise incomes in poor rural and urban households, create jobs, and provide healthier, more nutritious diets for families and communities.

Mission: The alleviation of poverty and malnutrition in the developing world through the increased production and consumption of nutritious and health-promoting vegetables.

3.4.7 The International Potato Center (CIP)

The International Potato Center (CIP) was founded in 1971 as a research-for-development organization with a focus on potato, sweet potato and andean roots and tubers. It delivers innovative science-based solutions to enhance access to affordable nutritious food, foster inclusive sustainable business and employment growth, and drive the climate resilience of root and tuber agri-food systems. Headquartered in Lima, Peru, CIP has a research presence in more than 20 countries in Africa, Asia and Latin America.

CIP is a CGIAR research center, a global research partnership for a food-secure future. CGIAR science is dedicated to reducing poverty, enhancing food and nutrition security, and improving natural resources and ecosystem services.

Its research is carried out by 15 CGIAR centers in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sect.

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3.4.8 Mission for Integrated Development of Horticulture (MIDH)

Mission for Integrated Development of Horticulture (MIDH) Mission for Integrated Development of Horticulture (MIDH) is a Centrally Sponsored Scheme for the holistic growth of the horticulture sector covering fruits, vegetables, root & tuber crops, mushrooms, spices, flowers, aromatic plants, coconut, cashew, cocoa and bamboo. Under MIDH, Government of India (GOI) contributes 60%, of total outlay for developmental programmes in all the states except states in North East and Himalayas, 40% share is contributed by State Governments.

In the case of North Eastern States and Himalayan States, GOI contributes 90%. In case of National Horticulture Board (NHB), Coconut Development Board (CDB), Central Institute for Horticulture (CIH), Nagaland and the National Level Agencies (NLA), GOI contributes 100%. MIDH also provides technical advice and administrative support to State Governments/ State Horticulture Missions (SHMs) for the Saffron Mission and other horticulture related activities Rashtriya Krishi Vikas Yojana (RKVY)/NMSA

3.4.8.1 MIDH Schemes :

It has five major schemes on horticulture-

1. National Horticulture Mission (NHM)
2. Horticulture Mission for North East and Himalayan States (HMNEH)
3. National Horticulture Board (NHB)
4. Coconut Development Board (CDB) &
5. Central Institute of Horticulture (CIH), Nagaland

National Horticulture Mission (NHM) is one of the sub schemes of Mission for Integrated Development of Horticulture (MIDH) which is being implemented by State Horticulture Missions (SHM) in selected districts of 18 States and 6 Union Territories.

Horticulture Mission for North East & Himalayan States (HMNEH) is one of the sub schemes of Mission for Integrated Development of Horticulture

(MIDH) which is being implemented by State Horticulture Missions (SHM) in the North Eastern States and Himalayan States.

National Horticulture Board (NHB) is implementing various schemes under Mission for Integrated Development of Horticulture (MIDH) in all States and UTs.

Coconut Development Board (CDB) is implementing various schemes under Mission for Integrated Development of Horticulture (MIDH) in all Coconut growing states in the country.

Central Institute for Horticulture (CIH) was established at Medizipehima, Nagaland in 2006-07 for providing technical back stopping through capacity building and training of farmers and Field functionaries in the North Eastern Region.CIH now one of the sub schemes of MIDH. However, CIH is not implementing any schemes directly.

3.4.8.2 National Horticulture Board (NHB)

National Horticulture Board (NHB) was set up by Government of India in April 1984 on the basis of recommendations of the "Group on Perishable Agricultural Commodities", headed by Dr M. S. Swaminathan, the then Member (Agriculture), Planning Commission, Government of India, as an Autonomous organization under the administrative control of Ministry of Agriculture and Farmers Welfare and registered under Societies Registration Act 1860, thereafter, re-registered under the Haryana Registration and Regulation of Societies Act, 2012, with its headquarters at Gurugarm and 29 field offices located all over the country.

3.4.8.2.1 Aims & Objectives of NHB

The main objectives of the NHB are to improve integrated development of Horticulture industry and to help in coordinating, sustaining the production and processing of fruits and vegetables. Detailed objectives of the Board are as under: -

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1. Development of hi-tech commercial horticulture in identified belts and make such areas vibrant with horticultural activity, which in turn will act as hubs for development of horticulture.
2. Development of modern post-harvest management infrastructure as an integral part of area expansion projects or as common facility for cluster of projects.
3. Development of integrated, energy efficient cold chain infrastructure for fresh horticulture produce.
4. Popularization of identified new technologies / tools / techniques for commercialization / adoption, after carrying out technology and need assessment.
5. Assistance in securing availability of quality planting material by promoting setting up of scion and root stock banks / mother plant nurseries and carrying out accreditation / rating of horticulture nurseries and need based imports of planting material.
6. Promotion and market development of fresh horticulture produce.
7. Promotion of field trials of newly developed/imported planting materials and other farm inputs; production technology; PHM protocols, INM and IPM protocols and promotion of applied R&D programmes for commercialization of proven technology.
8. Promotion of Farm Mechanization in Horticulture through demonstration and its uses at farmers field level to reduce labour cost and increase the productivity of Horticulture crops.
9. Promotion of applied R & D for standardizing PHM protocols, prescribing critical storage conditions for fresh horticulture produce, bench marking of technical standards for cold chain infrastructure etc.
10. Transfer of technology to producers/farmers and service providers such as gardeners, nurserymen, farm level skilled workers, operators in cold storages, work force carrying out post harvest management including processing of fresh horticulture produce and to the master trainers.
11. Promotion of consumption of horticulture produce and products.

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12. Promoting long distance transport solution for bulk movement of horticulture produce through rail etc.
13. Carrying out studies and surveys to identify constraints and develop short and long term strategies for systematic development of horticulture and providing technical services including advisory and consultancy services.

3.4.8.2.2 Schemes of NHB

1. Development of commercial Horticulture through Production and Post-Harvest Management

2. Capital Investment Subsidy for Construction / Modernization Expansion of Cold Storage and Storage's for Horticulture Produce

3. Technology Development and Transfer for Promotion of Horticulture

4. Market Information Services for Horticulture Crops

5. Horticulture Promotion Services (including terms of reference for Techno-economic Feasibility Study)

3.4.8.3 NATIONAL HORTICULTURE MISSION (NHM)

National Horticulture Mission is a centrally sponsored scheme in which Government of India provide 100% assistance to the state mission during the year 2005-06 (Tenth Plan) During XI plan, the assistance from Government of India will be 85% with 15% contribution by the State Government.

Objectives of the NHM

To develop horticulture to the maximum potential available in the State and to augment production of all horticultural products (Fruits, Vegetables, Flowers, Plantation crops, Spices, Medicinal Aromatic plants) in the state.

To provide holistic growth of the horticulture sector through an area based regionally differentiated strategies

To enhance horticulture production, improve nutritional security and income support to farm households;

To establish convergence and synergy among multiple on-going and planned programmes for horticulture development;

To promote, develop and disseminate technologies, through a seamless blend of traditional wisdom and modern scientific knowledge;

To create opportunities for employment generation for skilled and unskilled persons, especially unemployed youth;

3.4.8.4 **National Horticultural Research and Development Foundation (NHRDF)**

The National Horticultural Research and Development Foundation (NHRDF) was established by National Agricultural Co-operative Marketing Federation of India Ltd. (NAFED) and its Associate Shippers of onion on 3 November, 1977 under Societies Registration Act, 1860 at New Delhi.

During 1989, the Head Office of NHRDF was shifted to Nasik but the Registered Office is at New Delhi . The aim of establishment of NHRDF was to guide the farmers, exporters and others concerned for improving the productivity and quality of horticultural crops in order to make available sufficient quantity for domestic requirement and also to boost up export of onion and other such export oriented horticultural crops in the country.

Onion was the first crop on which the NHRDF has started its Research and Development programmes to meet the above mentioned aim and subsequently garlic, okra, chilli, French bean crops etc. have been added.

The NHRDF initially started as a small center at New Delhi in 1978 and now it has 5 Regional Research Stations, Laboratories on different aspects and 20 Extension Centers spread all over the major onion and garlic growing pockets of the country. It has also established one Krishi Vigyan Kendra at Ujwa in New Delhi to cater the needs of farmers of Delhi State.

The Head Quarter of NHRDF is located 20 km away from Nasik towards North-East on the Nasik-Aurangabad Road at 20 o North Latitude and 73 o 57' East Longitude at 492 m above mean sea-level at Chitegaon Phata in Niphad Taluka of Nasik district.

3.4.8.3.1. Mission of the NHRDF

The mission of NHRDF is to provide technological empowerment to farmers through well-trained manpower and well-organized R&D activities, and efficient extension networking for enhancing production and productivity and minimizing post-harvest losses through scientifically developed technologies. The NHRDF would make the programs meet 25% of the demand of onion and garlic by tapping the potential of unused land and 75% by technological development.

3.5 Selected programs of leading national and international forest institutes

The forestry-related institutions play an important role in the efficient management of forest and wildlife resources through capacity building of the forestry extension personnel and finding solutions to the concerned problems through research and development.

3.5.1 Indian Council of Forestry Research and Education, Dehradun-

In the reorganization of forestry research, education, and training in India, the ICFRE was established in December 1987 as an apex forestry research and education organization in the country. The ICFRE was subsequently granted autonomy in June 1991.

The objectives of the Council are to undertake, aid, promote and coordinate forestry education, research, and its applications, develop and maintain a national library and information center for forestry research and allied sciences, and act as a clearing-house for research and general information, develop forestry extension programs and propagate the same, and to provide consultancy services in the fields of forestry research, education, training, and allied sciences.

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It has eight research institutes and four advanced research centers which undertake thematic research and cater to the research needs on a regional basis.

The institutes are: Forest Research Institute (FRI), Dehradun; Himalayan Forest Research Institute (HFRI), Shimla; Arid Forest Research Institute (AFRI), Jodhpur; Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore; Institute of Wood Science and Technology (IWST), Bangalore; Rain Forest Research Institute (RFRI), Jorhat; Institute of Forest Productivity (IFP), Ranchi; and Tropical Forest Research Institute (TFRI), Jabalpur. The advanced research centres are located at Allahabad, Chhindwara and Hyderabad. A new Advanced Institute Research Centre for Bamboos and Rattans is being set up at Aizawl, Mizoram under the (RFRI), Jorhat.

3.5.2. Indian Institute of Forest Management, Bhopal-

The Indian Institute of Forest Management was established as an autonomous institution in 1982 under the MoEF. The objectives of the institute are to provide training in management and related subjects to persons and personnel of forest related industries with a view to equipping them to practice the art and profession of management, in a most effective and efficient manner, prepare outstanding talented persons for careers leading to management responsibilities in forestry and forest-related systems.

It provide up-to-date information on forest management and carry out research in matters concerning the use of management, and allied techniques and methods conducive to the development of forestry.

3.5.3. Forest Research Institute, Dehradun

Established in 1906, the Forest Research Institute, Dehra Dun, is one of the oldest institutions of its kind and is acclaimed the world over.

The Institute's history is synonymous with the evolution and development of scientific forestry, not only in India but over the entire Indian sub-

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continent. Extension is an important post-research activity. Research without extension to the end-users is meaningless and not justified.

The Extension Division of the Forest Research Institute (FRI) serves as an interface between the institute and end-users/stakeholders to strengthen the outcome of research carried out by FRI Scientists and other researchers on the different aspects of forestry. A brief account of important extension activities are given below:

Extension Division, FRI had organized/coordinated more than 70 training programs for farmers, nursery growers, researchers, students, and various stakeholders from 2008 to till date on various aspects of forestry. More than 2500persons have been trained in various aspects of forestry. On average four exhibitions per year had also been organized at various places to create awareness and showcase our achievements to the public.

Forest Research Institute, Dehradun had established six Van Vigyan Kendras (VVKs) and two Demo villages to assist/help and access the user groups to the technical know-how of appropriate technologies in States and UTs of its jurisdiction

3.5.4 World agroforestry center

The Center for International Forestry Research (CIFOR) is a non-profit scientific research organization that conducts research on the use and management of forests with a focus on tropical forests in developing countries.

CIFOR is the forestry research center of the Consultative Group on International Agricultural Research (CGIAR), a network of 15 research centers around the world that focus on agricultural research for sustainable development, working closely with governments and other partners to help develop evidence-based solutions to problems related to sustainable agriculture and natural resource management.

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CIFOR's research contributes to the three CGIAR System-Level Outcomes: reduced poverty, improved food and nutrition security, and improved natural resource systems and ecosystem services.

It also contributes to the new United Nations Sustainable Development Goals and commitments made by countries in the Paris agreement and other accords related to the UN Framework Convention on Climate Change.

CIFOR has its headquarters in Bogor, Indonesia. It has three regional offices: in Burkina Faso (West Africa), Cameroon (Central Africa) and Kenya (East and South Africa).

CIFOR is one of 15 centers within the Consultative Group on International Agricultural Research (CGIAR).

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NHB https://agritech.tnau.ac.in/horticulture/horti_schemes_nhb.html

CIFOR centre for international forest researchhttps://www.cifor.org/

International potato centrehttps://cipotato.org/

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Course Name	Fundamentals of Extension Education
Lesson 4	Rural Development: Meaning, Objectives, Scope and Genesis.
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
University Name	Kerala Agricultural University, Thrissur

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4.1 Objectives of the Lesson: -

- To get acquainted with the meaning and definition of rural development
- To know about various objectives of rural development
- To explore the various problems of rural development
- To learn about genesis of pre independence and post-independence programmes
- To explain the Functions of Extension education in Rural Development

4.2 Glossary

Rural refers emphatically to population living in the area of low density and to small settlements.

Development refers to the overall movement towards greater efficiency and complex situations.

Rural development is a strategy designed to improve the economic and social life of rural poor.

Self-help is most basic philosophy in extension work for helping own self.

Genesis of rural development means the origin or mode of formation of something.

Brati balika are the people organized as village scouts for rural reconstruction work at shantinikatan

Firkas are the Revenue blocks, revenue circles, firka, or patwar circles in the district

Mazdoor Manzil is the otherwise known as nilokheri experiment

Urban area is an urban area, or built-up area, is a human settlement with a high population density and infrastructure of built environment.

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4.3 Meaning of Rural Development

Rural development is process of enhancement of living standards of rural people with effective utilization of available local resource. The term rural development combines two words Rural and Development.

A society or community can be classified as rural based on the criteria of lower population density; agriculture would be the major occupation of rural area less social differentiation, less social and spatial mobility, slow rate of social change, etc

The National Sample Survey Organisation (NSSO) defines 'rural' as follows: An area with a population density of up to 400 per square kilometer, Villages with clear surveyed boundaries but no municipal board, A minimum of 75% of male working population involved in agriculture and allied activities.

According to FAO, the rural area definition is subjective but three common dimensions of "rurality" are sparse settlement, land cover and use, and remoteness from urban areas.

Development: It refers to growth, evolution, stage of inducement or progress. This progress or growth is gradual and had sequential phases. Always there is increasing differentiation. It also refers to the overall movement towards greater efficiency and complex situations.

Rural development designates the utilization of approaches and techniques under one single programme, which rally upon local communities as units of action. It provides a large umbrella under which all the people engaged in the work of community organizations, community progress and community relation.

The term rural development connotes overall development of rural areas with a view to improve the quality of life of rural people. In this sense, it is a comprehensive and multidimensional concept and encompasses the development of agriculture and allied activities village and cottage

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industries and crafts, socio-economic infrastructure, community services and facilities, and above all, the human resources in rural areas.

4.3.1 Concept of rural development

The term Rural and Development- is used in different ways:-

As a **Concept** – Development of Rural areas

As a **phenomenon**- Interaction between institutional factors

As a **Strategy**- Approach to bring positive change in rural life

As a **phenomenon**, rural development is the end result of interactions between various physical, technological, economic, socio-cultural and institutional factors.

As a **strategy**, it is designed to improve the economic and social well being of a specific group of people – the rural poor.

As a discipline, it is multidisciplinary in nature representing an intersection of agricultural, social, behavioral, engineering and management sciences.

Rural development is a strategy to enable a specific group of people, poor rural –women and men, to gain for themselves and their children more of what they want and need. It involves helping the poorest among those who seek a livelihood in the rural areas to demand and control more of the benefits of rural development. The group includes small scale farmers, tenants and the landless. (Robert Chambers, 1983)

Rural development is necessary not only because an overwhelming majority of population lives in villages, but because the development of rural activities is essential to accelerate the pace of overall economic development of the country.

Ultimate Objective of rural development is improving the quality of life of rural poor

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4.4 Definition of Rural Development

1. Rural development is a process of transformation from traditionally oriented rural culture towards an acceptance and reliance on science and technology (Ensminger).

2. Rural development improves the living standard of masses of low income population residing in rural areas and making the process of rural development self sustaining" (Lele).

3. "To improve the economic and social life of specific group of people, the rural poor" (Agarwal).

4. Rural development defines as the process of change among hundreds of thousands of rural people. These people are found in families living in small isolated villages or moving about in small nomadic kinship clusters (Axinn (1977)).

5. Rural development is a process through which rural poverty is alleviated by sustained increases in productivity and income of low income rural workers and households (World Bank).

6. According to Finance Ministry, rural development is systematic and integrated use of national resources enabling every person to engage himself in production and social useful occupation and earn income that will meet at least the basic needs.

7. According to National Commission on Agriculture, rural development means development of an area and the people through optimum development and utilization of local resources by bringing about necessary institutions, structures and attitudinal changes and by delivering package of services to improve all fields of the rural poor and rural weak.

8. rural development is a planned process using any form of action or communication designed to charge the environment, techniques, institutions and attitudes of the rural people in such a way that to eliminate their poverty and improve their way of life (Aziz (1964)).

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9. Rural development has been defined as a process which leads to a continuous rise in the capacity of the rural people to control their environment, accompanied by a wider distribution of benefits resulting from such a control.

10. Rural development in general is used to denote the actions and initiatives taken to improve the standard of living in non – urban neighborhoods, countryside and remote villages.

4.5 Scope and Importance of rural development

Rural development is a dynamic process, which is mainly concerned with the rural areas. These include agricultural growth, putting up of economic and social infrastructure, fair wages as also housing and house sites for the landless, village planning, public health, education and functional literacy, communication etc.

Rural development is a national necessity and has considerable importance in India because of the following reasons.

- Today, rural development still remains the core of the overall development of the country.
- It has become more than two-thirds of the country's people is dependent on agriculture for their livelihood and one-third of rural India is still below the poverty line. Therefore, it is important for the government to be productive and provide enough facility to upgrade their standard of living.
- About three-fourth of India's population live in rural areas, thus rural development is needed to develop nation as whole.
- Nearly half of the country's national income is derived from agriculture, which is major occupation of rural India.
- Bulks of raw materials for industries come from agriculture and rural sector viz; sugar, salt, cotton, fruits, vegetables, acute ingredients for medicines etc.

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- Increase in industrial population can be justified only in rural population motivation and increasing the purchasing power to buy industrial goods.
- Growing disparity between the urban elite and the rural poor can lead to political instability.
- A stable agricultural economy is necessary for maintaining stability in the prices of industrial goods.

4.6 objectives of rural development

The objectives of rural development is multi-dimensional and multi directional

1. To improve the living standard by providing food, shelter, clothing, employment and education with basic infrastructure facilities in the rural areas
2. To improve agricultural productivity and reduce poverty
3. To provide basic social services like health and education for socio-economic development
4. To involve people in planning and development through participation in decision making and through decentralisation
5. To ensure distributive justice and equalisation of opportunities of rural people
6. Aims of higher perfecting and Aims of building up of sound value system.

The objectives of rural development, according to the World Bank, are not restricted to any single department but spread over several, and the resultant mix serves to raise agricultural output, create new employment, improve health and education, expand communications, provide housing etc.

According to Singh (1999), the main objectives of rural development in all societies, irrespective of their economic, political and socio-cultural systems are:

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1. To increase the availability and improve the distribution of the life-sustaining goods, such as food, clothes, shelter, health and security;
2. To raise per capita purchasing power and improve its distribution by providing better education, productive and remunerative jobs and cultural amenities
3. To expand the range of economic and social choices to individuals by freeing them from servitude and dependence.

Therefore, a measure of rural development should provide, at the minimum, an indication of per capita availability of life-sustaining goods or per capita income in rural areas, as well as some idea of the distribution of income, assets and other means of socio-economic welfare.

4.6 Functions of Extension education in Rural Development

Extension Education is the process of developing capabilities of the individuals through education which is stretched out to people to meet their needs.

Rural development aims at enhancement in the standard of living of the poor through various programmes designed and planned to meet the developmental needs.

It can be concluded that Rural Development is the programme and Extension Education is the process of taking the programme to the right people in a right way to meet their developmental needs, thus enhances the standard of living.

The nine functions of Extension Education process in rural development programme.

Planning – It identifies the needs of the people and sketch out a programme to meet the identified needs.

Convergence – It identifies the suitable rural development programme in operation, which is relevant to meet the needs and decides the extent, situation and action of utilization.

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Coordination – It brings the people with needs, the institutions with programmes and personnel with functions on one plat form to meet the common goal.

Cooperation – It motivates planners, executers and users to work as a team with a combined force to meet the goals.

Collaboration – It pools all the essential resources from all directions to make them accessible to achieve the goal.

Facilitation – It plays a role of catalyst in the implementation of development programme and smoothens the progress

Monitoring - It keeps an eye on the progress of the programme for the purpose of overcoming the obstacles

Evaluation – It quantitatively assess the quality and quantity of progress at periodic intervals to reconsider any of the issues that are not met.

Network- The process of extension education finally set the functional relationships between institutions, which works as input and output device in the field of human development.

4.7 Problems in rural development

4.7.1 People related:

1. Traditional way of thinking, Poor understanding,

2. Low level of education, Personal ego.

3. Low level of education to understand developmental efforts and new technology.

4. Deprived scientific orientation,

5. Lack of confidence,

6. Poor awareness, Existence of unfelt needs.

4.7.2 Agricultural related problems:

1. Lack of expected awareness, knowledge, skill and attitude.

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2. Unavailability of inputs, Poor marketing facility,

3. Insufficient extension staff and services.

4. Small size of land holding Division of land.

5. Unwillingness to work and stay in rural areas,

6. Multidimensional tasks to extension personnel

4.7.3 Infrastructure related problems:

Poor infrastructure facilities like water, electricity, transport, educational institutions, communication, health, storage facility etc.

4.7.4 Economic problems:

1. Unfavorable economic condition to adopt high cost technology.

2. High cost of inputs.

3. Underprivileged rural industries

4.7.5 Social and Cultural problems:

1. Cultural norms and traditions and Conflict within and between groups, castes, religions, regions, languages.

4.7.6 Leadership related problems:

1. Leadership among the hands of inactive and incompetent people.

2. Malafied interest of leaders, Biased political will etc

4.7.7 Administrative problems:

1. Earlier, majority of the programmes were planning based on top to bottom approach and were target oriented.

2. Political interference, Lack of motivation and interest,

3. Unwillingness to work in rural area, improper utilization of budget.

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Issues related to rural development

There are different problems or major issues which might be categorised as the following:

- Growth vs. distribution
- Agricultural development vs. industrial development
- Centralisation vs. decentralisation
- Urban development vs. rural development
- Land reforms
- Development of productive human resources
- Modernisation
- Migration

4.8 The genesis of rural development

In a predominantly agriculture based economy like India where nearly 75 percent of the population lives in rural areas and rarely 20 percent of national income is generated in the agricultural sector, rural development ought to get top priority. *Mahatma Gandhi* had said "I would say that if the village perishes, India will perish too".

Rural development in India initiated before independence by various social workers individually in scattered area. Rural development programmes since 1901 to 2020 may be classified in three phases viz: phase I (1903-1950), phase II (1951-2000) and phase III (2001-2020).

Rural development programmes before 1950 were mainly based on individual initiative during 1960 intensive approach was adopted. Integrated approach was basic idea during 1980 while after 2000 government of India adopted mission mode approach with sustainable development is key component.

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Table 4.1:- Rural development programmes before 1950

Programmes	Year of beginning	Person associated	Distinct features
Scheme of Rural Reconstruction at the Sunderbans in Bengal	1903	Sir Daniel Hamilton	Model villages in sunderban based on cooperative principles
Sriniketan experiment in Bengal	1920-21	Sri Rabindra Nath Tagore	Youth organizations in the villages
Gurgaon project in Haryana	1920	Mr. F.L. Brayne	Rural uplift movement on a mass scale was first started
Seva-gram experiment in Wardha in Gujarat	1921	Shree Mahatma Gandhi	Totally based on the concept of "Helping the people to help themselves".
Marthandam project in Kerala	1928	Dr. Spencer Hatch	Fivefold programme-development of the physic, spirit, mind, economic and social aspects of life.
Baroda village reconstruction project	1932	Shree B.T. Krishnamachari	at developing "will to live better" and a capacity for the self-help and selfreliance.

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Indian village service in lucknow	1945	Mr A T Mosher & Shri B N Gupta	Assit government in developing villages
Sarvodaya in Bombay state	1946	Shree Vinobha Bhave	Based on Gandhian principle Reconstruction of human values
Firka Vikas Yojana in Madras	1946	Government of Madras	Gandhian ideal of "Gram Swaraj". All-round development of rural people
Grow More Food Campaign	1947-48	Government of Madras	to intensify food production in the Madras Province.
Nilokheri experiment (Mazdoor Manzil)	1948	Shree S. K. Dey	Self sufficient and making a rural cum urban township.
Etawah pilot project	1948	Albert Mayer	To build up a sense of community living. Confidence building

4.9 Rural development programme before 1950

4.9.1 Shantiniketan attempts

Origin: Rabindranath Tagore in collaboration with Leonard. K. Elmhirst. in 1921 at sriniketan in Bengal .A group of eight villages was the center of the programme.

Objectives: Studying and analysing rural problems, using them in action and helping villages to develop their resources.

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Activities:

- Popularising health co-operatives, better seed and manures, cottage industries
- organizing village meals.
- Creating a spirit of self help and developing village leadership.
- Organizing village scouts called “Brati Balika”.
- Training and organizing the weavers.
- Training in tanning, pottery, embroidery, tailoring etc.
-

Short Comings:

- Too much emphasis on ‘Center’.
- Confined to limited villages.
- Tagore’s interest in ‘idea’ catching on.

4.9.2 Gurgaon Attempts

Origin: F.L. Brayne in Gurgaon district of Punjab state in 1920. Rural uplift movement on a mass scale was first started by Mr. F.I. Brayne, Dy. Commissioner in the Gurgaon district of Punjab in 1920.

The work gathered momentum after 1933 when Mr. Brayne was appointed as Commissioner of Rural Reconstruction in the Punjab. In 1935-36, the Government of India granted Rs. One crore for the work which acted as a stimulus.

After that the work was transferred to the Cooperative Department and Better Living Societies were organized to take up this work in the villages.

Objectives:

- Increasing farm yields,
- Stopping overspending in social functions.
- Improving health standards and
- Home improvement and women welfare.

Activities: Irrigation, a forestation, composting, cattle improvement, women’s education and discouragement of heavy spending on social function etc.

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Short comings: Use of authority, untrained field workers discontinuity of work and limited planning.

4.9.3 Marthandam Projects

Origin: Started by Spencer Hatch in then Travancore state in 1921. He is an American Agricultural Expert in Travancore State under the auspices of Y.M.C.A. in 1921.

Objectives: Rural reconstruction to bring about complete upward development towards more abundant life for rural people spiritually mentally, physically, socially and economically through self-help and expert counsel.

Methods: Counseling farmers on economy and self-help, demonstrations, working through trained leaders, developing village organizations and rural surveys.

Activities: Agriculture, cottage industries, Community programmes, Bee-Keeping, poultry farming etc.

Good points: Training of staff, comprehensive planning, starting with existing conditions and low financial load.

Weak points: Lack of government backing and lack of continuity of contacts with villages, religious standing of the institution.

4.9.4 Sevagram Project

Origin: Mr. M. K. Gandhi (Mahatma Gandhi) started this programme in 1921 at Sewagram. Later it was extended to Wardha in 1933.

Objectives: Upliftment of under privileged people and village regeneration.

M. Gandhi also insisted that all extension workers should have 3 principles in practice viz., self purification, self reliance and self exemplary conduct.

Principles

1. Self help
2. Dignity of labour e.g. Sharamdan, etc.
3. Self respect
4. Truth and non-violence

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Activities: Organizing training centre for cottage industries, communal harmony, and prohibition/removal of untouchability.

Established All India Village Industry Association, All India Spinners Association, Hindustani Education Association and Kasturba Gandhi Association etc

Limitations: High personal and moral standards which were difficult to achieve by common people.

Gandhaji's constructive programme was not fully successful because hand made products was dominated by machine made products which attracted common man more. The single cause of failure of Gandhiji's programme was Industrialization in the country.

4.9.5 Etawah Project

Origin: Started by Albert Mayor in 1948 in Mahewa Village about 11 miles away from Etawah in United Province.

- Initially 64 villages were selected which then increased to 97.
- The Government of UP and Point-4 programme of U.S.A. provided help for this project.
- It can be treated as a forerunner for Community Development Programme.

Objectives:

- To improve farm production and social development
- To see how quickly the results can be achieved in an average situation.
- To see how these results could be helpful in the areas
- To find out methods of gaining and growing confidence of the villagers.
- To build up a sense of community living.

Activities: Included were increasing farm yields, soil conservation animal husbandry, and village sanitation. The village level workers were trained and appointed.

Short comings: Each of the past attempts had some good points and some limitations. However, the cumulative experience of these attempts

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has been very helpful in designing community development programme in India.

4.9.6 Nilokheri Project

Origin: It was started by S. K. Dey at Punjab in 1947-48. It was originally started in 1948 to rehabilitate 7000 displaced persons from Pakistan. Later it was integrated with 100 surrounding villages making a rural cum urban township. The scheme was called as "Mazdoor Manzil".

Objectives:

- To develop a new township to rehabilitate displaced persons from West Pakistan.
- Self-sufficiency for the township in all the essential requirements of life.

Activities: - The new township was built in a barren land by refugee's self-help and government's assistance under the leadership of S. K. Dey. The township had school, farm, training centre, dairy poultry, piggery, press, and garment factory, soap factory etc.

4.9.7 Firka Development Project

Origin :-The scheme was launched in the last quarter of 1946 in 34 Firkas throughout the State and on April 1, 1950, it was extended to another 50 additional Firkas, at the rate of two Firkas for each distinct.

The section of the Firkas was based on considerations of the general backwardness of the area and the possibilities for initiating the production of handloom cloth and other cottage industries which facilitate Rural Reconstruction. Among Pre-Independence projects, this was the biggest project.

Objectives:-Gandhian ideals of simplicity, non-violence and sanctity of labour did not only evoked response in the Northern parts of the country, but also in the south, where in a Govt. sponsored scheme it aimed at the attainment of the Gandhian ideal of Gram Swaraj by bringing about not only educational, economic, sanitary and other improvements in villages, but also by making the people self-confident.

- Preparation of short term plans for the development of rural communication, water supply.

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- Long term plan to make the area self sufficient through agricultural, irrigational and livestock improvements.
- Formation of panchayats and organization of cooperatives.
- Introduction and development of Khadi and Cottage Industries.
- All-round development of rural people

4.9.8 Limitations of Pre Independence programme

Some of the important short-comings of the past attempts may be summarised as follows:

- The attempts were mostly initiated by individuals inspired by humanitarian considerations.
- The attempts were mostly isolated, uneven and discontinuous.
- Government backing and financial support were not forth coming in sufficient measure.
- Staff employed was inadequate, inexperienced and untrained.
- The objectives were not very clear and the programmes suffered in implementation.
- Proper planning, programming and implementation were lacking and sometimes unbalanced.
- Parallel programs of supplies, services, guidance and super vision were not developed.
- Evaluation and research were lacking, proper methods and skills were neither employed nor recognised the lead of them.
- Involvement of local people in thinking, planning and executing village development was wanting.
- Co-ordination of other development departments was very limited.

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Course Name	Fundamentals of Extension Education
Lesson 5	Developmental Programmes from 1950-2020
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
University Name	Kerala Agricultural University, Thrissur

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5.1 Objectives of the Lesson

To understand the various types of development programmes mainly focus on rural people

To study the distinct featues of selected rural development programmes

To explain the objectives of selected rural development programmes

To know about activities undertaken on developmental programme

5.2 Glossary

Rural development is a strategy to enable a specific group of people, poor rural women and men, to gain for themselves and their children more of what they want and need

Community development is a movement designed to promote better living for the whole community with the active participation and on the initiative of the community

Objective is a statement of change in knowledge, feeling or action we want to bring about in people

“rural employment” covers any activity, occupation, work, business or service performed in rural areas for remuneration, profit, social or family gain, in cash or in kind

Beneficiary refers to a person or thing that receives help or an advantage from something here rural development programme

Development programmes refers to strategies, approach , policy or schemes for development of people.

5.3 Development programmes

The approach, objectives and strategies of Development programmes in our country have been modified since independence. The development programs before fourth five plans was intensive and area specific in nature. Integrated rural development programmes launched in 1980 all over India was biggest anti poverty programme with beneficiaries are the poor family of the village.

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In the beginning of 21st century the rural development programmes adopted the approach of mission mode which is more inclusive in nature.

The developmental programmes and their distinct features from 1950-2000 has been presented in table 5.1 where s the developmental programmes from 2001 to 2020 has been given in table5.2 with the key objectives of the programmes.

Table 5.1 Rural development programmes from 1951-2000

Programmes	Year of beginning	Distinct features
Community Development Programme (CDP)	1952	Communities of people can develop capacity to deal-with their own problems
Key village scheme	1952	first organized attempt to develop village cattle and buffaloes
National Extension Service (NES)	1953	Proceed development work on the basis of self-help
Panchayati Raj Institutins	1959	Three tier structure of self-governing bodies
Intensive Agriculture District Programme (IADP)	1960	To provide loans, seeds, fertilizers and tools to the farmers.
Intensive Agriculture Area Programme (IAAP)	1964-65	To develop the special harvests
High Yielding Variety Programme (HYVP)	1966-67	To increase productivity of food grains by adopting latest varieties of inputs for crops.
Green Revolution	1966-67	To increase food grains especially wheat production

Rural Works Programme	1970	To provide employment to the weaker sections, backward and drought prone areas.
Drought Prone Area Programme (DPAP)	1973	To try an expedient for protection from drought by achieving environmental balance and by developing the groundwater.
Marginal Farmers and Agriculture Labour Agency (MFALA)	1973-74	For technical and financial assistance to marginal and small farmers and agriculture labour.
Small Farmers Development Agency (SFDA)	1974-75	For technical and financial assistance to small farmers.
Command Area Development Programme (CADP)	1974-75	To ensure better and rapid utilization of irrigation capacities of medium and large projects.
T & V programme	1974	to build a professional extension service that will be capable of assisting farmers
Twenty Point Programme	1975	Poverty eradication and raising the standard of living.
National Institute of Rural Development	1977	Training, investigation and advisory

		organization for rural development.
Desert Development Programme (DDP)	1977-78	For controlling the desert expansion and maintaining environmental balance.
Food for Work Programme	1977-78	Providing food grains to labour for the work of development.
Antyodaya Yojana	1977-78	To make the poorest families of the village economically independent.
Training Rural Youth for Self-Employment (TRYSEM)	1979	Programme of training rural youth for self-employment.
Integrated Rural Development Programme (IRDP)	1979-80	All round development of the rural poor through a Programme of assert endowment for self-employment.
National Rural Employment Programme (NREP)	1980	To provide profitable employment opportunities to the rural poor.
Development of Women and Children in Rural Areas (DWCRA)	1982	To provide suitable opportunities of self-employment to the women belonging to the rural families who are living below the poverty line.

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Rural Landless Employment Guarantee Programme (RLEGP)	1983	For providing employment to landless farmers and labours.
National Fund for Rural Development (NFRD)	1984	To grant 100% tax rebate to donors and also to provide financial assistance for rural development projects.
Indira Awas Yojana (IAY)	1985	To construct houses for the poorest people of SC/ST communities and the free bounded labour.
Jawahar Rozgar Yojana (JRY)	1989	For providing employment to rural unemployed.
Mahila Samridhi Yojna	1993	Encourage rural women to deposit in Post office schemes
Jawahar Gram Samridhi Yojana (JGSY)	1999	Creation of demand driven community village infrastructure.
Swama Jayanti Gram SwarozgarYojana (SGSY)	1999	For eliminating rural poverty and unemployment and promoting self-employment.
Antyodaya Anna Yojana	2000	To provide food security to poor.
Pradhan Mantri Gram Sadak Yojana (PMGSY)	2000	To line all villages with pucca roads.

5.4 Selected development Programmes from 1950-2000

5.4.1 Community Development Programme

5.4.1.1 Definition of community and community development

A community consists of persons in social interaction within a geographical area and having one or more additional communities.

Community development is a movement designed to promote better living for the whole community with the active participation and on the initiative of the community.

Community Development is a balance programme for stimulating the local potential for growth in every direction. Its promise of reciprocal advance in both wealth and welfare, not on the basis of outside charity but by building on the latent vitality of the beneficiaries themselves with the minimum of outside aid.

Community Development is technically-aided and locally organized self-help.

The term "Community Development" has come into international usage to denote the process by which th be efforts of the people themselves are united with those of governmental authorities to improve the economic, social and cultural condition of the communities to integrate these communities in the life of the nation and to enable them to contribute fully to national progress.

Community development is the term used to describe the technique many governments has adopted to reach their village people and to make more effective of local initiative and energy community organize themselves for planning; make group and individual plants to meet their needs and solve their problems; execute these plants with a maximum of reliance upon community resources; and supplement these resources when necessary, with services & materials from governmental & non-governmental agencies outside the community.

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Both the method & process: community development is considered to be method as well as process. It is the method of helping local communities to become more aware of there needs to assess their resources more realistically, to organize themselves & resources in such a way as to satisfy some of their needs through occasional projects so that villagers are unable to their own efforts to move steadily towards the goal of self-improvement.

5.4.1.2 Meaning and origin of co community development Programme

The CDP was launched in India on 2"d October, 1952 with 55 community development project (CDPS). Each project had on operational area to 500 square miles, comprising 300 villages and a population of about 2lakhs. The project area was divided into 3 development blocks, each consisting of about 100 villages and a population of 60-70 thousand. The project was headed by a Project Officer, and a number of subject maser Extension Officers in the disciplines of agriculture, animal husbandry, cooperation, industries, rural engineering, social education etc.

Each project had about 60 multi-purpose village level workers (VLWs), one for each group of 5 to 10 villages. They were government appointed extension functionary at the lowest level, who were nearest to the departments engaged in rural development work. The people in all the project area responded enthusiastically and the need for a rapid expansion of the programme to other parts of the country was urgently felt. Limited resources, however, did not permit a rapid expansion of the CD projects.

A year later, in 1953 the national extension service (NES) programme was launched with the idea of having wider coverage at less cost and more people's participation. Each NES block was headed by a block development officer (BDO) and had a number of extensions of officers (Eos). For the NES block funds were drastically reduced and the number of multipurpose VLWs was brought to 10.

It was a major development in the share in rural reconstruction in India. Since the basic idea underlying both CD and NES programs was the same, the two were integrated under one agency at the centre as well as in the state. Both

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the programmes were complementary and interwoven and concurrently. NES was viewed as the permanent setup for extension in the content & it was intended to cover the entire country with an organization for agriculture & rural development within a period of about 10 years.

The momentum gained by the NES programme was intensified by converting some selected NES block to CDP. The programme was initiated in 1954. The NES blocks which produced good results and where peoples participation had been in abundance, were selected for the purpose.

5.4.1.3 Philosophy of Community development programme

Communities of people can develop capacity to deal-with their own problems

People want change can change.

People should participate in making, adjusting or controlling the major changes taking place in their communities.

Changes in community living that are self— imposed or self— developed have a meaning and permanence that imposed changes do not have

A ‘holistic approach' can deal successfully with problems, with which a fragmented approach' cannot cope.

Democracy requires the people's co- operative participation action in the affairs of the community; the people must learn the skill- which makes this possible.

Frequently communities of people need help in organizing to deal-with their needs, just as many individuals require help in coping with their individual problems.

5.4.1.4 Principle of Community development programme

The 'United Nations economy & social- council- as been trying to define such principles concepts of community development as will be acceptable to all its members — states & which they should agree to implement as far as possible.

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The objective is that plans for international- aid to programmes of community development should be formulated in terms of these principles & concepts. In one of the councils reports the basic elements of guiding principles of community policies & programmes were summarized as follows:

1. Activities under taken must correspond to the basic needs of the community; the first project should be initiated in response to the expressed needs of the people.

2. Local improvements may be achieved through unrelated efforts in each substantive; field however, full and balanced community development require concerted action the establishment of multipurpose programmes.

3. Changed attitudes in people are as important as the material achievement of community project during the initial- stages of development.

4. Community development aims at increased & better participation of the people in community affairs, revitalization of existing forms of focal govt. transition towards effective focal- administration where it is not yet functioning.

5. The identification, encouragement training of focal-leadership should be a basic objective in any programme.

6. Greater reliance on the participation of women e youth in community project invigorates development programmes, establishes them on a wide basis & secure long range expansion.

7. To be fully effective, self-help projects for communities require both intensive and extensive assistance by the government.

8. Implementation of community development programme on a national-scale requires adoption of consistent policies, specific administrative arrangement Recruitment and training of personnel, mobilization of focal and national resources and organization of research, experimentation and evaluation.

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9. 'The resources of voluntary non-governmental organizations should be fully utilized in community development programmes at the focal; national and international level Economic and social progress at the focal &vet necessitates parallel development on a wider national scale.

5.4.1.5 Objectives of Community development programme

The fundamental or basic objective of community development in India is the development of people or “Destination Man”. Its broad objectives are:

I. Economic development.

II. Social-justice and

III. Democratic growth.

The attempt is to secure as good a balance as possible among these three objectives and to inter-relate them in a manner that they support one another.

More specifically, objectives of the community development programmes are:

To assist each village in having effective panchayats, cooperatives & schools;

Through these village institutions, Plan and carry out integrated multi-phased family, village, block and district plans for.

A) increasing agricultural-production.

B) improving existing village crafts & industries & organizing new ones.

C) providing minimum essential- hearth services & improving health practices.

D) providing required educational facilities for children and an adult education programme

E) providing recreational facilities & programmes.

F) improving housing and family living conditions, and

G) providing programmes for village women & youth.

As seen, at every level along with the official setup, non-officials participation has also been emphasised. This programme is often called as a "peoples'

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programme". There is great stress on the peoples' participation not merely in the execution of the programme but also in its planning.

5.4.2 Intensive Agricultural Development Programme (IADP)

Popularly known as "PACKAGE PROGRAMME" was launched in the country from Kharif 1960. The central idea behind the IADP was that increased agricultural productivity shall lead to economic growth, which shall bring welfare to the society. The method adopted in IADP was to demonstrate in feasibility of increased agricultural production rapidly by concentrating on all factors of production at the same time in an integrated action programme in selected areas fulfilling optimum conditions.

The programme was popularly known as "PACKAGE PROGRAMME" because of the collective and simultaneous application of all improved practices : namely improved seeds. irrigation, fertilizer. plant protection, implements, storage facilities, marketing facilities and credit etc,

Initially 7 districts were covered under this programme namely (I) Thanjavur (TN). (2) West Godavari (AP). (3) Sahabad (Bihar), (4) Raipur (MP), (5) Aligarh (UP), (6) Ludhiana (Punjab). (7) Pali (Rajasthan). During Kharif of19W, additional 9 districts covered were (I) Alleppy (Kerala), (2) Palghat (Kerala), (3) Mandya (Karnataka), (4) Surat (Gujarat), (5) Sambalpur (Orissa), (6) Burdavan (W.B.), (7) Cachar (Assam), (8) Bhandara (Maharashtra), (9) Six blocks in (J & K).

The central idea of IADP was that increased agricultural productivity shall lead to economic growth which shall bring welfare to the society.

8.4.2.1 Achievements of IADP

1. The cultivators were provided simultaneously with all supplies and services at right time and in adequate quantities through co¬operatives.

2. Marketing and storage facilities were developed within bullock cart distance.

3. Covered all the important cash crop grown in the district, although emphasis was laid in the increase of food grains crops.

4. Rapid increases in agricultural production were achieved in all the IADP districts.

5. Involvement of small farmers and package approach was achieved.

6. 45% of the village and 30% of the total cultivated area in the selected district was covered by this programme.

7. Intensive efforts were made to use improved seeds and fertilizers over the entire area and encourage the adoption of improved farm practices.

5.4.2.2 Shortcoming of the IADP

• Educational approach to reach the cultivators was lacking.

• Training programme of staff was not clear, the VLW's were not able (6-impress the farmers.

• Staff was not clear about the methods to reach the cultivators. The staffs were target oriented even in filling up agricultural production plans.

• Posting of staff were not adequate and timely.

• Workshop seed testing and soil testing laboratories were not functioning to the required level.

• There was problem of communication

• Co-operative were not functioning well

• Transport and land development programmes were not progressing satisfactorily.

• There was lack of action research.

• Very little participation by women in the programme.

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5.4.3 Intensive Agriculture Area Programme (IAAP)

Even with the short coming of IADP, the spectacular results in improved crop yield obtained in IADP, prompted the Government to think of extending the benefits of improved technology in agriculture in large areas over the country at less cost and with reduced staff strength. This resulted in launching of the INTENSIVE AGRICULTURAL AREA PROGRAMMES (IAAP) in 1964. This was similar to but a less intensive extension programme in comparison to that of the IADP. 114 districts were selected in the year 1964 and later extended to 150 districts.

5.4.3.1 Achievements

Achieved increased production by exploiting the land resources.

Package approach were covered in 1410 communities blocks spread over 114 districts in India. In Karnataka 57 C.D. Blocks spread over 14 districts were covered.

Increased production by 20-25 per cent of the cultivated area was achieved.

Effective coordination between officials and nonofficial was achieved.

Multiplication of improved seeds and its distribution to all cultivated areas was possible.

5.4.4 High yielding variety programme (HYVP)

HIGH YIELDING VARIETY PROGRAMME (HYVP) was launched in 1966, which helped the country in attaining self-sufficiency in food. The technological development did not remain confined to the introduction of high yielding crop varieties alone. These were combined with the application of high analysis and balanced fertilizer, irrigation, plant protection, improved implements etc. which made a 'Green Revolution' possible in the country.

Agricultural scientists found successful in evolving new high yielding varieties in some cereals particularly in wheat, rice & maize, Punjab, Haryana & Western parts of UP were initially selected for this programme.

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The pervasive influence of high yielding technology spread to other area as of farm production such as animal production, fishery, sericulture, social forestry etc. The high yielding technologies in these production enterprises also have some common characteristics such as shorter gestation period, good response with better management; higher return fan terms of yield and income, and higher investment in comparison to traditional technologies.

High yielding technologies by themselves tend to be scale neutral i.e. farmers irrespective of the size of their holding can derive economic benefit from them provided they have access to the needed inputs. However, high yielding technologies are not resource neutral. In other words more inputs are required for higher output.

5.4.4.1 Objectives of HYVP

i) To assess the spread of the various high yielding varieties in different parts of the country and also determine the extent of such spread;

ii) To ascertain the reactions, attitudes of cultivators/participating cultivators; and

iii) To study the problems of implementation of the programme at different level of administration such as States, district, block and village.

iv) Besides above, the study also covered certain other important and relevant aspects such as research efforts in evolving of new varieties.

5.4.5 Integrated Rural Development Programme concept (IRDP)

5..4.5.1 Concept and origin of IRDP

IRDP is a very major programme of poverty alleviation and rural development. The meaning of the term integrated, basically implies the provision of a package of interlinked programmes mutually supporting and reinforcing so that a one-dimensional approach to development is avoided so, the integration is horizontal, vertical, spatial and temporal.

Integration covers four principal dimensions:

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i. Integration of sectoral programmes.

ii. Spatial integration.

iii. Integration of social and economic processes.

iv. The policies with a view to achieving a better fit between growth, removal of poverty and employment generation.

Specifically, it involves a sharp focus on target groups, comprising small and marginal farmers, agricultural laborers and rural artisans, and an extremely location specific planning in rural areas.

IRDP was envisaged to help small and marginal farmers, agricultural laborers and rural artisans.

The approaches followed for SFDA, MFAL, DPAP and CAD programmes were proposed to be utilized according to their relevance's in particular areas to generate employment opportunities and increase production.

5.4.5.2 Objectives of IRDP

The main objectives are creating assets, employment, increased income removal of poverty and minimizing in equality. IRD Programmes were

Programmes of Agriculture Development including efficient utilization of land and water resources with scientific technology.

Programmes of animal husbandry as a subsidiary occupation dirked mainly to small farmers and Agricultural Labour households. • Programmes of marine fishery including harvesting of natural resources through trawlers, mechanised country boats.

Programmes of social forestry and farm forestry.

Programmes of village and cottage industries including handlooms, sericulture and beekeeping as important occupations for the artisan classes of the rural population.

Programme of service sector of the rural economy as self-employment for poorer families.

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Programmes for skill formation and mobility of labour to meet the needs of organized labour for development works.

The IRDP concept was launched in 1978-79 in 2300 blocks in the country and it was extended to all blocks in the country with effect from 2to Oct. 1980. Simultaneously SFDA's were merged with IRDP.

5.4.5.3 Target Beneficiaries of IRDP

IRDP focuses mainly on providing assistance (subsidiary and institutional credit) to selected families for income generating assets in order to range their incomes through self-employment so that they can move above the poverty line.

IRDP follows the principle of the "poorest of the poor first". Hence, although the poverty line (PL) has been defined as Rs 6,400 as annual family income, only those families with an annual income of less than Rs 4,800 are eligible for assistance under this programme.

The target group includes: Small farmers, marginal farmers, agricultural laborers rural artisans and other families which are below the poverty line.

At least 30 per cent of the families are to be drawn from SC's/STS.

At least 30 per cent of the beneficiaries are to be women.

5.4.5.4 Implementation and funding of IRDP

The district rural development agency (DRDA) was created to function at the district level as a single agency for the implementation of IRDP, DPAP, DPP etc., to implement integrated rural development.

Funds for the programme are released to DRDA's on the stipulation that expenditure should be equally shared by the centre and the state.

5.4.5.5 Short comings/drawbacks of IRDP

The resources provided were inadequate.

There was large number of over dues.

Poor quality of assets provided to the beneficiaries.

The follow up of the beneficiaries was inadequate.

Lack of training facilities to s-mall and marginal farmers.

5.4.6. National Rural Employment Programmes (NREP)

The NREP was launched in 1980 with a view to significantly increase employment opportunities in rural areas. This was viewed as a major step towards poverty alleviation. The NREP replaced the food for work (FFW) programme.

5.4.6.1 Objective OF NREP

• Generation of Additional gainful employment for unemployed and under employed persons (Both men and women) in rural areas.

• Creation of productive community assets for direct and continuing benefits to the poor.

• Improvement in the overall quality of life in the rural areas.

Two main functions of NREP

• Creation of a large quantum of man days of work per year for the unemployed and under employed in rural areas, and

• Creation of durable community assets to strengthen infrastructural facilities in rural areas.

5.4.6.2 Features of NREP

• In all works under NREP, preference was given to landless labour.

• Among landless labour, preference was given to SC's/ST's for employment.

• Main provisions relating to works under NREP was that it was not permitted to engage contractors.

• Wages were paid partly in cash and partly in food grain 1-2 kg/day/head

• DRDA were responsible for the entire works relating to planning, implementation, coordination and monitoring of NREP.

• NREP was a centrally sponsored programme with equal sharing of the expenditure by the centre and the status.

• NREP provide training to the personnel in the implementation of the programme.

5.4.7 Jawahar Rozgar Yojana (JRY) 1989

The finance minister announced a new scheme which aimed at providing employment in backward districts with chronic poverty and unemployment. This new scheme was named as Jawaharlal Nehru Rozgar Yojana. It was also stated that NREP and RLEGP would be merged into one programme and implemented as a centrally sponsored scheme with a 80:20 sharing funds between the centre and the states. Later it was called as JRY.

5.4.7.1 Objectives of JRY

• To generate additional gainful employment for the unemployed rural youth.

• To create productive community assets which would benefit the poor sections thus, strengthening the rural infrastructure.

• To improve the overall quality of life in areas.

5.4.7.2 Main features of JRY

• The target group comprises persons living below poverty line.

• Preference is given to SC's and ST's among the poor.

• At least 30 per cent of the beneficiaries are women.

• All works which lead to creation of durable community assets can be taken up.

• Higher priority is to be given to works which are required as infrastructure under poverty alleviation programmes.

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• For social forestry works the participation of non-governmental organizations (NGOS) is ought.

• Wages under JRY could be paid partly in cash and partly in food grain (1.5 kg/ Man/day).

• DRDA's/ Zilla Parishads are responsible for implementation of JRY at district level and village panchayats at the Gram Panchayats Level.

5.4.8 Training of Rural Youth for Self Employment (TRYSEM)

Trysem was launched in 1979 as a separate national scheme for training rural youth for self employment. The compelling reasons for launching the programme being the huge backlog of unemployment and under employment among the rural youth. Forty youth, both men and women were to be selected in each block and trained in both skill development and entrepreneurship to enable them to become self-employed.

It was generating activities in the rural areas, the influx of rural youth to urban areas could curbed. Moreover, local needs could also met with local resources, thereby giving a fillip to rural development.

5.4.8.1 Objectives of TRYSEM

• To provide rural youth (18-35 years) from families below the poverty line with training and technical skills to enable them to take up self-employment in agriculture, industry, services and business activities.

• Training is perceived not only in terms of provision of physical skills. But also change in attitude, enhancement of motivation and skills in human relations etc., are also ought to be imparted.

• Self-employment is defined as gainful employment on a full time basis which results in income which is sufficient for the family of the youth cross the poverty line. Situation of employment in which the means of production are owned, hired or taken on lease are taken to be self-employment situations.

5.4.8.2 Features of TRYSEM

• TRYSEM became the "self-employment for youth" component of IRDP and was introduced in all the 5000 blocks in the country.

• An identified youth will be put through a period of training either in a training institution or under a master crafts men.

• Duration of training is flexible depending upon types of courses.

• Trainers are given stipend and a tool kit.

• Successful trainee is eligible to receive a subsidiary/credit/income generating asset under IRDP.

• At least 50 percent of the youth to be trained for self-employment either for secondary or tertiary sector activity.

• Wage employment training was to be in the secondary and tertiary sectors.

• BDO selects the eligible youth belonging to the target group with the help of VLW's.

• The identification of locations is done by the DRDA in consultation with district level officers of different departments.

• DRDA prepares a resource inventory for training facilities like ITI's polytechniques, KVI's, KVK's, NYK's etc.,

• DRDA is responsible for the implementation of TRYSEM.

5.4.8.3 Beneficiaries of TRYSEM

• Members of the poorest family first

• Priority should be given to members of SC's and ST's.

• At least 1/ 3 of candidates should be women.

• Preference should be given to persons who have completed the 12 month course under the national Adult Education programme.

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5.4.8.4 Short coming of TRYSEM

• Implementation is generally uneven.

• Training lacked appropriate technology in the package provided.

• In the selection of trade, self-employment opportunities and financial viability were not adequately assessed.

• Assistance in the provision of raw materials and marketing has been lacking.

• Every district did not have training centers of TRYSEM.

• In a large number of cases, the assistance provided to TRYSEM trainees from IRDP projects had no link to the training they had received.

5.4.9 Development of Women and Children in Rural Areas (DWCRA)

Our planners realized that women did not reap as much benefit out of IRDP as they were expected to. Hence, it was felt necessary to devise a special programme for women and children in rural areas. The rationale was that if people have a minimum basic nutrition only if they have a minimum income. Initially, income can be generated by giving access to rural assets. Moreover better skill endowment and training for women will enable them to derive better results from their work efforts.

5.4.9.1 Objectives of DWCRA

The basic objective of DWCRA is to provide rural women with productive income generating assets and credit, and enhance their skills.

It also seeks to provide an effective organizational support structure so that the women can receive assistance in the production of goods and services more effectively.

5.4.9.1 Features of DWCRA

1. The target group of DWCRA is those, families which have an annual income of less than Rs. 4,800.

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2. Under DWCRA, it is not individual families which receive assistance but the group.

3. It encourages the formation of groups each consisting of 15 to 20 women.

4. The financial assistance which is available for a group is as follows

i. Rs. 15,000 in the form as a onetime grant contributed in equal measure by the Government of India, State Government and UNICEF which may be used as.

• Working capital to process raw materials and for marketing purposes.

• Infrastructural support for income generating activities.

• Child care facilities.

ii. Travelling allowance at the rate of Rs. 2,000 per year for one year for the group organizers.

5. It was launched in 1982-83 as a pilot project in 50 districts chosen on the criteria of high infant mortality rate and low female literacy.

6. Although DWCRA is basically a programme to generate productive seats, it is not confined to providing economic benefits.

7. It includes supportive services like mother and child care, adult education, immunization etc.,

8. The task of planning, implementing and monitoring of DWCRA has been entrusted to DRDA, as DWCRA is part of IRDP.

9. One woman BDO, two woman VLW's and one Grama sevaka are responsible to implement the programme at the block level.

10. Project officer of DRDA remains the coordinating officer at district level; and the BDO at the block level.

11. The main financial assistance is provided by the central government'

12. The groups utilize grants for various purposes such as to build up infrastructural support and marketing facilities, purchase of raw materials, purchase of training kits, equipment for child care facilities.

13. DWCRA is to improve the socio economic conditions of women and children in rural areas, it is important to train women in viable activities such as tailoring, Knitting, bamboo making, fishing, soap making, candle making and pottery etc.

5.4.10 Swarnjayanti Gram Swarojgar Yojana (SGSY)

This Scheme was launched after a review and restructuring of the previous Integrated Rural Development Program(IRDP) and allied schemes like Training of Rural Youth for Self Employment (TRYSEM), Development of Women and Children in Rural Areas (DWCRA), Million Wells Scheme (MWS), Supply of Improved Toolkits to Rural Artisans (SITRA) & Ganga Kalyan Yojna. SGSY was launched on April 1, 1999 and is the only self employment Programme currently being implemented

5.4.10.1 Objectives of SGSY

The objective of the SGSY is to bring the assisted Swarozgaris above the poverty line by providing them income generating assets through bank credit and Government subsidy. The Scheme is being implemented on a 75:25 cost sharing of between the Centre and the States. In the Union Budget 2009-10, Allocations of Rs. 2350 Crore was made for establishing microenterprises in rural areas through activity clusters and group approach under Swaranjayanti Gram Swarozgar Yojana. At least 50% of the Swarozgaries will be SCs/STs, 40% women and 3% disabled.

5.4.10.2 Activities under SGSY

Focussed Approach to poverty Alleviation by setting up a large number of Micro enterprises in rural areas of our country.

Capitalising group lending and Overcoming the problem of running multiple programmes overlapping each other.

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A holistic programme of micro enterprises covering all aspects of self employment which includes organising rural poor into Self help groups.

Integration of various agencies like District Rural Development Agencies, Bank, Line Departments., Panchayati Raj Instituions, NGOs etc. Bring the assistated poor family above BPL by providing them a mix of income generating assets like bank credit + Government subsidy. India's Ministry of Rural Development is proposing to re-design the Swarnjayanti Gram Swarojgar Yojana (SGSY) into National Livelihood Mission (NRLM).

5.5 Selected development Programmes from 2000-2020

Most of the programmes are modified as per new objectives which are inclusive, sustainable and equitable in nature. The table 5.2 provided the brief account of programmes with their salient features.

Table 5.2 Rural development programmes from 2001-2020

Programmes	**Year of beginning**	**Distinct features**
Sampoorna Grameen Rozgar Yojna	2001	Providing employment and food security.
National Food for Work programme	2004	Supplementary wage as food grains for work
Bharat Nirman	2005	It comprises projects on irrigation, roads, housing, water supply, and electrification and telecommunication connectivity.
National Rural Employment Guarantee Scheme NREGS	2006	100 days wage employment for development works in rural areas.

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Rastriya Krishi Vikash Yojana (RKVY)	2007	aims at achieving 4% annual growth in the agriculture sector during the XI· Integrated
National food security mission (NFSM)	2007	Development of Food crops, including rice, wheat, coarse cereals, and pulses
National rural livelihood mission (NRLM)/ Ajeevika	2011	promoting self-employment and organization of rural poor
National livestock mission	2104-15	focusing on improving availability of quality feed and fodder
Provision of Urban Amenities in Rural Areas (PURA)	2004	Proposed by former President APJ Abdul Kalam in his book Target 3 billion.
National Rural Health Mission	2005	To provide accessible, affordable and quality health care
Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY)	2014	Skill development for rural youth
Saansad Adarsh Gram Yojana (SAGY)	2014	5 Adarsh Grams (1 per year) will be selected and developed by 2024.
Shyama Prasad Mukherji Rurban Mission (SPMRM)	2015	aims at transforming rural areas as growth engines for development to provide sustainable development and urban facilities in rural areas
Atmanirbhar Bharat Abhiyaan or Self-reliant India campaign	2020	Five pillars of Aatma Nirbhar Bharat – Economy, Infrastructure, System, Vibrant Demography and Demand.

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5.5.1 Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA

5.5.1.1 About MGNREGA

The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), also known as Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGS) is Indian legislation enacted on August 25, 2005. The MGNREGA provides a legal guarantee for one hundred days of employment in every financial year to adult members of any rural household willing to do public work-related unskilled manual work at the statutory minimum wage. The Ministry of Rural Development (MRD), Govt of India is monitoring the entire implementation of this scheme in association with state governments

This act was introduced with an aim of improving the purchasing power of the rural people, primarily semi or un-skilled work to people living below poverty line in rural India. It attempts to bridge the gap between the rich and poor in the country. Roughly one-third of the stipulated work force must be women.

Adult members of rural households submit their name, age and address with photo to the Gram Panchayat. The Gram Panchayat registers households after making enquiry and issues a job card. The job card contains the details of adult member enrolled and his /her photo. Registered person can submit an application for work in writing (for at least fourteen days of continuous work) either to Panchayat or to Programme Officer.

The Panchayat/Programme officer will accept the valid application and issue dated receipt of application, letter providing work will be sent to the applicant and also displayed at Panchayat office. The employment will be provided within a radius of 5 km: if it is above 5 km extra wage will be paid.

5.5.1.2 Key feature and objective of MGNREGA

MGNREGA guarantees hundred days of wage employment in a financial year, to a rural household whose adult members volunteer to do unskilled manual work.

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Individual beneficiary oriented works can be taken up on the cards of Scheduled Castes and Scheduled Tribes, small or marginal farmers or beneficiaries of land reforms or beneficiaries under the Indira Awaas Yojana of the Government of India.

Within 15 days of submitting the application or from the day work is demanded, wage employment will be provided to the applicant.

Right to get unemployment allowance in case employment is not provided within fifteen days of submitting the application or from the date when work is sought.

Receipt of wages within fifteen days of work done.

Variety of permissible works which can be taken up by the Gram Panchayaths.

MGNREGA focuses on the economic and social empowerment of women.

MGNREGA provides “Green” and “Decent” work.

Social Audit of MGNREGA works is mandatory, which lends to accountability and transparency.

MGNREGA works address the climate change vulnerability and protect the farmers from such risks and conserve natural resources.

The Gram Sabha is the principal forum for wage seekers to raise their voices and make demands. It is the Gram Sabha and the Gram Panchayat which approves the shelf of works under MGNREGA and fix their priority.

Objectives

Objectives of The Programme Include Ensuring social protection for the most vulnerable sections of people residing in rural India through wage employment opportunities

Ensuring livelihood security to the poor through creation of valuable assets leading to improved water security, soil conservation, higher land productivity, strengthening drought proofing and flood control.

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Ensuring empowerment of the marginalized communities in rural India, especially women Schedule Castes (SCs) and Scheduled Tribes (STs) and the aged through the rights based programme.

Implementation Status

The scheme was introduced in 200 districts during financial year 2006-07 and 130 districts during the financial year 2007-08

In April 2008 NREGA expanded to entire rural area of the country covering 34 States and Union Territories, 614 Districts, 6,096 Blocks and 2.65 lakhs Gram Panchayat.

The scheme now covers 648 Districts, 6,849 Blocks and 2,50,441 Gram Panchayats in the financial year 2015-16.

5.5.2 NRLM or AJEEVIKA

SGSY has been transformed into NRLM in 2011. Now the scheme is implemented in a mission mode (implies that projects have clearly defined objectives, scopes, and implementation timelines and milestones, as well as measurable outcomes and service levels)

5.5.2.1 Objective of NRLM

To enable poor household to access gainful self employment (employment which provide minimum wages) and skilled wage employment opportunity resulting in appreciable improvement in their livelihood which is sustainable, and for achieving this goal strong grassroots level institutions have to be built in the rural areas

5.5.2.2 Ultimate Goal of NRLM:

To bring every family in the rural area out of abject poverty (a condition characterized by deprivation to basic human needs of food, shelter, education, sanitation, drinking water and information. It depends not only on Income but also on access to services) so that they can enjoy a decent quality of life.

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Course Name	Fundamentals of Extension Education
Lesson 6	Transfer of Technology Programmes of ICAR
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
University Name	Kerala Agricultural University, Thrissur

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6.1 Objectives of the lesson

- To understand the concept of technology, technology transfer
- To get acquainted with the various technology transfer programmes
- To know about origin, broad objectives and activities of the LLP, ND, KVK, ORP and TARP.
- To know about origin, broad objectives and activities of the NATP, ATMA, NAIP, NICRA and ARYA

6.2 Glossary

Technology is a body of knowledge that can be applied in productive process

Technology transfer is the process by which science and technology are diffused through human activity

Innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption

Demonstration an act of showing or explaining to somebody how to do something or how something works

Technology assessment is the process of researching technology solutions, problems and risks

Technology Refinement is a generic term that encompasses various approaches for producing correct technology and simplifying existing one

Project is a set of activities that must be completed within a fixed timeline to accomplish a specific objective

Training is the process of inculcating knowledge, skill and attitude for a definite purpose

6.3 Concept and Characteristics of Technology

Technology refers to ways of making or doing things. It is derived from the Greek word " *techne*" meaning art or craft and "*logia*" meaning area of study.

A technology is a design for instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome. A

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technology usually has two components: i) a hardware aspect consisting of tool that embodies the technology as material or physical objects, ii) a software aspect consisting of information base for the tool.

According to Yotopoulos and Nugent (1976), a technology is a body of knowledge that can be applied in productive process.

Chattopadhyay (1976) pointed out the three attributes of a technology which will make it acceptable to farmers as: i) economic viability, ii) suitability and iii) conformity with the socio-economic attributes of farmers. Anderson (1979) suggested that a technology must be tested in three conditions of: i) resource appropriateness ii) needs appropriateness and iii) goal appropriateness.

On the basis of the above definitions, the following are the characteristics of a technology.

a. Science or scientific know- how

b. Art of systematic knowledge

c. Practical utility

d. Production potentiality

In nutshell, technology refers to the art of systematic knowledge of science or scientific know-how, which may be practically utilized in the related field for the purpose of boosting the production potentiality.

Technological development is the process of research and development of technology. Many emerging technologies are expected to become generally applied in the near future.

The new technology development process leans on the development through the use of a technology (e.g. by introducing products that are based on the new technology in the market).

The technology development stages include innovation, imitation, technological competition and standardization.

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6.4 Concept of Transfer of Technology

Technologies are generated for their application in the appropriate field. This involves transfer of technology (TOT) which is one of the important functions of extension service. Transfer of technology is needed for improving the production potential and productivity in farming.

Brooks (1966) defined "technology transfer" as the process by which science and technology are diffused through human activity. According to Shand (1976), TOT means translating the research findings or technologies into actual practice in the farms by recipients or farmers themselves. It implies the trial, evaluation and consequent adoption of technologies generated.

The components of technology transfer are enlisted as under: i) Science or scientific know-how, ii) Dissemination, iii) Application or utilization, iv) Adoption and v) Improved production.

A technology may be viewed as an appropriate technology for a society if its design is relevant to the real needs of that society, its use fulfill those needs, its continuance and development are based on the society's economic and technical ability to support, service, maintain and even improve upon it.

In farming, the number of potential adopters is very large and they live in different socio-economic and environmental conditions. So, in farming, location-specific technologies are more appropriate.

6.4 Models of transfer of technology

There are three basic models of transfer of technology viz; top down model, feedback model, Farmer participatory model

I. Top-down-model (Conventional model):Salient features

- Farmers act as passive recipients of technologies
- No contact between farmers and scientists
- Extension plays the role to persuade the farmers to adopt new technologies

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- In this model, the client's views and problems are not given due importance which is an inherent problem of this model.

II. Feedback model: Salient features

- Research values identification of target group and its problems.
- Close interaction between research and extension systems.
- Research is carried out both at research farms and farmers' fields
- Researchers include extension personnel and social scientists to have a holistic understanding of farmers' problems.

III. Farmer- back to- farmer model (Farmer participatory model): Salient features

- An alternative to the two models discussed earlier.
- Here the underlying assumption is that research must begin and end with the farmer.
- The farmers must be incorporated as fully active members of the problem solving team.

6.5 Technology Transfer programmes of ICAR

Technology Transfer programmes mainly focuses on the transfer the proven technology to the clientele considering need and interest of the farmers and farm women. ICAR as pioneer and primary organizations plays vital role on technology transfer.

Transfer of Technology programme of ICAR wider term ad includes process of technology development, adaptation, dissemination and integration into farmers system. TOT should not be concerned with only mechanically disseminating technologies to the rural people.

This means that TOT is not only a liner process with distinct parts and roles of research, extension and farming system, but a collaborative effort between the three partners. Each of the three functions of technology development, processing and dissemination has to be done in consultation with each other.

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Transfer of technology may be defined as the process by which science and technology are diffused throughout human activity.

The integration of research with quality education and a properly planned extension education system has been one of the fundamental foundations of this developmental strategy, which also led to revolutions in many other sectors of agriculture and allied enterprises. As a part of this strategy, several programmes of transfer of technology from research stations to farmers' fields were launched in the country.

These included different projects of the transfer of technology projects of the ICAR i.e 1. All India Coordinated Project on National Demonstrations 2. Operational Research Project 3. Krishi Vigyan Kendra (Agricultural Science Centre) 4. Lab to Land Programme and Other projects such as Technology Assessment and Refinement Programme (TARP), Frontline demonstration (FLD) Agriculture Technology Management Agency (ATMA), which also plays vital role in technology dissemination. All the above mentioned projects are discussed in detail:

Table 6.1 Technology Transfer Programmes of ICAR

Programmes	**Year of beginning**	**Objectives/Features**
All India Coordinated Research Projects	1957	unique mechanism for building a nationwide cooperative and interdisciplinary research network linking ICAR institutes with SAUs
National Demonstration Programme	1964-65	increasing the productivity per unit area and time by using proven agricultural technology
Krishi Vigyan Kendra (KVK)	1974	On-farm research, In service training, Vocational training of farmers, farm women, rural youths etc

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Operational Research Programme	1975	to demonstrate the technologies to the farmers and the extension workers on a watershed basis
Agricultural Scientists' Recruitment Board (ASRB)	1975	recruitment agency for all the posts of ICAR
National Research Centres	1978	concentrate fundamental research on specific crops
Lab-to-Land Programme	1979	to improve the economic condition of the small and marginal farmers and landless agricultural labourers,
Institution-village linkage programme (IVLP).	1995	based on participatory modes ensuring greater linkage between scientist and farmer in a bottom up approach
National Agricultural Technology Project	1998	aims at developing a transfer of technology (TOT) system that is demand driven, well integrated with research, and financially sustainable and accountable to stake holders of agricultural development
Agriculture Technology information center (A T I C)	1999	a 'single window' approach at the entrance of the ICAR Institute/State Agricultural Universities
National Agricultural Innovation Project (NAIP)	2006	To promote 'production to consumption systems research' in priority areas/ themes
National Initiative on Climate Resilient Agriculture (NICRA)	2011	to make farmers self-reliant by use of climate resilient agricultural technologies

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Attracting and Retaining Youth in Agriculture (ARYA)	2015	o attract and empower the Youth in Rural Areas to take up various Agriculture, allied and service sector enterprises
Farmers first	2015	Two terms 'enriching knowledge' and 'integrating technology' qualify the meaning of Farmer FIRST in Indian context.

6.6 National Demonstration (ND)

National Demonstration is a programme based on the concept of increasing the productivity per unit area and time by using proven agricultural technology. ICAR's National demonstration programme on major food crops was launched in 1964.

The basic purpose of programme was to show the genetic production potentiality of new technology of major crops per unit of land and per unit of time and to encourage the farmers to adopt and popularise the technologies for accelerating production and improved cultivation practices.

6.6.1 Objective of NDP

The main objective of this programmes are

1. To demonstrate convincingly to farmers the production potentialities of a unit area of the land by using high yielding varieties of crops and adopting a multiple cropping programme with full package of practices such as balanced use of fertilizers and effective water management techniques.

2. To demonstrate use of implement for different operations and use of soil testing laboratories for use of balanced fertilizer doses.

3. To fully exploit these demonstrations for the purpose of training farmers in improved cultivation practices and to use them as recognised and effective audio visual aids for the flow of latest research technology and results to farmers.

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4. To provide research workers a firsthand knowledge of the problems faced by farmers in growing high yielding varieties and to identify the constraints limiting the crop production.

5. To minimize the time lag between the research generated and its application in field.

6.6.2 Activities under NDP

The performance of high yielding varieties of cereals was very promising but its full production potential was not demonstrated on a large scale to the farmers. Higher yields obtained on the research station did not impress the farmers. Farmer preferred to see the performance of these varieties on their own farms. Moreover, the scientists were looking for scientific feedback from field which would ultimately help them further refine the technology.

At this juncture in 1965-66 the ministry of Agriculture, Government of India initiated a nationwide programme in which demonstrations are connected on farmer's fields. This was the beginning of National Demonstration project (NDP). Demonstrations under this project were carried out mainly by the scientists of the SAU's and ICAR institutes in neighboring villages.

The scientists were required to demonstrate the potentiality of new seeds and package of practice on an area varying from 0.4 ha to 1.0 ha on farmers field single crop demonstration are carried out for crops like wheat, paddy, sorghum, pearl millet and maize.

6.6.3 Procedure to conduct national demonstration

A demonstration has to be conducted on 0.4 ha land for full 1 year. Yield target of 9 tons of food grains for two crop per year per ha had been fixed. If achieved the difference in the yield levels show the gap between how much is produced and how much can be produced and how much can be produced by the farmers. A sum of Rs. 500 per year for three crops (Multiple demonstrations) was given for meeting the cost of critical inputs. For the first crop the amount was Rs. 200 and for subsequent crops Rs. 150 each has been embarked.

The NDP was implemented at district level by a team of 4 subject matter specialists. Farmer was entrusted with the responsibilities to conduct the demonstration on farmer's field. They also organise field days at the time when important field operations were performed. Thus a large number of farmers got educated about new technology demonstrated on farmer's field.

In all 25 demonstrations per season were laid on the farmers field in each district. Very intensive cropping system techniques of soil and water management including use of machinery and plant protection were demonstrated under National Demonstration Project (NDP). Thus this demonstration served as pace settlers which are the first demonstrations and are to be emulated by local extension workers and farmers.

6.7 Front Line Demonstration (FLD)

The main objective is to demonstrate the production potentiality of improved package of various crops under the farmer's conditions and resources. The FLD's are conducted on various major crops of the district viz., sorghum, maize, pigeon pea, castor, paddy etc. the main emphasis was to introduce new crop genotypes along with improved practices and critical inputs which were new and hitherto not adopted by the farmers.

However, during FLD's programme emphasis was given to increase production and productivity of major oil seeds, pulses cereals and other crops keeping in view the importance given to these crops at national level.

Before the starting of the season, crop wise meeting are used to be held in the village by which KVK staff gets an opportunity to assess the situation and select demonstrator farmers for each crop. The input requirements are worked out for each participating farmer. Next, preseason training programmes are used to be conducted in the village itself.

Another way of preparing the farmers for FLD is to intensively visit the corners of village and selecting and spot if any farmer who is interested in the adopting of a particular technology. The selection of a good demonstrator may pose a problem if there is competition among the farmers.

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The situation arises out of this can be settled by following the set criteria for conducting FLD's farmer who comes forward voluntarily to join the programmes without expecting any critical inputs are given importance.

Another method is to forge functional linkages with line departments like agriculture and NGO's who helps KVK in extending the FLD in different parts of the district. This is for mutual advantage and farmers will get needed help from different organization at the same time.

Another aspect of conducting FLD's is in large numbers in a bigger area spreading over different blocks in the district. This helped the KVK especially in expanding the area under maize crop in a shorter period.

The number of FLD's is more and large number of farmers is participating, the rate of adoption was found to be faster and higher as it happened in case of maize. Due to this the time lag between introduction of technology and its adoption is also proved to be less. However, this can be achieved only if resources are made available to cover a large number of farmers.

6.7.1 Appropriate Technology for FLD

In order to demonstrate the potential technologies suitable to cropping system of the KVK operational area and also to achieve the natural goal of increasing oil seeds and pulse production in the country. Attention was given towards the following for educating the farmers.

- Timely supply of quality seed to increase seed replacement ratio.
- Specific management practices with special emphasis on low cost technologies.
- INM with greater emphasis on biofertiliser.
- IPM with botanicals and biopesticides.
- Use of new HYV, use of nutrients, efficient water use, plant protection etc.

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6.8 Lab to land Programme (LLP)

LLP was launched in 1979 as a part of golden jubilee celebrations of ICAR. The programme intended to improve the economic condition of small, marginal farmers and landless agricultural laborers specially SC's and ST's by transfer of improved technology developed by agricultural universities and research institutions.

6.8.1 Broad objectives of the programme

The specific objectives of the Lab to Land Project are as follows:

1. To study and understand the background and resources of the selected farmers and landless agricultural labourers. To introduce low cost relevant agricultural and allied technologies on their farms/houses for increasing their employment production and income.

2. To assist the farmers to develop feasible farm plants keeping in view the availability of technologies, needs and resources of the farmers, and the resources which could be made available from external sources/agencies.

3. To guide and help the farmers in adopting improved technologies as per their farm plans and demonstrate to them the economic viability of those technologies as well as methods of cultivation and farm management.

4. To organize training programmes and other extension activities in relation to their adopted practices, and prepare them for active participation in agricultural development programmes of the state departments of agriculture.

5. To make the farmers aware of the various opportunities and agencies which they could utilize to their economic advantage.

6. To develop functional relations and linkages with the scientists/Institutions for future guidance, advisory services and help.

7. To utilize this project as a feedback mechanism for the agricultural scientists and extension functionaries.

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6.8.2 Criteria for selection of participating farm family

1. Blocks/villages/farm families should preferably be selected from IAD blocks.

2. Villages having larger proportion of families belonging to categories of SF, MF, LL, SC and ST to be selected.

3. Selected villages should be on a cluster village basis and proximity to the implementing agency to be kept in mind for effective implementation of the programme.

4. While selecting villages, existence of schools, co-operative society, and effective village panchayats should be kept in mind.

Small farmers: Cultivators with land holding 2.5 to 5 acres of dry land (1.25 to 2.5 acres of irrigated land).

Marginal farmers: Cultivators with land holding up to 2.5 acres of dry land (1.25 acres of irrigated land).

Agricultural Labourer: Without any land holdings but having a homestead and drawing more than 50% of their income as agricultural wages.

6.8.3 Organization

For effective implementation and monitoring of the programme, whole country is divided into 8 zones based on agro climatic conditions, population and administrative infrastructure. Each zone is headed by a zonal co-ordinator, who is assisted by two programme officers. The labs to land canters are the grassroot level units for implementation of the programme.

A programme coordinator for each lab to land centres will head the team of specialists drawn from various disciplines viz., agriculture, veterinary science, fisheries, home science etc., which is constituted by the implementing agency.

A zonal advisory committee consisting of the representatives of the participating agencies, state departments like agriculture, animal husbandry, fishery and rural development meets 2 to 3 times a year for guiding and making appraisal of the programme at the zonal level. Four types of implementing agencies are involved in the programme.

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1. Agricultural university

2. ICAR Institutes

3. State department of agriculture

4. Voluntary organization

6.9 Krishi Vigyan Kendra (KVK)

Krishi Vigyan Kendra (KVK) is an innovative science based institution which undertakes vocational training of farmers, farm women and rural youths; conducts on farm research for technology refinement and front line demonstrations to promptly demonstrate the latest agricultural technologies to the farmers as well as the extension workers. The KVK functions on the principles of collaborative participation of scientists, subject matter experts, extension workers and farmers.

Imparting learning through “work experience” to those who are engaged in farming is the main purpose of KVKs. The syllabus and programme of each KVK is tailored to the felt needs of the farmers, resources and potential for agricultural growth in a particular area.

“Teaching by doing” and “learning by doing” are the main methods of imparting skill training. The first KVK was established in 1974 in Pondicherry under Tamil Nadu Agricultural University (TNAU).

Recently there has been a shift in the approach and objectives of the KVK. While initially the emphasis was mainly on ‘human resource development through training the farmers and extension workers, now the KVKs also participate in the process of agri-technology development and refinement.

Emphasis is also on employment generation to bring about equality of opportunities for socio-economically deprived class of farmers and traditionally back-ward areas in the country including dry land areas.

6.9.1 Mandates of KVK

In the present context of agricultural development where participation of farmers and extension agencies has become imperative in the technology

generation process, the mandate of the KVKs has been widened to encompass on farm research and frontline demonstrations. The detailed mandates are as follows.

1. Collaborate with the subject matter specialists of the state Agricultural universities/Scientists of the regional research station, NAEP and the state extension personnel in "on farm testing", refining and documenting technologies for developing region-specific sustainable land use systems.

2. Organize training to update the extension personnel within the area of operation with emerging advances in agricultural research on regular basis.

3. Organize long term vocational training courses in agriculture and allied vocations for the rural youths with emphasis on "learning by doing" for generating self employment through institutional financing.

4. Organize front-line demonstration in various crops to generate production data and feedback information.

The KVK is a fully fledged institution consisting of its own buildings – demonstration farm and units, equipments, vehicles etc. The building facilities include main KVK building, farmers hostel, staff quarters and demonstration units. The demonstration farm is normally laid down on the 20 hectares farm land.

The three fundamental principles, viz.: (i) Agricultural production as the prime goal, (ii) Work-experience as the main method of imparting training, and (iii) Priority to weaker sections of the society, is the backbone of the KVK programme.

6.9.2 Activities of the KVK

Based on the mandates, the following activities are performed.

1. On-farm research

2. In service training

3. Vocational training of farmers, farm women, rural youths etc.

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4. Front line demonstration and other extension activities.

(1) On-Farm Research (OFR)

On farm research is an adaptive research which is conducted on farmer's fields by the farmers with the support from scientists/subject-matter specialists. It is conducted with a farming systems perspective.

The main objective of OFR is to identify existing inputs of practices that might help solve major problems of many farmers in a defined study area. Farming system perspective implies " seeing things from the farmers viewpoints".

(2) In service training

The KVKs has been given the responsibility of conducting in service training of grass route level extension workers like VEWs and others working in Government and non Government development organizations.

These training programmes are normally arranged in collaboration with the state department of agriculture and state agricultural university. The importance of such training programmes has increased since the introduction of a Panchayat Raj System in the country.

(3) Vocational training of farmers

This had been the major mandate of the KVKs in the past and will continue to be so in future as well. The objective is to organize long term vocation based and skill oriented training for farmers, farm women, rural youths and school drop-outs so that they could adopt new methods of farming and increase farm income thus, the emphasis is not on crops but on vocations.

The potential trainees are selected by the KVK staff in consultation with the district development departments.

(4) Front line demonstrations (FLD) and other extensional activities

The KVKs organize front line demonstrations which aim at demonstrating the production the potentialities of newly released and pre-released production technologies of cereals, pulses and oil seeds and farmers fields.

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These are called frontline demonstrations because the technologies are demonstrated for the first time before being fed into the main extension system. The KVKs have also been given the responsibility of conducting at least some good integrated farming system demonstration which could serve as model for extension agencies.

Presently there are 11 zonal coordinating units located in eleven ATARI of the country. Now 721 KVKs are functioning

6.10 Operational Research Project:

The Operational Research Project (ORP) aimed at disseminating the proven technology in a discipline/area among farmers on a watershed basis, covering the whole village or a cluster of villages, and concurrently studying constraints (technological, extension or administrative) as barriers to the rapid spread of improved technical know-how.

The conceptual framework of ORP was that it was primarily devoted to demonstrating the impact of new technologies on a large scale involving a whole village or a cluster of villages at a time. It attempted to involve allied agencies and institutions to show the need for inter-institutional and interdisciplinary approach, the method and the way they could be made to work together.

The ORPs were initiated in 1974-75. The ORPs demonstrated latest agricultural technologies on the farmers' fields to influence the farmers as well as the State extension agencies. It also studied the socioeconomic, technological, extension and administrative barriers which were coming in the way of rapid transfer of technologies and pointed out the same to the extension agencies.

The ORPs considered two kinds of problems: first, the common agricultural problems affecting the farming community requiring group or community action e.g. plant protection and rodent control; and secondly, total resources development of the watershed area.

6.10.1 Objectives of ORP

The specific objectives of ORP were as follows:

1. To test, adopt and demonstrate the new agricultural technology on farmers' fields in a whole village or in a cluster of few contiguous villages/watershed areas.

2. To determine the profitability of the new technologies and their pace of spread among the farmers.

3. To identify the constraints both technological, as well as socio-economic which are barriers to rapid change.

4. To demonstrate group action as a method of popularizing the modern technologies at a faster rate.

6.11 Technology assessment and refinement programme (TARP)

The Indian council of Agricultural Research launched an innovative technology assessment and refinement Programme called Institutions Village Linkage Programme (IVLP) during 1995. The concept is based on participatory modes ensuring greater linkage between scientist and farmer in a bottom up approach.

It ensures access to agricultural technologies generated by the entire ICAR institutes or SAU or by the entire agricultural research in the country to the farming community in a village or a cluster of villages representing around 1000 farm families.

6.11.1 Objectives

The specific objectives of the programme are

1. To introduce technological interventions, with emphasis on stability and sustainability along with productivity for small farm –production system.

2. To introduce and integrate appropriate technologies to sustain productivity and profitability, taking environmental issues into consideration in a comparatively well defined production system.

3. To increase the agricultural productivity with marketable surplus in commercial farm production system with on and off –farm value addition.

4. To facilitate adoption of appropriate post harvest technologies for conservation and on – farm value addition of agricultural products, by products and wastes for greater economic dividend.

5. To facilitate adoption of appropriate technologies for removal of drudgery, increased efficiency and higher income of farm women.

6. To monitor socio-economic impact of the technological intervention for different production system.

7. To identify extra pollution domains for new technology or technology modular based on environmental characterisation at micro and macro levels.

8. Organising PRA (Participatory Rural Appraisal).

6.11.2 Specific aims of the project

In this programme there is change in the concept and philosophy as well as in application of methodologies that are different from the conventional methods and tools used in the research process. In this paradigm the concept of agro econ system analysis using participatory rural appraisal (PRA) tools are used instead of conventional survey research.

Its basic idea is that community itself based on its rich experiences should characterise its own resources, situation and problems, should identify the areas of activity, keeping its own goals and requirements into consideration; should develop the programme for technology assessment, and should finally refine the technology suiting its own condition and requirements.

6.12 National Agricultural Technology Project (NATP)

National Agriculture Technology programme was conceived as a pilot project. It was launched in November, 1998. It was an initiation of government of India with World Bank Assistance. Under this project, Innovations in Technology Dissemination (ITD) component has been planned, which aims at developing a transfer of Technology (TOT) system that is demand driven, well integrated

with research and financially sustainable and accountable to stake holders of agricultural development.

The innovation in technology dissemination (ITD) component of the project aimed at addressing key constraints in technology generation, validation and dissemination by introducing new institutional models and operational reform process in selected states. The states were namely Bihar, Andhra Pradesh, Himachal Pradesh, Jharkhand, Maharashtra, Orissa and Punjab. The project was pilot tested in four districts of above mentioned each states.

6.12.1 Objectives

The overall objective of NATP was to revitalize the agriculture technology generation assessment, refinement and dissemination systems.

- Increase the quality and type of technologies disseminated through
- Location specific technology development.
- Diversification and intensification of farming systems.
- Use of sustainability enhancing technologies.
- Enable research and extension systems to become demand driven and responsible for solving problems of farmers.
- Strengthen research-extension-farmers (R-E-F-) linkages.
- Increase financial sustainability of the system.

Shared ownership of agricultural Technology System (ATS) by key stakeholders i.e. farmers especially poor, women and disadvantaged, public sector research and extension agencies like ICAR, SAUs, DOA etc.

6.13 Agricultural Technology Management Agency (ATMA)

ATMA is a society of key stakeholders involved in agricultural activities for sustainable agricultural development in the district. The registered office of the ATMA is located at district collectorate premises. It is a focal point for integrating Research and Extension activities and decentralizing day to day management of the public Agricultural Technology System (ATS).

It is a registered society responsible for technology dissemination at the district level. As a society, it receives and expends project funds, enter into contracts and agreements and maintain revolving accounts that can be used to collect fees and thereby recovering operating cost.

The ATMA at district level is responsible for all the technology dissemination activities at the district level. It has linkage with all the line departments, research organizations, non-governmental organizations and agencies associated with agricultural development in the district. Research and Extension units within the project districts such as ZRS or substations, KVKs and the key line Departments of Agriculture, Animal Husbandry, Horticulture and Fisheries etc. are constituent members of ATMA.

Each Research Extension(R-E) unit retains its institutional identity and affiliation but programmes and procedures concerning district-wise R-E activities are determined by ATMA Governing Board and implemented by its Management Committee (MC).

Goals of ATMA

1. Decentralize decision-making to the district level.

2. Increase farmer input into programme planning and resource allocation, especially at the block level.

3. Increase programme coordination and integration, and to increase accountability to stakeholders. As a society, it would be able to receive and expend project funds, entering in to contracts and agreements and maintaining revolving accounts that can be used to collect fees and thereby recovering operating cost.

Specific aims of the project:

1. To identify location specific needs of farming community for farming system based agricultural development;

2. To set up priorities for sustainable agricultural development with Farming Systems Approach;

3. To draw plans for production based system activities to be undertaken by farmers/ultimate users;

4. To execute plans through line departments, training institutions, NGOs, farmer's organizations and allied institutions;

5. To coordinate efforts being made by various line departments, NGOs, farmers organizations and allied institutions to strengthen research extension-farmers linkages in the district and to promote collaboration and coordination between various State funded technical departments;

6. To facilitate the empowerment of farmers/producers through assistance for mobilization, organization into associations, cooperatives etc. for their increased participation in planning, marketing, technology dissemination and agro-processing etc.

7. To facilitate market interventions for value addition to farm produce.

Advantages of ATMA

1. ATMA is more effective in technology generation as it encourages location-specific solutions, keeping the resources of the farmers in mind.

2. As ATMA ensures a greater coordination among sister departments, it helps in better management of farms by the farm families.

3. Participation is the basic principle of ATMA. Involvement of women in both ATMA

Governing Board and Management Committee would bring about women empowerment.

4. ATMA seeks a greater linkage with research and extension.

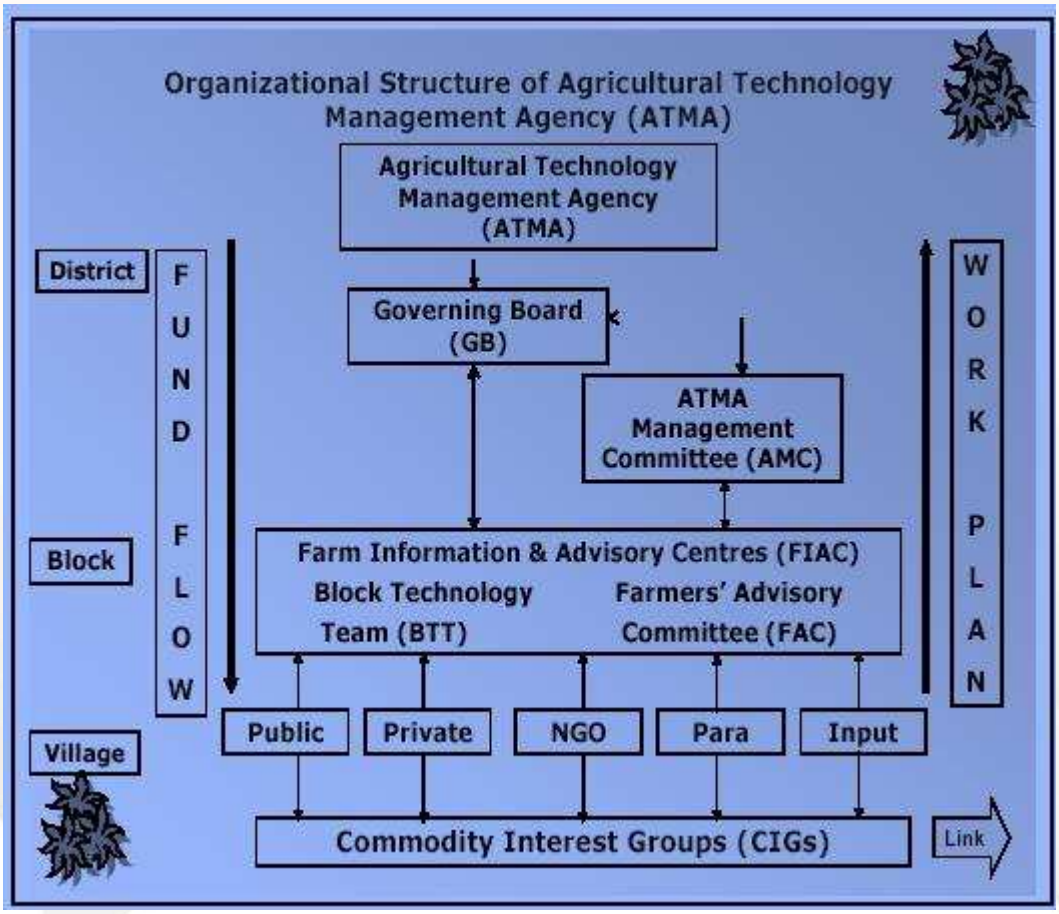
5. ATMA provides a single window extension system by creating FIAC at the block level.

Farmer can get any advice and suggestions from there only.

6. ATMA has an effective feedback mechanism.

7. Strategic Research and Extension Plan (SREP) to accelerate agriculture development in the project district. The SREP is the basic document which not only decides the development activities that need to be carried out but also in which manner and by whom it has to be done

Fig. 6.1: Organisational structure of ATMA



6.14 AGRICULTURE TECHNOLOGY INFORMATION CENTER (ATIC)

The establishment of an agricultural Technology Information Centre will provide such a mechanism beyond the individual unit of a research institution to contribute to the dissemination of the information. This will serve as a single window delivery system for services and products of research for the areas in which the concerned institute is involved.

The diverse nature of agriculture and changing extension approach has raised the search by farmers for future availability of seed, planting materials and

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other materials, easy accessibility to diagnostic services for soil fertility and plant protection, availability of appropriate information through leaflets and pamphlets and increased scope in sale of consultancy services.

Often the farmers are not aware as to whom and where to approach for field problems. It is felt that the facility of a 'single window' approach at the entrance of the ICAR Institute/State Agricultural Universities will enable the farmers to have the required information for the solution to their problems related to the areas in which the concerned institute is involved.

The rationale for establishment of ATIC are

1. To provide diagnostic services for soil and water testing, plant and livestock health.

2. To supply research products such as seeds and other planning materials, poultry strains, livestock breeds, fish seed, processed products, etc, emerging from the institution for testing and adaptation by various clientele.

3. Providing information through published literature and communication materials as well as audio visual aids.

4. Providing an opportunity to the institutes/SAU/s to generate some resource through the sale of their technologies.

6.14.1 The important criteria of Agricultural Technology Information are

1. Availability (or accessibility) of new technologies,

2. Relevance of new technologies;

3. Responsiveness of new technologies to the needs of different categories of farmers; and

4. Sustainability of such unit within the overall institutional system

6.15 National Agricultural Innovation Project (NAIP)

NAIP was launched with the financial assistance from World Bank after recently concluded NATP, which accords high priority to generation and

transfer of agricultural technologies, and suggests innovations in the technology system.

Objectives of NAIP

In order to address the problems plaguing Indian Agriculture, it is critical to redirect and augment resources devoted to agricultural research to the farming and livelihood systems of the poor rural communities. To utilize the technological breakthroughs that are already available for commercial use, the agricultural research priorities and strategies will have to be revisited and new system-wide approaches need to be developed and adopted.

The NAIP envisages putting up a coordinated effort on the following:

- Policy and technology options will be screened or tested by the end-user for applicability as well as for economic, social and environmental sustainability.
- In the applied and adaptive research projects, the end-user of innovations will be involved from the start of programme and projects and will remain partner till their completion.
- Both indigenous knowledge and frontier technologies will be used to generate the targeted products.

The specific objectives envisaged are:

- To build the critical capacity of the ICAR as a catalyzing agent for management of change in the Indian NARS (Component 1)
- To promote 'production to consumption systems research' in priority areas/ themes to enhance productivity, nutrition, profitability, income and employment (Component 2)
- To improve livelihood security of rural people living in the selected disadvantaged regions through technology-led innovation systems, encompassing the wider process of social and economic change covering all stakeholders (Component 3)

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- To build capacity to undertake basic and strategic research in frontier areas to meet challenges in technology development in the immediate and predictable future (Component 4)

6.16 National Initiative on Climate Resilient Agriculture

National Initiative on Climate Resilient Agriculture (NICRA) was launched during February 2011 by Indian Council of Agricultural Research (ICAR) with the funding from Ministry of Agriculture, Government of India.

Objectives:

- To enhance the resilience of Indian agriculture covering crops, livestock and fisheries to climatic variability and climate change through development and application of improved production and risk management technologies
- To demonstrate site specific technology packages on farmers' fields for adapting to current climate risks
- To enhance the capacity building of scientists and other stakeholders in climate resilient agricultural research and its application.

Project Components

Both short term and long terms outputs are expected from the project in terms of new and improved varieties of crops, livestock breeds, management practices that help in adaptation and mitigation and inputs for policy making to mainstream climate resilient agriculture in the developmental planning. The overall expected outcome is enhanced resilience of agricultural production to climate variability in vulnerable regions. The project is comprised of four components.

1) Strategic research on adaptation and mitigation

2) Technology demonstration on farmers' fields to cope with current climate variability

3) Sponsored and competitive research grants to fill critical research gaps

4) Capacity building of different stake holders

The 21 Institutes of the Indian Council of Agricultural Research are there for the strategic research.

Key features:

- Critical assessment of different crops/zones in the country for vulnerability to climatic stresses and extreme events, in particular, intra seasonal variability of rainfall.
- Installation of the state-of-the-art equipment like flux towers for measurement of green house gases in large field areas to understand the impact of management practices and contribute data on emissions.
- Rapid and large scale screening of crop germplasm including wild relatives for drought and heat tolerance through phenomics platforms for quick identification of promising lines and early development and release of heat/drought tolerant varieties.
- Comprehensive field evaluation of new and emerging approaches of paddy cultivation like aerobic rice and SRI for their contribution to reduce the GHG emissions and enhance water saving.
- Special attention to livestock and fishery sectors including aquaculture which have not received enough attention in climate change research in the past. In particular, the documentation of adaptive traits in indigenous breeds will be the most useful step.
- Thorough understanding of crop-pest/pathogen relationship and emergence of new biotypes due to climate change.
- Simultaneous up-scaling of the outputs both through KVKs and the National Mission on
- Sustainable Agriculture for wider adoption by the farmers

6.17 Attracting and Retaining Youth in Agriculture (ARYA)

ARYA scheme was launched in 2011 by Indian Council of Agricultural Research

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Objective of ARYA Project:

- To attract and empower the Youth in Rural Areas to take up various Agriculture, allied and service sector enterprises for sustainable income and gainful employment in selected districts.
- To enable the Farm Youth to establish network groups to take up resource and capital intensive activities like processing, value addition and marketing.
- To demonstrate functional linkage with different institutions and stakeholders for convergence of opportunities available under various schemes/program for sustainable development of youth.
- The scheme envisages the increasing participation of youth, to sustain agriculture and allied activities through scientific methods. The objectives and significances are:
- To increase the profitability of Agriculture.
- To improve the quality of life in Rural Areas.
- To transform Youths especially Rural into Agricultural Entrepreneurs.
- To implement scientific methods of farming in Agriculture.
- To increase production in Agriculture allied activities.

ARYA is to be implemented by Krishi Vigyan Kendras which each would train around 200-300 youths. These youths will be trained in Farming, Bee Keeping, Dairy & Poultry Farming, Cattle rearing etc. and will be helped in getting Loans from Banks.

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Course Name	Fundamentals of Extension Education
Lesson 7	Communication: Meaning, Definition, Elements and Selected models
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
University Name	Kerala Agricultural University, Thrissur

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7.1 Objectives of the Lesson

- To get basic idea about the meaning and concept of communication
- To explain the nature of communication
- To understand the concept and elements of communication process
- To know the various functions of communication
- To discuss about selected models of communication

7.2 Glossary

Communication is the process of transmitting / ideas, information, and attitudes from the source to a receiver

Communicator is the person who starts the process of communication in operation

A message is the information a communicator wishes his audience to receive, understand, accept and act upon

Channels are the physical bridges between the sender and the receiver of messages

Treatment of messages relates to the technique, or details of procedure, or manner of performance, essential to expertness in presenting messages

Fidelity is the faithful performance of all the element of communication process

Audience is the intended receiver of messages

Response by an audience to messages received is in the form of some kind of action to some degree, mentally or physically

Feedback means carrying some significant response of the audience back to the communicator

7.3 Meaning and concept of communication

Communication is the continuous never ending universal and most significant activities for everyone. The living and nonliving entities symbolize some meaning which is communication. In fact, we cannot imagine life without

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communication; since it is an in-built function helping us in our day-to-day activities.

The word communication has been derived from the Latin word *'communis'* which means 'common'. Thus, communication means sharing of ideas in common. "When we communicate," Says Wibur Schramn, "we are trying to establish'commonness' with someone. That is we are trying to share information, an idea or an attitude. The essence of communication is getting the receiver and the sender 'turned' together for a particular message."

According to the shorter Oxford English Dictionary, communication means "the imparting, conveying or exchange of ideas, knowledge, etc., whether by speech, writing or signs." Communication takes place when one person transfers information and understanding to another person. It refers to the exchange of ideas, feelings, emotions, knowledge and information between two or more persons.

There is a communication when you talk or listen to someone. For instance, a extension workers while delivering his lecture to communicates the message of government to the farmers. But if he speaks or writes in a language which is not understandable to the farmers, there is no communication. When you read a book, its author communicates to you. But communication does not mean merely written or oral messages.

It includes everything that may be used to convey meanings from one person to another, e.g., movement of lips or the wink of an eye or the wave of hands may convey more meaning than even written or spoken words. In fact, communication is the process of conveying message from one person to another so that they are understood.

Communication can be conceptualized as the

(i) Process of social interaction (i.e.) in communication selection, two of more individuals interacts.

(ii) It apparently influences the ideas, attitude, knowledge and behaviour of each other.

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(iii) In a face-to-face situation, it is not a mere exchange of information, but something more, apart, because in such a situation along with information, gestures, expressions, language, the manner of expression and for all produce impact.

Some kind of change occurs as a result of interaction.

The change may be visible in terms of knowledge and behavioral change. For example, adoption of technology or practice of agriculture leads to behavioral change.

7.4 Definition of communication

"Communication is the process of transmitting / ideas, information, and attitudes from the source to a receiver for the purpose of influencing with intent". E M Rogers

Communication is a process by which two or more persons' exchange ideas, facts, impressions in way that each gains a common understanding of the meaning, content and useof message. J. Paul Leagan (1961)

All educational and action programmes in agricultural are communication. Coleman& Marsh

All the procedure by which one mind can affect another is communication. Shannan & Weaver (1949)

Communication is anything that conveys meaning that carries a message from one person to another. Brooker (1949)

"Communication is the discriminatory response of an organism to stimulus". Stevens (1942)

"Communication is the arrangement of environmental stimulus to produce certain desired behavior on the part of the organism". Thayar (1967)

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"Communication may be defined as a process by which an individual-the communicator, transmits (usually verbal symbols) to modify the behavior of other individuals communicates". Hovland (1964)

"Communication is the control of behavior through descriptive and reinforcing stimuli". Hortman (1966)

"Communication is a purposeful process, which involves sources, messages, channels, and receivers". Andersch et al. (1969)

7.5 Nature of communication

It is s a process: communication is Dynamic; on-going; ever-changing; continuous act. No beginning, end, or fixed sequence of events. One can't really freeze the communication at any point of time.

It employs many means: It takes place by many means, at many levels, with many people, in many ways, for many reasons.

It involves interdependence: It is a two-way process, where constant reversal of role(s) is there. Level of interdependence varies from situation to situation

It involves at least two persons: Communication involves at least two persons, a sender and a receiver. The sender is called communicator and the receiver of the message is known as communicate. A person who speaks, writes or issues some instructions is the sender and the person for whom the communication is meant or who receives the message is the receiver or communicates.

Message is a must: A message is the subject matter of communication. For example, the contents of the letter or speech, order, instructions or the suggestions are message. A communication must convey some message. If there is no message, there is no communication.

Communication may be written, oral or nonverbal: Communication is generally understood as spoken or written words. But in reality, it is more than that. It includes everything that may be used to convey meanings from one

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person to another, e.g., movement of lips, or the wink of an eye or the wave of hands may convey more meaning than even written or spoken words.

Communication is a two way process: It involves both information and understanding. Communication is not complete unless the receiver has understood the message properly and his reaction or response is known to the sender. Understanding is the end result of communication but it does not imply agreement.

It takes place at many levels: Intrapersonal- Communication takes place within an individual; Interpersonal- Between or among persons; Intra-organization- Communication takes place within an organization; and Inter-organization- Communication takes place between or among organizations.

Its primary purpose is to motivate a response: The primary purpose of communication is to motivate response or influence human behaviour. There is no doubt that motivation comes from within but communicator can also motivate people by good drafting of message, proper timing of communication, etc. To create understanding, communication should be relevant to the situation. It must always be remembered that communication is a means of motivating and not an end itself.

Communication may be formal or informal: Formal communication follows the formal channels provided in the organizational structure. For example, in the ELP programmes, the Managing Director communicates with the departmental heads, say, manager communicates to Assistant manager, the Assistant manager with students and so on.

It flows up and down and also from side to side: Communication flows downward from a superior to subordinate and upward from subordinate to a superior. It also flows between two or more persons operating at the same level of authority.

It is an integral part of the process of exchange: It refers to the exchange of ideas, feelings, emotions and knowledge and information's between two or more persons.

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Communication fidelity varies from one communication situation to another: Fidelity is the faithful performance of all the element of communication process. Perfect communication is very rare and effectiveness of communication varies with situation.

7.6 Significance of communication

7.6.1 Four Fundamental Functions of communication

a. The information function serves to provide knowledge to the individuals need for guidance in their actions. It also fulfills worker's desires for awareness of things that affect them.

b. The command and instructive functions serve to make the employee aware of his obligations to the formal organization and to provide him with additional guidance on how to perform his duties adequately.

c. The influence and persuasion function (also known as motivational function) encourages the appropriate individual to perform or to exhibit certain behaviour. Messages communicated are used to convince individuals that their actions can be personally or organizationally beneficial.

d. The integrative function refers to the fact that the communication of messages / ideas, if properly handled, should help to relate the activities of the workers to their efforts complement rather than detract from each other. Work efforts are unified rather than fragmented as a result of properly integrative communication. Employees can perform well and be involved in their work only when they understand their job duties and responsibilities. Unless the organization's key goals, values and strategies are communicated to employees, they will not work in that direction.

7.6.2 Basic purpose of communication

Basic purpose of communication is creation of meaning. Meaning exists in the mind of the people, but not in the words. In fact, communication vehicles (viz. words, symbols signs) don't have meaning in/of themselves, but people have meaning for them. Moreover, meanings aren't transmittable in nature.

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Four Types of meaning 1) denotative, 2) structural, 3) contextual and 4) connotative

Denotative meaning of communication can be understand by Word-Object relationship and Sign-Object relationship (e.g. +,-, ×, /, ( ), etc.). It can be visualize as dictionary/descriptive meaning (exception: Exact meaning of the word) and also got clear meaning with picture

Structural meaning can be seen as sign-sign relationship while contextual meaning different meaning in different context e.g. mental ability test(s) of banks(s).

Connotative meaning shows a relationship between a sign, an object and a person. words may have value or extremely personal meaning (s), in this case. Person-oriented in nature (e.g. words like good, beautiful, pleasant, etc.)E.g. she is a beautiful woman! (It is a judgment. judgments are sentences emphasizing this meaning. connotation is more personal, and it varies more among people.

7.7 Scope of communication

Communication has unlimited scope in every field of life. As extension personnel the scope of communication is very broad that may be with higher authorities or with subordinates or with farmers.

I. Oral: An average man spends 70 % of his precious time on communicating verbally and spends 10 to 11 hrs/day on oral communication and sends our ideas for other's perception.
II. Non-verbal: Through symbols like gesture, facial expressions, movement of arts, raising eyebrows, rolling eyes, starring look, stern look etc., would make communication effective.
III. Communication can be made possible in different ways, levels and reasons. E.g.: An extension worker reads the letters - written communication received or else. Communicate his subordinates through message slip about his work.

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a) An extension worker speaks to farmer in a meeting - spoken communication.

b) He addresses a gathering - A group communication will persist there.

c) He contemplates for the next month's programme (Introspect) - A self-communication.

IV. Communication in employment - provides opportunities to get employment accessibility in journalism, advertising, filmmaking, public relations, televisions, television programme coordinator and audio-visual counselor.

V. Communication industry - Opinion seekers, attitude researchers and marketing researchers etc., play their roles in communication.

VI. Communication in management - In any management sector, everything is done only by means of effective communication between superior-subordinate, superior-employees at lower levels, labourers, experts, skilled workers. As administration grow, even the machine operator spends more time in manipulating symbols.

VII. Communication removes the time lag - Communication has an inbuilt snowball that makes the message reach its audience instantly without any delay. What occurs today may be obsolete tomorrow. Hence, the day to day development can be diffused immediately without any lag and gets introduced among the mass.

7.8 Communication Process

The Process of Communication is the two way process in which a person initiates through selecting a message with proper encoding. The encoded message is send to the receiver with the help of medium, the channel. The receiver decoded the message and response to the communicator back.

Communication is a two-way process involving the following elements: a sender, a message, a medium, a channel, a receiver, a response and feedback. However, it is not sufficient to have just all these elements; there should be cooperation and understanding between the two parties involved. It is

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important to have a common frame of reference or context for successful and meaningful communication, e.g. a common language or common interpretation of a gesture.

Essentially communication involves the sender or the communicator and the receiver. Both should necessarily share a mutually accepted code e.g. a common language. The context in which the communication takes place is called the “communication environment”.

The content of the code is sent in a certain medium (oral, written or non-verbal) using channels (air, mikes, body, pictures, text, etc.) in the form of encoded messages.

The “code” is not restricted to only language; it may also involve the use of costumes, gestures, colors among other things. The process of communication can be described in the following manner: The sender sends a “message” using a “medium” and a “channel” to the “receiver”. The message arrives in the sensory world of the receiver.

The receiver’s brain filters the message on the basis of his/her knowledge, emotions, attitudes, and biases and gives the message a unique meaning. This meaning may trigger a response which the mind of the receiver forms.

The receiver encodes his/her response and sends it across as “feedback” into the sensory world of the sender. This completes one cycle of communication and the process continues in a cyclic manner, i.e. cycle after cycle, as long as the people involved care to communicate.

The components of the communication process can be listed as follows:

1. Idea or impulse that arises in the sender’s mind
2. Formal expression of the idea or impulse using a medium and channel: encoding
3. Interpretation of the message by the receiver: decoding
4. Reaction or response of the receiver

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5. Conveying the reaction/response in the feedback using a medium and channel

6. Decoding of the feedback received

7.9 Elements of Communication and their characteristics

Characteristics of Elements of extension communication system: The characteristics of each of the elements which may contribute to the success or failure of communication are furnished as per Leagans

7.9.1. The communicator

This is the person who starts the process of communication in operation. He is the source or originator of messages. He is the sender of messages. He is the first to give expression to messages intended to reach an audience in a manner that results in correct interpretation and desirable response. Poor communicators does not following characteristics fail to deliver effective result of the communication process.

The following are the characteristics of a good communicator

He knows:

a) His objectives - has them specifically defined;

b) His audience - its needs, interests, abilities, predispositions;

c) His message- its content, validity, usefulness, importance;

d) Channels that will reach the audience and their usefulness;

e) How to organise and treat his message;

f) His professional abilities and limitations.

He is interested in:

a) His audience and its welfare;

b) His message and how it can help people;

c) The results of communication and their evaluation;

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d) The communication process;

e) The communication channels - their proper use and limitation;

f) How to improve his communication skill.

3. He prepares:

a) A plan for communication - a teaching plan;

b) Communication materials and equipment;

c) A plan for evaluation of results.

4. He has skill in:

a) Selecting messages;

b) Treating messages;

c) Expressing messages - verbal and written;

d) The selection and use of channels;

e) Understanding his audience;

f) Collecting evidence of results.

Poor communicators, on the other hand-

- Fail to have ideas to present that are really useful to the audience
- Fail to give the complete story and show its relationship to people problems
- Feel they are always clearly understood
- Talk while other are not listening
- Fail to recognise others view point
- Fail to recognise that communication is a two way process

7.9.2. Message or Content

A message is the information a communicator wishes his audience to receive, understand, accept and act upon. Messages, for example, may consist of

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statements of scientific facts about dairy technology relevant to the farmers or consumer or entrepreneur.

Potential messages range as wide as the content of the programmes. Messages related to programmes of change are, therefore, the relevant 'cargo' to be carried to people by the channels of communication.

They are the important content, sometimes referred to as 'arguments' 'appeals' and 'stimuli'. Whether messages operate effectively as incentives to changed behaviour in any given situation depends on a wide range of influences.

A successful communication is one in which the major factors influencing the message are controlled as far as possible. This is the responsibility of the communicator. Fuzziness in the message distort the real meaning of communication

A good message must be:

1. In line with the objective to be attained;

2. Clear – understandable by the audience

3. In line with the mental, social, economic and physical capabilities of the audience.

4. Significant – economically, socially or aesthetically to the needs, interests and values of the audience

5. Specific – no irrelevant material;

6. Simply stated covering only one point at a time.

7. Accurate – Scientifically sound, factual and current;

8. Timely – especially when seasonal factors are important and issues current

9. Supported by factual material covering both sides of the argument;

10. Appropriate to the channel selected

11. Appealing and attractive to the audience – having utility, immediate use.

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12. Applicable – audience can apply recommendation;

13. Adequate – Combining principle and practice in effective proportion;

14. Manageable – can be handled by the communicator with high professional skill and within the limits imposed by time.

7.9.3. Channels of communication

The sender and the receiver of messages must be connected or 'tuned' with each other. For this purpose, channels of communication are necessary. Channels are the physical bridges between the sender and the receiver of messages and the avenues between a communicator and an audience on which messages travel to and fro.

They are the transmission lines used for carrying messages to their destination. Thus, the channels serve as essential tools of the communicator.

A channel may be anything used by a sender of message to connect him with intended receivers. The crucial point is that he must get in contact with his audience. But channels are no good without careful direction or use in the right way, at the right time, to do the right job for the right purpose with the right audience, all in relation to the message.

A channel may be classified as per the audience target viz: individual, group and mass. It may be classified as audio, visual and audio-visual aids

Many obstructions can enter channels. These are often referred to as 'noise' - that is some obstruction that prevents the message from being heard by or carried over clearly to the audience..

To help overcome some of the problems, one should take the following factors into account:

1) The specific objective of the message.

2) The nature of the message-degree of directness versus abstractness, level of difficulty, scope, timing etc.

3) The audience-size, need, interest, knowledge of the subject etc.

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4) Channels available that will reach the audience or parts of it

5) How channels can be combined and used in parallel.

6) How channels that must be used in a series can be reduced to the minimum, and those used made effective without fail

7) Relative cost of channels in relation to anticipated effectiveness

8) Time available to communicator and audience

9) Extent of seeing, hearing or doing that is necessary to get the message through

10) Extent of cumulative effect or impact on the audience necessary to promote action

The foregoing are some of the proven guides to handling communication channels in ways that they deliver the message.

7.9.4. Treatment of messages

Treatment has to do with the way a message is handled to get the information across to an audience. It relates to the technique, or details of procedure, or manner of performance, essential to expertness in presenting messages.

Designing the methods for treating messages does not relate to formulation of the message or to the selection of channels, but to the technique employed for presentation within the situation provided by a message and a channel.

The purpose of treatment is to make the message clear, understandable and realistic to the audience. Designing treatment usually requires original thinking; deep insight into the principle of human behaviour and skill in creating and using refined techniques of message presentation.

At this point, the effective teacher is separated from the less effective one, and the art of teaching comes into play. Great teachers are adequate in all ways, but are superb in their ability to “treat” messages.

Treatment of messages can be varied in an almost infinite number of ways. The following are the three categories of basis useful for varying treatment.

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A. Matters of general organisation:

1) Repetition or frequency of mention of ideas and concepts

2) Contrast of ideas.

3) Chronological- compared to logical, compared to psychological.

4) Presenting one side compared to two sides of an issue.

5) Emotional compared to logical appeals.

6) Starting with strong arguments compared to saving him until the end of presentation.

7) Inductive compared to deductive.

8) Proceeding from the general to the specific and vice versa.

9) Explicitly drawing conclusions compared to leaving conclusions implicit for the audience to draw.

B. Matters of speaking and acting:

1) Limit the scope of presentation to a few basic ideas and to the time allotted. Too many ideas at one time are confusing.

2) Be yourself. You can't be anyone else. Strive to be clear, not clever.

3) Know the facts. Fuzziness means sure death to a message.

4) Don't read your speech. People have more respect for a communicator who is sure of his subject.

5) Know the audience. Each audience has its own personality. Be responsive to it.

6) Avoid being condescending. Do not talk or act down to people or over their heads. Remember, good treatment of messages result in hitting the 'bull's eye', not the surrounding terrain. Never over-estimate the knowledge of an audience or underestimate its intelligence.

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7) Decide on the dramatic effect desired. In addition to the content of messages, a communicator should be concerned with 'showmanship'. Effective treatment requires sincerity, smoothness, enthusiasm, warmth, flexibility and appropriateness of voice, gestures, movements and tempo.

8) Use alternative communicators when appropriate, as in Group discussions, panels, interviews, etc.

9) Remember that audience appeal is a psychological bridge to getting a message delivered.

10) Quit on time. Communicators who stop when they are "finished" are rewarded by audience goodwill.

C. Matters of symbol variation and devices for representing ideas:

The possibilities for message treatment can be extended and the techniques used in an almost infinite number of combinations. Communicators should be aware that treating messages to achieve maximum audience impact is a highly professional task.

Treatment is a creative task that has to be 'tailor made' for each instance of communication. Following are the Matters of symbol variation and devices Word symbols- speech, Real objects, Models ,Specimens, Photographs, Graphs, Charts, Motion pictures, Slides, Drama, Puppets , Songs, Flash cards etc.

7.9.5. The Audience

Obviously, an audience is the intended receiver of messages. It is the consumer of messages. It is the intended respondent in message -sending and the assumed to be in a position to gain economically, socially or in other ways by responding to the message in particular ways.

In good communication, the audience aimed at is already identified by the communicator. The 'pay of' in communication is dependent on what the audience does in response to messages.

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An audience may consist of one person or many. It may comprise men, women, or both; youth groups, villagers or their leaders. An audience may be formed according to occupation groups as farmers or artisans; professional groups, as engineers, educators, administrators etc.

In addition to knowing the identity of an audience and some of its general characteristics, there are other somewhat more specified aspects that help to clarify the exact nature of an audience and how to reach it. The following are some of these:

1) Communication channels established by the social organisation.

2) The system of values held by the audience - what they think is important.

3) Forces influencing group conformity-custom, tradition etc.

4) Individual personality factors susceptibility to change etc.

5) Native and acquired abilities.

6) Educational, economic and social levels.

7) Pressure of occupational responsibility-how busy or concerned they are.

8) People's needs as they see them, and as the professional communicator sees them.

9) Why the audience is in need of changed ways of thinking, feeling and doing.

10) How the audience views the situation.

It is useful to a communicator to understand these and other traits of an audience in making his plan for communication. Like the marksman, unless a communicator sees his target clearly, he can shoot a thousand rounds, and yet accomplish nothing.

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It may be noted that the audience is not a passive recipient of message. The individuals are rather selective in receiving, processing and interpreting messages.

Selective Exposure: Klapper (1960) suggested that people expose themselves to messages selectively. There is a tendency for individuals to expose themselves relatively more to those items of communication that are in agreement with their ideas, beliefs, values etc.

Selective perception: Regardless of exposure to communication, an individual's perception of a certain event, issue, person or place could be influenced by one's latent beliefs, attitudes, wants, needs or other factors. Thus, two individuals exposed to the same message could go away with different perceptions about it.

Selective retention: All information is not retained by the individuals. People generally tend to retain that information in which they have some interest and which they consider to be important.

Research showed that even recall of information is influenced by factors such as an individual's needs, wants, moods, perceptions and so on.

7.9.6. Audience response

This is the terminating element in communication applied to rural development programmes. Response by an audience to messages received is in the form of some kind of action to some degree, mentally or physically. Action, therefore, should be viewed as a product, not as a process; it should be dealt with as an end, not as a means.

Consequently, the five elements we have just analysed-communicator, message, channel, treatment, audience-are intended to be viewed as an organised scheme (means) for attaining the desired action (end) on the part of an intended audience.

Action taken by an intended audience that can be attributed to a given communicative act by an extension worker may properly be assumed to be a result of the degree to which these elements have been effective.

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Until the desired action results, programmes of change do not achieve their most essential objective. In evaluating effectiveness, therefore, the important criterion or standard for judging the programme is the nature and extent of action taken by people who needed to act. For, it is what the people do as a result of participation, not what the programme staff does that is of transcendent importance in programmes of change.

The number of possible kinds and degrees of response to messages received are almost infinite. The following gives an idea of possible variety in response that may result when a useful messages is received by a typical village audience of Indian cultivators.

1. Understanding vs. Knowledge: Knowledge of facts alone does not constitute understanding. It is only the first step. Understanding is attained only when one is able to attach meaning to facts, see the relationship of facts to each other and to the whole of a proposition and the relationship of the total body of facts to the problem under consideration. Communicative effort often fails because it stops simply with laying facts before people and does not continue in a systematic way to promote an understanding of the facts presented.

2. Acceptance vs. rejection: A free, alert and thinking human mind requires that understanding precede acceptance of facts and propositions. In turn, it insists on mental acceptance before resorting to action. For, it is what human beings come to believe, not what they merely know or even understand, that determines what they do when they are free to act as they choose.

3. Remembering vs. forgetting: When opportunity for action is not immediately available or action is delayed, the factor of forgetting what was learned influences the kind and extent of action taken at any point of time in the future. This basic principle has extensive implications for timing in communication programmes. Transmitting the right message to the right people at the right time is often a crucial factor in successful communication.

4**. Mental vs. physical action**: Changes in the mind of man must always bring changes in the actions of his hands. In short, man's mind controls his overt

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behaviour. Consequently, a message suggesting physical action could receive all the mental action required, except the final decision to act. This is sometimes referred to as 'lip service'.

5. Right vs. wrong: The intent of a communication is to promote desirable action by an audience as determined by the communicator and expressed in his objectives. Consequently, resulting action in line with the intended objectives is assumed to be 'right' action. But the problem is more complex. Unfortunately, 'noise' often plays mischief at this point. For a variety of reasons, people often fail to behave precisely according to instructions, even when they understand and accept them.

7.9.7. Feed back

Extension communication is never complete without feedback information. Feedback means carrying some significant response of the audience back to the communicator. .

Communication work is not an end in itself. The extension agent should know what has happened to the audience after the message has reached them.

Feedback has the following characteristics.

1. Feed back is source oriented
2. Varies in different communication situations.
3. affects the source or communicator.
4. Exerts control over future messages
5. Affects communication fidelity.
6. Maintains the stability and equilibrium of the communication system.

Feedback should be a continuous process as audience and communicators are neither always the same persons nor they are interacting in the same situation. The extension agent shall take steps to analyse the responses of the audience, which may be positive, negative or no response. Adequate and correct feedback is essential for purposeful communication.

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Feedback may be verbal (through words) or non-verbal (in form of smiles, sighs, etc.). It may take written form also in form of memos, reports, etc. Feedback may be immediate or delay feedback

7.10 Key concept related t o communication process

Frame of reference: Each person has stored experience of beliefs and values as an individual and as a member of the society. This provides the background of stimulation which influences a person's behaviour in a particular situation and is called the individual's Frame of Reference

The functionally interrelated external and internal factors operating at a given time constitute the frame of reference of the ensuing reaction. A message received by an individual is interpreted in terms of the frame of reference of the individual.

Perception: Gibson (1959) has defined Perception as the process by which an individual maintains contact with the environment.

Kollar, Blackwell and Engel (1970) explained Perception as the process whereby an individual receives stimuli through the various senses and interprets them. Perception is influenced by the environment in which communication takes place. It is not the intrinsic quality or attribute of an object, individual or message, but how people individually and collectively perceive them is important for extension.

Credibility: Credibility is the degree to which a communication source is perceived as trustworthy and competent by the receiver. It means trustworthiness and competence before the audience accepts any message

Communication fidelity: According to Berlo (1960), Fidelity is the faithful performance of communication process by all its elements: Communicator, message, channel and receiver.

Noise and Fidelity are two sides of the same coin. Eliminating noise increase fidelity, the production of noise reduces fidelity. The communication fidelity finally can be explained as the extent of desirable changes in receivers'

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behaviour as a result of communication. The desirable changes are in receiver's knowledge, attitude and action.

Time lag in communication: LAG means delay. Communicator shall compute this time lag. The communicator shall plan and initiate the communication action well in advance so that the intended message reaches the audience in time.

Communication gap: Communication gap refers to the difference between what was communicated by the extension agent (communicator) and what has actually been received by the audience.

Empathy: Empathy is the ability on the part of one person to understand the other person's frame of mind and reference, and accept the same. This acceptance does not mean agreement.

Empathy can be defined as the ability of an individual to project oneself into the role of another person to be able to appreciate the feelings, thinking and actions of another person. (Rao, 1993)

Homophily and Heterophily: According to Rogers (1995), a fundamental principle of human communication is that the exchange of ideas occurs most frequently between individuals who are alike, or homophilous.

Homophily is the degree to which pair of individuals who interact are similar in certain attributes such as belief, attitudes, values, education, social status and the like.

Heterophily is the degree to which pairs of individuals who interact are different in certain attributes such as belief, attitudes, values, education, social status and the like.

Entropy: Entropy is defined as the ability to reduce the uncertainty or disorganisation of a system at the receiving end

Noise: Sometimes messages do not get through the source and the receiver because of distracting and unwanted stimuli. This distraction is called noise.

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You have undoubted have had the experience of talking to someone else about something you considered important and being abruptly interrupted.

7.11 Problems or Barriers to effective communication

Filtering: Refers to the manipulation of information by the sender so as to obtain a favorable opinion from the receiver. Example, an employee updating his superior about projects in which there is significant progress but not informing him about the projects that are lagging behind. The process of filtering information takes place at each level of the organization and may sometimes affect the quantity as well as the quality of information that reaches the top management. The amount of information that gets filtered increases with the number of vertical levels in the organizational hierarchy. Filtering may lead to problems in the long term as only pleasant information is allowed to pass up to the top management and thus they may not know about a problem till it assumes serious proportions.

Selective perception: A person perceives information on the basis of his needs, values, experience, and background. His personal interests and expectations influence the way he decodes information.

Defensiveness: People intentionally attempt to block communication when they feel that the other person is threatening their self-image and prestige. They react in a defensive manner by making sarcastic comments, by passing judgments on others, or by questioning the motives of the other party.

Language: Words convey different meanings to different people. Age, education and cultural background are the major factors that influence the use of language by people and the meanings they associate with words.

Barriers to communication can be further classified as

- ✓ Technical problems;
- ✓ Semantic problems; and
- ✓ Influential problems.

1) Technical problems: These are problems concerned with the accuracy of the transference of information from sender to receiver. Certain things that are not intended by the information source are added to the signal. These

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unwanted additions may be distortions in the shape or shading of a picture or errors in transmission. All these changes in the signal are called 'noise'.

2) Semantic problems: Problems regarding the interpretation of meaning by the receiver as compared to the intended meaning of the sender. This is a very deep and involved situation even if one is dealing only with the relatively simple problems of communication through speech.

3) Influential problems: The problems of influence or effectiveness are concerned with the success with which the meaning is conveyed to the receiver leads to the desired conduct on his part. It may seem, at first glance, undesirably narrow to imply that the purpose of all communication is to influence the conduct of the receiver.

7.12 Selected models of communication

Models may be used to show the size, shape or relationship of various parts or components of an object or process. A model is useful in explaining the working of a system.

Models are often a useful way to examine the working of a phenomenon, such as: communication, because they minimize, simplify, highlight major facts of a theory.

A few important models are illustrated as follows:

7.12.1. Aristotle model: According to Aristotle Model, communication process has three elements

1. Speaker – Person who speaks

2. Speech – The speech that the individual produces

3. Audience – The person who listens

Fig.7.1 Aristotle model

This is simple linear model in which message is send to the receiver.

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7.12.2. Shannon-Weaver model (1949): model is consistent with Aristotle's proposition.

According to them, the ingredients of communication are-

Fig.7.2 Shannon Weaver model

Compared with the Aristotelian model, the source is the speaker, the signal is the speech and the destination is the audience, plus two added ingredients, a transmitter which sends out the source's message and a receiver which catches the message for the destination.

The transmitter is the new element added in addition to the information source, message, sign, receiver and noise In Shanon and Weaver (1949) model, the major elements involved in the communication process are:

1. Information source
2. Message
3. Encoding
4. Channel
5. Noise
6. Decoding
7. Receiver/Audience
8. Audience response / Feed back
9. Attitudinal change

7.12.3. Lasswell model of communication (1948)

Lasswell model defined communication is the process in which "WHO says WHAT to WHOM in WHAT CHANNEL with WHAT EFFECT?"

Fig.7.3 Lasswell model

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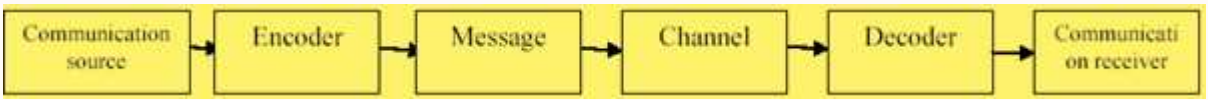
7.12. 4. Berlo's model (1960) of communication process consists of

Fig.7.4 Berlo model



Code is a system of signals for communication. Encode means to put the message into code or cipher. Channel means the medium through which the signals move, the decoder means which converts the message in the code into ordinary language which may be easily understood.

He further elaborated that all human communication has some source, some person or group of persons with a purpose. The purpose of the source has to be expressed in the form of message.

The communication encoder is responsible for taking the ideas of the source and putting them in a code, expressing the source's purpose in the form of a message. A channel is a medium, a carrier of message. For communication to occur there must be somebody at the other end, who can be called the communication receiver, the target of the communication.

Fig.7.5 Berlo model

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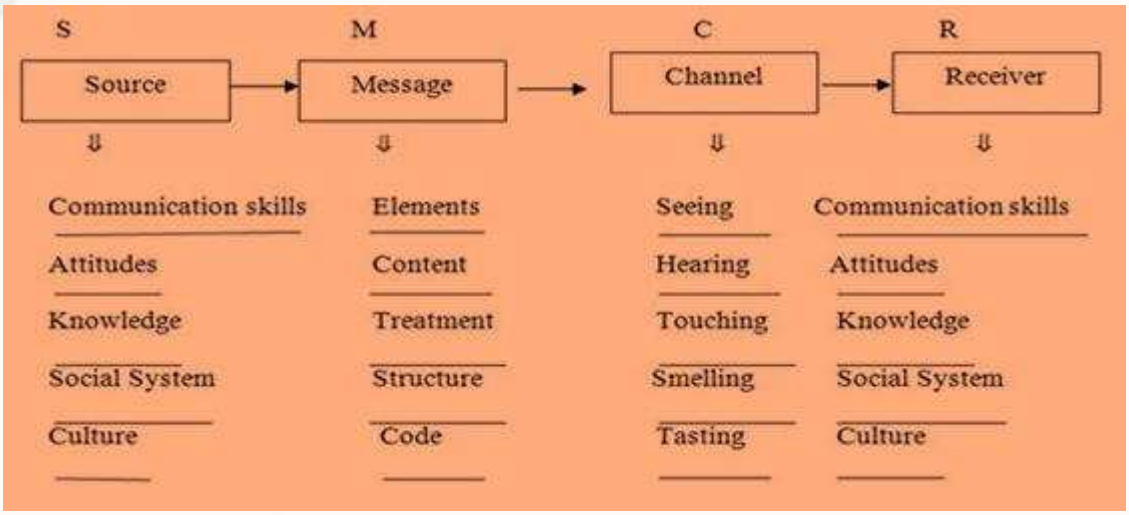


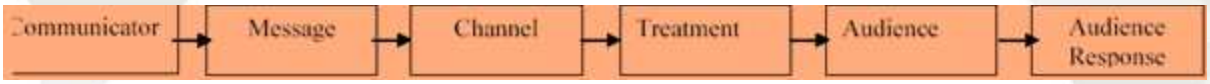
7.12.5. **Schramm (1961),** model of communication process involves

Fig.7.6 Schramm model

This model of communication is particularly relevant for the mass media. In human communication it is most important whether the people can properly encode or decode the signal i.e., message and how they interpret it in their own situations.

7.12.6. Leagans (1963) of communication process has the following elements

Fig.7.7 Leagans model



The task of communication, according to him, is to provide powerful incentives for change.

Success at this task requires through understanding of the six elements of communication, a skilful communicator sending useful message through proper channel, effectively treated, to an appropriate audience that responds as desired.

7.12.7. Rogers and Shoemaker (1971) thought of communication process in terms of **S-M-C -R-E** model, the components of which are

Fig.7.8 Rogers and Shoemaker model

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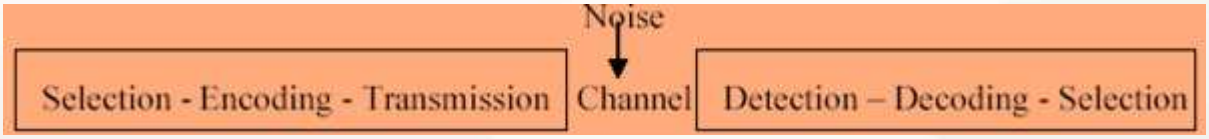
According to them a source (S) sends a message (M) via certain channels (C) to the receiving individual (R), which cause some effects (E) i.e. changing the existing behaviour pattern of the receiver.

Communication in extension may also be thought of as two-way stimulus-response situation in which the necessary stimulus is provided by the communicator, the extension agent, in the form of a message, which produces certain response on the audience, the farmers and vice-versa. A favourable response by the audience reinforces learning.

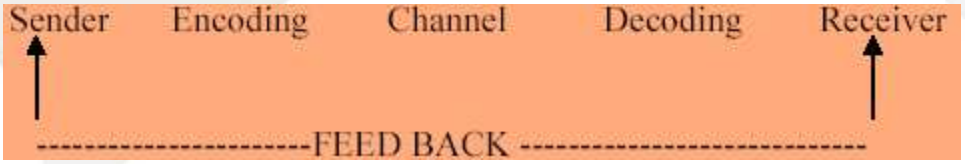
7.12.8. Litterer's model of communicatin process

Fig.7.9 Litterer model



7.12.9. Westley-Maclean's model of communication process

Fig.7.10 Westley-Maclean's model



7.12.10. Leagan's model (1963) of extension communication system.

A diagrammatic representation of the extension communication system on the basis of the model suggested by Leagans (1963) is presented as

Fig.7.11 Leagan's model extension communication system

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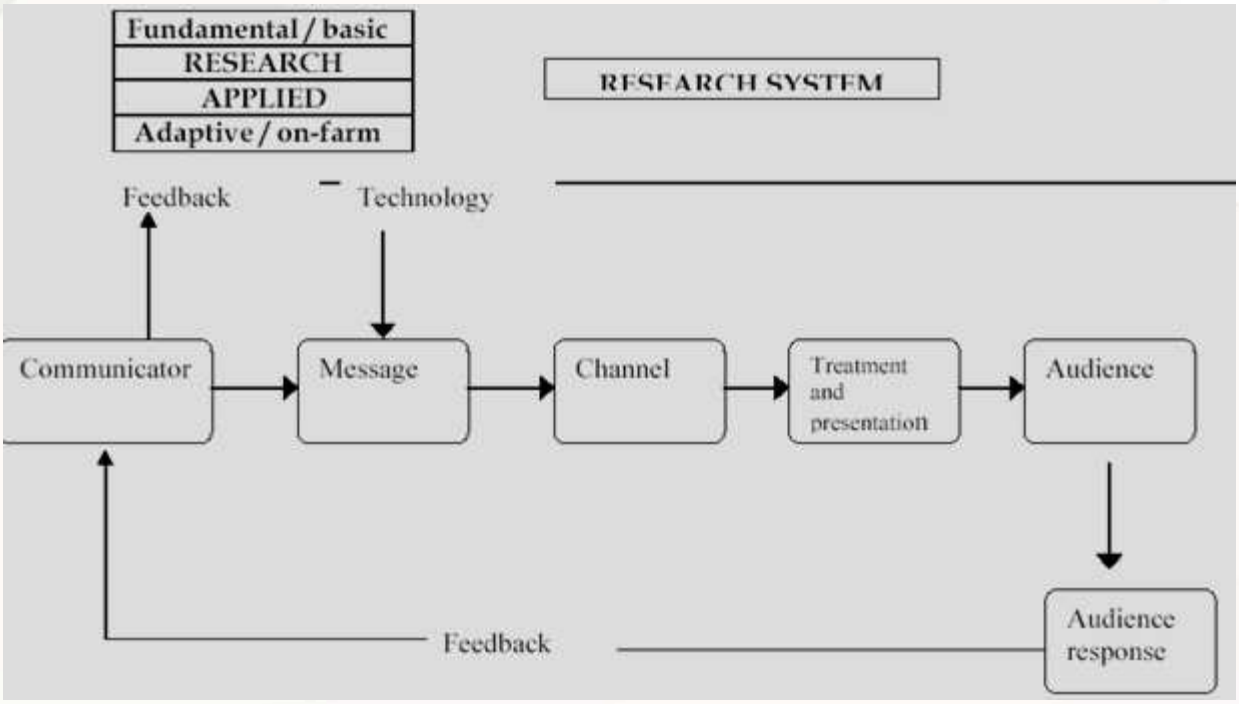

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Course Name	Fundamentals of Extension Education
Lesson 8	Types of Communication and Audio Visual Aids
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
University Name	Kerala Agricultural University, Thrissur

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8.1 Objectives of the Lesson

- To get acquainted with the various types of communication
- To explain the advantages and limitation of oral and written communication
- To know about characteristics and importance of AV Aids
- To classify the various audio visual aids
- To study the characteristics and selection of AV Aids

8.2 Glossary

Downward Communication: is the information that is exchanged between a manager and a subordinate in other words from top level to low level.

Formal Communication is one which is created by management and described with the help of an organizational chart.

Horizontal Communication: Communication between employees at the same level in their own departments or other departments

Informal Communication based more on friendship, shared personal or career interests.

Non-verbal communication can be defined as communication done without speaking or writing. It involves various types of body gestures and postures.

Upward Communication: Through this type of communication employees can communicate information to their superiors

Oral or Verbal Communication: Communication done through spoken words is called verbal communication

Mass Communication is directed towards a relatively large, heterogeneous and anonymous audience.

Audio aids: The instructional device through which message can be only heard are known as audio aids

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Visual aids: The instructional device through which helps to visualise the message is known as visual aids

Audio visual aids: The instructional device through which the message can be heard and seen simultaneously

8.3 Types of communication

Types of communication may be different according to media and means adopted. Communication is the flow of messages from communicator to the receiver. The organization is concerned with flow of communication. As such, it may flow by words, letters, symbols or messages. Thus, the total communication set up is broadly classified as follows:

1. According to organizational structure and function
    a. Formal
    b. Informal
2. According to the directions of flow
    a. Downward communication
    b. Upward communications
    c. Horizontal Communication or lateral communication or cross wise Communication
3. According to way of expression
    a. Oral or verbal communication
    b. Written communication or black and white communication
    c. Non-verbal communication

4. According to ways of contact and number people, following types of communication taking place in day-to-day life situations: a)Mass Communication b)Inter personal Communication c)Group Communication d)Organizational Communication

8.3.1 According to organisational structure

a. Formal communication

When information is transmitted by virtue of one's status, placement in the organization it is termed as formal communication. It flows through officially

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prescribed route in which there are officially recognized positions. It is a two way communication. E.g.: Executive instructs his subordinates.

b. **Informal or grapevine communication**

When an informal channel is used to communicate it is termed as grapevine or informal communication. It is information communication network formed out of personal relationship, social and group relations but not out of position of line of authority, superior and Subordinate or based on organisational hierarchy. Informal communication may be conveyed by a simple glance, gesture, smile or mere silence. It is a quick vehicle for message. e.g.: rumours.

8.3.2. According to direction of flow

8.3.2.1 Down ward communication

When information comes from higher level to a lower level in the organisation structure, it is termed as downward communication. E.g. Information passes through written orders, reports, rules, Instructions, manuals, policy directives etc,

Down ward communication is needed

- ✓ To get things done
- ✓ To prepare for changes
- ✓ To discourage misinformation and suspicion
- ✓ To let the people feel the pride of being relatively well informed

Advantages of downward communication

- The juniors always accept the direct instructions from the superiors as they feel to be involved in the decisions.
- The downward communication helps in understanding the short & long terms plans of the management & so, it becomes easy to work.
- By its authoritative nature the downward communication leaves no scope for misunderstandings or rumors.
- Here, the lower workers like labourers & the juniors learn about the economic condition, the achievements, awards & the international contacts which inspire them to work properly.
- A particular responsibility can be easily allotted to the juniors in downward communication.

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- The relations between the management & the staff get improved & healthy as they can share their thoughts through downward communication

Disadvantages of downward communication

- Distortion or misunderstanding- During the downward communication as the message reaches to the last point; it gets completely distorted creating misunderstanding between the management and the employees.
- Under & Over Communication- At times the employees out of their temperament or habit add something of their own or omit something from the message resulting into under or over communication.
- Delay in work- It is very lengthy process and as the information passes form one to another channel, it takes too much time and it causes unnecessary delay in work.
- Loss of information- The information gets lost and it does not reach up to the final level.
- Built-in-resistance- In downward communication the lower employees may oppose the decisions or can't accept them heartily. They do not obey such decisions and sometimes they deliberately ignore the orders of the superiors.

8.3.2.2. Upward communication

Whenever information moves from a lower level to a higher level in the organization it is named as upward communication. Through this, executives can know the activities and progress achieved by their subordinates.

Effective upward communication makes executives aware about the wishes and aspirations of their employees.

Advantages of upward communication

1. Light atmosphere- An effective upward communication creates light atmosphere as the low level employee can initiate the communication.

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2. Sense of security- As the low level employee can initiate the communication and can get his problem solved he feels a sense of security.

3. Rapid Implementation of policies- As the company or organization invites the low level employees to initiate the communication, it ensures the speed in any work and any policy can be easily implemented as it is suggested by the employees themselves.

4. The chances of failure /loss become less- Naturally when the employees themselves can suggest new policy and system the chances of failure become less.

Disadvantages of upward communication

- The superior's superiority complex affects the communication.
- Sometimes the employees are disinterested in upward communication because of their mentality or attitude.
- Inferiority complex among the juniors also does not allow them to take part in communication.
- Sometimes the upward communication is deliberately disturbed as the managers lose temper when they don't like certain matters. So, the juniors themselves omit certain information before it reaches the superiors.
- The upward communication ignores the mediators and it creates problem in communication.
- Many a times the employees misuse the upward communication for their own interest.
- Improvement in upward communication
- The channel of the upward communication should be established after careful observation. To listen to the complaints is only a half task and to solve the complaint is quite difficult. So proper care should be taken while handling grievances.

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8.3.2.3 Horizontal communication

- It is also called as sideways, lateral, crosswise, inter scalar communication
- A communication is said to be horizontal when it takes place between two subordinates of the same superior, communication between managers etc.
- It is more informal as compared to upward and downward communication as the employees can put aside their position and can participate in communication. It is considered more effective and powerful due to equal status and equal intellectual level of the sender and receiver.

Advantages of horizontal communication

- It helps in gaining speed & efficiency.
- There are no chances of distortion during horizontal communication.
- It encourages the employees of the lower stage as they are directly involved in interaction.
- It helps in proper co-ordination among the various departments.

Disadvantages of horizontal communication

- It creates a feeling of jealousy among the superiors as they may feel that they are ignored.
- It also leads to internal chaos as seniors & juniors are considered equal in communication process and both have to participate in the communication process at the same time.

8.3.3. according to the way of expression

8.3.3.1 Verbal or oral communication

The process is a face to face conversation through oral words or words of mouth. It is the most widely practiced medium of communication. Oral

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communication implies communication through mouth. It includes individuals conversing with each other, be it direct conversation or telephonic conversation.

Speeches, presentations, discussions are all forms of oral communication. Oral communication is generally recommended when the communication matter is of temporary kind or where a direct interaction is required. Face to face communication (meetings, lectures, conferences, interviews, etc.) is significant so as to build a rapport and trust.

Advantages of Oral Communication

- There is high level of understanding and transparency in oral communication as it is interpersonal.
- There is no element of rigidity in oral communication. There is flexibility for allowing changes in the decisions previously taken.
- The feedback is spontaneous in case of oral communication. Thus, decisions can be made quickly without any delay.
- Oral communication is not only time saving, but it also saves upon money and efforts.
- Oral communication is best in case of problem resolution. The conflicts, disputes and many issues/differences can be put to an end by talking them over.
- Oral communication is an essential for teamwork and group energy.
- Oral communication promotes a receptive and encouraging morale among organizational employees.
- Oral communication can be best used to transfer private and confidential information/matter.

Disadvantages/Limitations of Oral Communication

- Relying only on oral communication may not be sufficient as business communication is formal and very organized.
- Oral communication is less authentic than written communication as they are informal and not as organized as written communication.

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- Oral communication is time-saving as far as daily interactions are concerned, but in case of meetings, long speeches consume lot of time and are unproductive at times.
- Oral communications are not easy to maintain and thus they are unsteady.
- There may be misunderstandings as the information is not complete and may lack essentials.
- It requires attentiveness and great receptivity on part of the receivers/audience.
- Oral communication (such as speeches) is not frequently used as legal records except in investigation work.

8.3.3.2 Written communication

The process involves sending message by written words. Media for written communication are letters, circulars, notes, explanation and memorandum. Written communication has great significance in today's business world. It is an innovative activity of the mind.

Advantages of Written Communication

- Written communication helps in laying down apparent principles, policies and rules for running of an organization.
- It is a permanent means of communication. Thus, it is useful where record maintenance is required.
- It assists in proper delegation of responsibilities. While in case of oral communication, it is impossible to fix and delegate responsibilities on the grounds of speech as it can be taken back by the speaker or he may refuse to acknowledge.
- Written communication is more precise and explicit.
- Effective written communication develops and enhances an organization's image. It provides ready records and references.
- Legal defenses can depend upon written communication as it provides valid records.

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Disadvantages of Written Communication

- Written communication does not save upon the costs. It costs huge in terms of stationery and the manpower employed in writing/typing and delivering letters.
- Also, if the receivers of the written message are separated by distance and if they need to clear their doubts, the response is not spontaneous.
- Written communication is time-consuming as the feedback is not immediate. The encoding and sending of message takes time.
- Effective written communication requires great skills and competencies in language and vocabulary use. Poor writing skills and quality have a negative impact on organization's reputation.
- Too much paper work and e-mails burden is involved.

8.3.3.3 Non-verbal communication

It is communication of feelings, emotions, attitudes, and thoughts through body movements / gestures / eye contact, etc Non-verbal communication is the process of communicating through sending and receiving wordless messages.

Such messages can be communicated through gesture, body language or posture; facial expression and eye contact, object communication such as clothing, hairstyles or even architecture, or symbols and info graphics as well as through an aggregate of the above, such as behavioural communication. Nonverbal communication plays a key role in every person's day to day life, from employment to romantic engagements. Speech may also contain non-verbal elements known as paralanguage, including voice quality, emotion and speaking style, as well as prosodic features such as rhythm, intonation and stress.

Likewise, written texts have non-verbal elements such as handwriting style, spatial arrangement of words, or the use of emotions.

Communicating a message without using arbitrary symbols i.e., words or meaning of words is termed as 'non-verbal communication or word-less

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communication. Non – verbal messages consists of hidden messages. It is the cues which convey message.

These messages are necessarily wordless or non-verbal, conveyed through without resorting to words or meaning of words, but conveyed through other media like spatial, Kinesics, oral cues, objective language, action etc., Kinesics is the most generally used medium of non-verbal communication

8.3.4. According to ways of contact and number people

8.3.4.1 Mass Communication

Mass Communication is directed towards a relatively large, heterogeneous and anonymous audience. The specific features of this are:

The message is addressed 'to whom it may concern' (from Communicator's point of view);

Rapid in nature: Since the messages are meant to reach a large audience within a relatively short time, or even simultaneously. It is often timed to reach most audience-members, at the same time;

Transient in nature (an old concept), especially vis-a-vis live recordings/coverages**:** Since messages are usually intended to be consumed immediately; exception(s):- Cassettes Film/Radio Recording, Photographs, etc. (However, the recorded versions of the concerned messages may be utilized, as and when required!)

The individual member of the audience generally remains personally unknown to the communicator; moreover, the target-audience may even be physically separated in terms of space;

- Lack of Direct Interaction between the source and receiver;
- Only one Source, at one point of time, is disseminating the message;
- Lack of instant feedback from the audience;
- More Coverage of Area is possible;

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- More (perceived) credibility in the eyes of the audience.

8.3.4.1.1Mass Contact Methods

a) Campaigns

Campaign is an intensive teaching activity undertaken at an appropriate time, for a brief period, focusing attention in a concentrated manner on a particular problem, so as to stimulate the widest possible interest in the community. However, it cannot be organized for all kinds of improved practices.

b) Exhibitions

A systematic display of models, specimens, charts, posters, etc. in a sequence, so as to convey some significant information or idea in an easily understandable way to the onlookers.

c) Circular Letters

Specially prepared intimate letters, using a personal approach for a specific message, which are mailed to a large number of farmers either periodically or on special occasions.

d) Extension Publications

- Leaflet and folder- provide specific information on nay topic
- Pamphlet (may contain information on a numbers of related topics)
- Farm Radio Programmes/ Broadcasts
- T.V.
- Documentary Film Shows
- Farmers Fairs/ Kisan Mela

8.3.4.2 Interpersonal Communication

In this type of communication, each individual (involved) functions both as a source as well as receiver of message(s). It may be: Between 2 persons,

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Between several persons, Between Persons to Group Communication (i.e. the public speaking)

8.3.4. Types of Interpersonal Communication

8.3.4.1 Personal Localité Sources/ Channels (e.g. family members, relatives, neighbours, local progressive farmers and Interpersonal communication other farmers within the same social setting/ locality)

8.3.4.2 Personal Cosmopolite Sources/ Channels (e.g. Subject Matter Specialists (SMS) working in KVK, University Scientists, Local School teachers, Officials/ Personnel associated with Banks, Co-operative societies, State Agricultural/ Animal Husbandry/ Dairy departments, Non-Governmental Organization (NGO), etc.

8.3.4.3 Individual Contact Methods

- Farm & Home Visits (i.e. door-to-door type of visit)
- Personal Letters/E-mail/Facsimile(FAX)/Telegram
- Farmers (individual) call being attended by Ext. worker.
- Telephone: Landline & Mobile
- Advisory/ Consultancy Letters/Services

8.3.4.4 Group Communication

It possesses at least 3 characteristics common to Interpersonal Communication, viz:

- Face-to-face in nature.
- Communication is discontinuous discourse; i.e. people speak alternately, which means that all the members of the group are both source as well as receiver.
- Probability of Influence of one person upon another.

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In Group Communication, it is possible for an individual member to determine the needs of the other members of the group and to adapt to them to that effect, more easily.

8.3.4.1 Group Contact Methods

- Lectures
- Group Discussions / Group Meetings
- Conduct Farm / Field Tours
- Method Demonstrations
- Result Demonstrations
- Quizzes
- Questionnaire
- Seminar / Symposium / Conference, etc.

8.3.5 Organisationl Communication

Communication is the life and blood of any organization and it occupies a strategic place in development / administration. Performance of any Organization (Administration) can be adjudged on the basis of effectiveness and efficiency of its communication system.

Classification of Organization / Administrative Communication (on the basis of function; as given by Thayer, 1961):-

a) Informative communication (e.g. circular)

b) Instructive communication (e.g. memo)

c) Evaluative communication (e.g. confidential report)

d) Persuasive communication (e.g. explanation)

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8.4 Extension teaching methods

Extension teaching methods may be defined as the devices used to create situation in which meaningful communication can take place between the instructor and the learners.

8.4.1 Meaning and Definition of Extension teaching methods

A method is a way of doing something, an orderly arrangement of a set of procedures. Thus, it involves a sequence of progressive steps in an orderly and logical regularity in order to accomplish some task or purpose. An extension teaching method may, then, be defined as a sequence of progressive steps, undertaken to create situations that are conducive to effective learning.

According to Leagans (1961) extension teaching methods/ communication methods are the devices used to create situations in which communication can take place between an instructor and the learner.

An Ensminger (1957) said, before an extension worker can become efficient in the use of methods, he must know what methods are available, when to use a given method, and become effective in using each.

8.4.2 Functions of Extension teaching methods

The following are the functions of extension teaching methods:

1. To provide communication so that the learner may see, hear and do the things to be learnt.

2. To provide stimulation that causes the desired mental and or physical action on the part of the learner.

3. To take the learner through one or more steps of teaching – learning process, viz. Attention, interest, desire, conviction, action and satisfaction.

8.4.3 Classification of Extension teaching methods

Wilson and Gallup (1955) classified extension teaching methods according to their use and form.

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Individual contact: Individual contact is a direct, face to face contact by an extension worker with farmer individuality for a specific purpose, in his office or on the farm or at home.

Group contact: Those extension teaching methods through which it is possible to interact with a single exposure or source for the purpose of effecting behavioural changes are called group contact methods.

Mass contact: Mass contact methods refer to those which enable development agents or agencies to reach a large number of persons, directly or indirectly with one exposure or a single source.

8.5 Meaning of Audio-Visual Aids

Audio- visual aids are instructional devices which are used to communicate messages more effectively through sound and visuals.

Audio-visual aids help in stimulating the sensory organs like ears and eyes and facilitate quick comprehension of the message by the audience. These may be used for literate as well as for illiterate people.

Meaning of audio

Audio means what we hear. The five senses audio, visual, touch, smell and taste plays an important role in communicating message. Hearing plays an important role in receiving and sending a message effectively. The most basic form of communication is oral and face to face contact. Hearing plays an important role in oral-face to face communication.

In recent days due to the invention of modern gadgets like radio, tape recorder, public address system telephones and mobile phones the type of communication is more of an indirect type as the individuals do not face each other. People in such situations communicate without coming into close proximity.

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Meaning of audio aids

Audio Aids are the instructional devices through which the message can only be heard. In other words, An audio aid is an instructional device in which the message can be heard but not seen.

Meaning of visual

A visual is what can be seen.

Visual helps one to communicate more effectively. Out of the five physical senses through which we learn, the eye is the most helpful in learning. Words are not enough for communicating an idea. The same word may even mean different things to different people. We speak different languages and so, many times communication becomes difficult.

Meaning of visual aids

Visual Aids are the instructional devices which help to visualize the message. In other words, A visual aid is an instructional or communicating device in which the message can be seen but not heard.

Meaning of audio-visual

Audio-visual means the things which we hear as well see.

Meaning of Audio-visual aids

Audio-visual aids or devices or technological media or learning devices are added devices that help the teacher to clarify, establish, co-relate and co-ordinate accurate concepts, interpretations and appreciations and enable the learner to make learning more concrete, effective, interesting, inspirational, meaningful and vivid. In other words

Audio-visual aids are used to improve teaching, i.e. to increase the concreteness, clarity and effectiveness of the ideas and skills being transferred. They enable the audience to Look, Listen and learn (by doing); to learn faster, to learn more, to learn thoroughly and to remember longer.

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According to an old Chinese proverb the importance of audio-visual aids is indicated by the saying that "if I hear I forget, if I see I remember, if I do I know."

The audio-visual aids help in completing the triangular process of learning, motivation, clarification-stimulation.

The aim of teaching with technological media is clearing the channel between the learner and the things that are worth learning. The basic assumption underlying Audio-Visual Aids is that learning and clear understanding-stems from sense of experience. The teacher must 'show' as well as 'tell'.

Audio –Visual aids provide significant gains in informational learning, retention, recall, thinking, reasoning, activity, interest, imagination, better assimilation, personal growth and development.

8.6 Definitions of Audio-Visual aids

The instructional devices through which the message can be heard and seen simultaneously are known as Audio-Visual Aids

According to Burton: Audio-Visual aids are those aids which help in completing the triangular process of learning i.e., motivation, classification and stimulation

According to Edgar Dale: Audio-Visual are those devices by the use of which communication of ideas between persons and groups in various teaching and training situations is helped. These are also termed as multi-sensory materials

Good's Dictionary of Education: Audio-Visual aids are anything by means of which learning process may be encouraged or carried on through the sense of hearing or sense of sight

According to Kinder; S. James: Audio-Visual aids are any device which can be used to make the learning experience more concrete, more realistic and more dynamic

According to Mcknown and Roberts: Audio-Visual aids are supplementary devices by which the teacher; through the utilization of more than one sensory

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channel is able to clarify, establish and correlate concepts, interpretations and appreciations.

Audio-visual aids are also known as Teaching aids, Educational Communication Technology, Audio—Visual Media, Learning Resources and Instructional or Educational Media.

8.7 Importance or Functions of Audio-Visual Aids

1. Best motivators: audio-visual aids are the best motivators. The students work with more interest and zeal. They are more attentive

2. Antidote to the disease of verbal instruction: They help to reduce verbalism. They help to giving clear concepts and thus help to bring accuracy in learning

3. Clear images: clear images are formed when we see, hear, touch, taste and smell as our experiences are direct, concrete and more or less permanent. Learning through the senses becomes the most natural and consequently the easiest.

4. Vicarious experience: It is beyond doubt that the first-hand experience is the best type of educative experience. But it is neither practicable nor desirable to provide such experience to pupils. Substituted experiences may be provided under such conditions

5. Variety: Audio-Visual aids given variety and provide different tools in the hands of the teacher

6. Freedom: When audio-visual aids are employed, there is great scope for children to move about, talk, laugh and comment upon. Under such an atmosphere the students work because they want to work and not because the teacher wants them to work

7. Opportunities to handle and manipulate: Many visual aids offer opportunities to students and manipulate things

8. Retentivity: Audio-Visual aids contribute to increases Retentivity as they stimulate response of the whole organism to the situation in which learning takes place

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9. Based on maxims of teaching: The use of audio visual aids enable the teacher to follow the maxims of teaching like concrete to abstract, known to unknown and learning by doing

10. Helpful in attracting attention: Attention is the true factor in any process of teaching and learning. Audio-Visual aids help the teacher in providing proper environment for capturing as well as sustaining the attention and interest of the students in the classroom work

11. Helpful in fixing up new learning: What is gained in terms of learning, needs to be fixed up in the minds of students. Audio –Visual aids help in achieving this objective by providing several activities, experiences and stimuli to the learners

12. Saving of energy and time: A good deal of energy and time of both the teachers and students can be saved on account of the use of audio-visual aids as most of the concepts and phenomena may be easily clarified, understood and assimilated through their use

13. Realism: the use of audio-visual aids provides a touch of reality to the learning situation.

14. Vividness: Audio-visual aids give vividness to the learning situation.

15. Meeting individual differences: There are wide individual differences among learners. Some are ear-oriented; some can be helped through visual demonstrations, while others learn better by doing. The use of a variety of audio-visual aids helps in meeting the needs of different types of students.

16. Encouragement to healthy classroom interaction: Audio-visual aids, through their wide variety of stimuli, provision of active participation of the students, and various experiences encourage healthy classroom interaction for the effective realization of teaching –learning objectives

17. Spread of education on a mass scale: Audio-visual aids like radio and television help in providing opportunities for education to people living in remote areas.

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18. Promotion of scientific temper: in place of listening to facts, students observe demonstrations and phenomena thus cultivate scientific temper

19. Dale has listed the following importance of using audio-visual aids

- Reduces the time lag
- Make learning permanent
- Add interest and involvement
- Stimulate self activity
- Provide direct interest
- Develop continuity of thought.
- Develop meaningful vocabulary
- Enlarge the range of possible experience
- Teach efficiently
- Add highly useful variety
- Improve the effectiveness of other materials.
- Multiply messages.

8.7 Problems in the Use of Audio-Visual Aids

1. Apathy of the teachers: Teaching with words alone is very tedious, wasteful and ineffective

2. Indifference of participants: the judicious use of aids arouses interest but when used without a definite purpose they lose their significance and importance

3. Ineffectiveness of the aids: Due to the absence of proper planning and lethargy of the teacher and without proper preparation, correct presentation, appropriate application and discussion and the essential follow-up work, the aids do not prove their full usefulness.

4. Financial hurdles: AV aids are generally costlier affair

5. Absence of electricity: Most of the projectors, Radio and TV cannot work without the electric current which is not available in the village or block

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6. Lack of facilities for training: Training colleges or specialized agencies should make special provision to train teachers and extension workers in the use of these aids

7. Language difficulty: Most educational literature are in English. Extension workers should have in local language

8. Not catering to local needs: Little attention is paid in the production of audio-visual aids to the local sociological, psychological and pedagogical factors

9. Improper selection of AV aids: AV aids are not selected according to the classroom or learner needs

8.8 Classification of Audio visual Aids

1. Audio aids: The instructional device through which message can be only heard are known as audio aids. Examples: Tape recorder, radio and telephone

2. Visual aids: The instructional device through which helps to visualise the message is known as visual aids

a. Projected visual aids: examples- slides, Over head projector, power point slides

b. Non projected visual aids: examples-Poster, charts, graphs, models, specimens, chalkboards, picture and photographs

c. Display type: Visuals are those which are spread before the audience for viewing, who get the message by looking at them. Examples; Poster, models, exhibits and specimens

d. Presentation type: Visuals are those presented or projected before the audience for viewing but at the same time, one explains or presents the message of the visuals. So that the message gets a meaningful understanding of them. Example; Slides, Over head projectors, charts and power point slides

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3. Audio visual aids: The instructional device through which the message can be heard and seen simultaneously are known as audio aids

a. Projected Audio visual aids: examples; Video and cinema

b. Non project Audio visual aids: examples; Drama, Puppet show and street play

Audio-visual aids may be classified into three categories as follows:

Table 8.1: Classification of AV aids

Audio Aids	**Visual Aids**		**Audio Visual Aids**	
	Non – Projected	**Projected**	**Non-Projected**	**Projected**
Tape recorder	Chalk board	Slides	Drama	Motion pictures
PAS	Bulletin board	Film strips	Puppet show	Video
Telephone	Picture and photographs	Opaque projector	Extension talk	Computer aided instructions
Tele conferencing	Flannel graph	Overhead projector	Simulations	Video conferencing
	Charts, posters, diagram, maps, specimen and models.	Computer conferencing		

Another way of classifying the audio-visual aids

Display type: Display Type visuals are those which are spread before the audience for viewing who get the message by looking at them.

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Examples: Poster, bulletin board, models, exhibits etc.

Presentation Type: Presentation Type visuals are presented or projected before the audience for viewing, but at the same time one explains or presents the message of the visuals, so that the audience gets a meaningful understanding of them.

8.8.1 Projected Visual Aids

Extension educator needs to know some basic things about the projection equipments since simple adjustments will often yield greatly improved pictures on the screens or improvements in the sound. Projected aids help for the effective transfer of the message from one source to another. However, the extension educator relates the effectiveness to the appropriate selection of the equipment.

The principle involved in projection is that "when light falls on a transparent or translucent or opaque object, it passes through the object or is reflected by it; then if it is made to pass through a convex lens and allowed to fall on a screen at a convenient distance, an inverted image of the object will appear on the screen". If the object is initially kept inverted before the source of light, the image will be straight and comprehensible. There are three major projection systems:

1. Direct projection

Direct projection is the most commonly used system. By this method, the light is passed directly from the projection bulb through the objective lens on to the screen. A minimum light is lost in this method. The most commonly used direct projection equipments are slide projector, 8 mm/ 16 mm/ 35 mm motion picture projectors.

2. Indirect projection system

With an indirect light source and using mirrors, the projector can be used in front of the room. The materials being projected are placed on a flat platform above the light source. Although in some instances, there is a loss in the

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amount of light passing through an indirect projection system, as compared with direct system, the loss is negligible. The overhead projector works on this system of projection.

3. Reflected/Opaque projection system

Projection by reflection is used in the opaque projector. Materials which are flat or semi-flat materials can be used here. Opaque materials such as pictures, book pages, and objects can be projected. In the opaque projector, condenser lens are not used to spread the light evenly over the object being projected, instead a series of mirror surround the platen of the projector.

The mirror reflects all possible light onto the object. The image is reflected in a large mirror placed immediately above the object through a large objective lens to the projection screen. The reflected system absorbs great deal of light, making it mandatory to use the opaque projector in a darkened room for the most satisfactory projection.

Non-projected Visual-Aids

The following are the more commonly used non-projected visual in extension teaching Charts, graphs, Posters, Flannel-graphs, Flash cards, Puppets, Models, Bulletin boards, Photographs, Black-boards

Table 8.2: Classification of projected aids

Projected Aids	**Non-Projected Aids**				
	Graphic Aids	**Display Boards**	**3-Dimensional Aids**	**Audio Aids**	**Activity Aids**
Films Film-strips Opaque projector	Cartoons Charts Comics Diagrams Flash cards	Blackboard Bulletin Flannel Board	Diagram Models Mockups Objects Puppets	Radio Recordings Television	Computer-Assisted Instruction Demonstrations Experimentation

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Overhead projector slides	Graphs Maps Photographs Pictures Posters	Magnetic Board Peg board	Specimens		Field Trips Programmed Instruction Teaching Machines

8.9 Selection of Audio visual aids

8.9.1 Characteristics of Good Audio-Visual Aids (Teaching aids)

- They should be meaningful and purposeful
- They should be accurate in every respect
- They should be simple
- They should be cheap
- As for as possible, they should be improvised
- They should be large enough to be properly seen by the students for whom they are meant
- They should be up to date
- They should be easily portable
- They should be according to the mental level of the students
- They should motivate the learners

8.9.2 Factors influencing in selection of Audio-Visual Aids

Audio-visual aids are used singly or in combination, taking the following factors into consideration

1. The teaching objective: i.e. the type of behaviour change you want to bring about like gaining information or changing attitude or learning some skill.

2. The nature of the subject matter being taught

3. The nature of audience: like age level, educational level, interest, experience, knowledge of the subject, intelligence

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4. The nature of audience: eg., Flash card can be used for a small audience only but, motion picture can be used for a large audience

5. Relative cost of the various aids: Effective aids need not necessarily be expensive

Relative cost of the various aids The teacher's familiarity with and skill in using the several aids

Teacher originality and skill in selection, preparation and use of aids

6. The availability: the teacher should make use of indigenous materials, when the teaching aid she/he would like to use is not available

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Course Name	Fundamentals of Extension Education
Lesson 9	Adoption and Diffusion Process: Concept, Steps, Characteristics
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
University Name	Kerala Agricultural University, Thrissur

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9.1 Objectives of the Lesson

- To explore the meaning, concept of diffusion, adoption and innovation
- To discuss the various attributes of innovation
- To understand the adoption process and adopter categories
- To determine the factors influencing the adoption and diffusion process
- To know the concepts related to adoption and diffusion process

9.2 Glossary

Innovation: It is an idea, practice or object that is perceived as new by an individual or other unit of adoption.

Adoption: It is a decision to make full use of an innovation as a best course of action available.

Adoption Process: It is the mental process through which an individual pass from hearing about an innovation to final adoption".

Diffusion: It is a process by which an innovation is communicated through certain channels over time among the members of the social system.

Decision making: It is a process comprising a sequence of stages with a distinct type of activity occurring during each stage

Rejection: It is a decision not to adopt an innovation

Innovativeness: It is the degree to which an individual is relatively earlier in adopting new ideas than other members of a system.

Rate of adoption: It is the relative speed with which an innovation is adopted by members of a social system

9.3 Meaning and Concept of Diffusion, Adoption and Innovation

The most significant and integral part of extension is the diffusion of innovation and adoption of new idea, practice, techniques, varieties of crops etc among the farmers in a social system. Thus understanding of the key

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concept, characteristics and process of diffusion and adoption is essential to enhance the effectiveness of extension system

An extension worker's job does not end with merely informing the farmers about improved practices, he should ensure practical application (by the farmers) of the result of research and field trials.

9.3.1 Concept of Diffusion and its elements

Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system.

It is a process by which innovations are spread to the members of social system. In this process new ideas are spread from its source of invention or creation to its ultimate users or adopters. Diffusion is a special type of communication. It is concern with new ideas or messages, whereas communication includes all type of message or ideas.

Diffusion Process: Diffusion process is the spread of a new idea from its source of invention or creation to its ultimate users or adopters". These definitions indicate that "diffusion is a process related to adoption of an innovation in an entire social system such as a village or block etc., while adoption is a sequence of thoughts and actions which an individual goes through, before he finally adopts a new idea".

It is the newness of the idea in the message content of communication that adds diffusion its special trait and importance.

9.3.1.1Elements in the diffusion of innovations:

The four main elements in diffusion of innovations are

1. Innovation
2. Communication channels
3. Time
4. Social system.

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Innovation:

An innovation is an idea, practice or object that is perceived as new by an individual or other unit of adoption. It may be new variety fruit or vegetables crops, new farming practices, breed of fish, new chemicals or medicines, new techniques of doing things etc. Sometimes farmers also develop new practice which is also considered as an innovation.

Newness of an innovation may be expressed in terms of knowledge, persuasion or a decision to adopt. The technologies, practices developed through research are innovations. Irrespective of the time period the idea or practice was originally developed, when a person first becomes aware of it, it is an innovation to that person

Communication channels:

A communication channel is the means by which messages get from one individual to another. The following classification of channels would help the communicator to use them appropriately:

i) Interpersonal channels - It refers to those which are used for face to face communication between two or more individuals.

ii) Mass media channels - These enable the messages to reach a larger, diverse audience simultaneously in a relatively shorter time. e.g.: Radio and T.V.

iii) Localite channels - They originate within the social system of the receiver. eg: neighbours, relatives, opinion leaders etc.

iv) Cosmopolite channels - They originate outside a particular social system. eg: Extension worker, sales personnel etc.

Time:

It is the time period in which an innovation takes its own pace to spread. It may be faster or moderate or slower based on the innovation's importance. Time does not exist independently of events, but it is an aspect of every activity. The time dimension is involved in diffusion in the innovation - decision process, in

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the innovativeness of an individual or other unit of adoption and innovation's rate of adoption in a system.

Social System:

It is defined as a set of interrelated units that are engaged in joint problem solving to accomplish a common goal. The members or units of a social system may be individuals, informal groups, organizations and / or subsystems. The social system constitutes a boundary within which an innovation diffuses.

Concept of Adoption:

Adoption is a decision to make full use of an innovation as the best course of action available.

Adoption Process: According to Rogers, "adoption process is the mental process through which an individual passes from hearing about an innovation to final adoption". Adoption process occurs at individual level. Adoption is the use of new idea continuously on a full scale.

Adoption is essentially a decision making process which may be divided into a sequence of stages with a distinct type of activity occurring during each stage. Adoption process is the way in which individual adopts an innovation that is a series of related events in a time sequence.

A major difference between the diffusion process and the adoption process is that diffusion occurs among persons while adoption is an individual matter.

9.4 Perceived Attributes of Innovation

An innovation has some extrinsic and intrinsic qualities or characteristics. Attributes are qualities, characteristics or traits possessed by an object. The visible quality or character of the innovation not the intrinsic quality is more important for extension. Perception is an activity through which an individual becomes aware of objects around oneself and of events taking place. The perceived attributes of innovations which are basic to extension are as follows.

9.4.1. Relative advantage: it is the degree to which an innovation is perceived as being better than the idea it supersedes. The relative advantage may have

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a number of dimensions. For example, if a new technology or practice gives more yield or income' or saves time, labour and cost; or has less risk than the existing one; it has more relative advantage.

Multiple use of an innovation may be a form of relative advantage. For example, an equipment or material which may be used for a number of activities has more advantage than an equipment or material which can be used for a single purpose. The advantage of location for specific enterprises in specific areas may provide some relative advantage. The innovations which have more relative advantage are likely to be adopted quickly.

9.4.2. Compatibility: it is the degree to which an innovation is perceived as consistent with the existing values, past experiences and needs of potential adopters. Compatibility has at least two dimensions– situational compatibility and cultural compatibility. When a new crop variety such as vegetable, fruit, plantation crops etc suits the agro-climatic condition of the farmer, it indicates situational compatibility.

When a breed of livestock advocated to the farmer is in agreement with their beliefs and values, it is cultural compatibility. The name given to an innovation may affect its compatibility. Compatibility of an innovation is essential for its adoption.

9.4.3. Complexity: is the degree to which an innovation is perceived as relatively difficult to understand and use. An innovation should, as far as possible, be less complex for the farmers to understand and use. However, complexity of an innovation may not deter its adoption, provided it has more relative advantage.

For example, many of the high yielding technologies like HYV crops, precision farming, nano technology, crossbred cattle, composite fish culture etc., are quite complex. Still, their diffusion has been quite high, which may be due to their high relative advantage in terms of more yield and income and shorter gestation period.

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Complex technologies often require complementary adoption. For example, adoption of high yielding technologies requires adoption of balanced nutrition practices, appropriate protection technology and better management methods, to get the best results. Complex technologies, because of their complicated and intricate nature, require consistent training and communication support for the clientele, for their adoption and continued use.

9.4.4. Trialability: is the degree to which an innovation may be experimented with on a limited basis. Adoption of new seeds and fertilizers are more, compared to new farm machinery, simply because seeds and fertilizers may be purchased in small units and tried, whereas, purchase of farm machinery, requires large investment and cannot be tried in parts. The minikit demonstrations have helped in spreading the cultivation of high yielding variety crops as this method involves small scale trial by the farmers. Earlier adopters appear to be more concerned about the trialability of an innovation than later adopters.

9.4. 5. Observability: is the degree to which the results of an innovation are visible to others. The visible impact of an innovation facilitates its diffusion in the social system. For example, application of balanced fertilizer in crop plants has almost always been recommended to the farmers. In practice, farmers generally use more of nitrogenous fertilizers. It is because, the effect of nitrogenous fertilizer is very obvious in the eyes of the farmers – the plants "jump" the leaves turn green, whereas, the effects of phosphatic and potassic fertilizers are not so evident.

Preventive innovations in disease control are generally less costly than the curative innovations, but the results of preventive innovations are not so obvious, compared to those of the curative innovations. That is why technologies like treatment of seeds; preventive vaccinations etc. have been less adopted.

Treatment of potato seed has, however, very high rate of diffusion, because preventing disease in this high investment crop brings higher return, i.e., has high relative advantage.

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9.4.6. Predictability has also been perceived as an attribute of innovations (Napier, 1991).

Predictability refers to the degree of certainty of receiving expected benefits from the adoption of an innovation. Subsistence farmers are often very cautious while making adoption decisions, because crop failure or substantial reduction in output due to failure of agricultural innovations to achieve expected production goals, can result in loss of meager landholdings and starvation of the family. Under such conditions farmers are reluctant to adopt any technology or technique which introduces a higher level of uncertainty into the operation of the farm enterprise.

It may be generalized that the attributes - relative advantage, compatibility, trialability, observability and predictability of an innovation, as perceived by the members of a social system are positively related to its rate of adoption. The complexity of an innovation, as perceived by the members of a social system, is negatively related to its rate of adoption.

9.5 Models of Adoption Process

An innovation diffuses within a social system through its adoption by individuals and groups. The decision to adopt an innovation, however, it is not normally a individual, instantaneous immediate act, it involves a process. The adoption process is a decision-making process goes through a number of mental stages before making a final decision to full scale adopt an innovation.

Ryan and Gross (1943) probably first drew attention to the existence of a sequence of stages in the process of adoption by farmers (i) “awareness” of the existence of an innovation (ii) “conviction” of its usefulness, (iii) “acceptance” in the sense of willingness to try the innovation which is followed by its (iv) “complete adoption”.

Wilkening (1953) also proposed four interrelated stages of adoption of innovation as a process composed of learning, deciding and acting over a period of time. The adoption of a specific practice is not the result of a single decision to act but series of actions and thought decisions. He identified four

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adoption stages namely, awareness, obtaining information, conviction, trial and adoption.

According to Johnson and Haver (1955), adoption is essentially as decision – making process involves the following steps.

(i) Observing the problems

(ii) Making analysis of it

(iii) Deciding the available courses of action

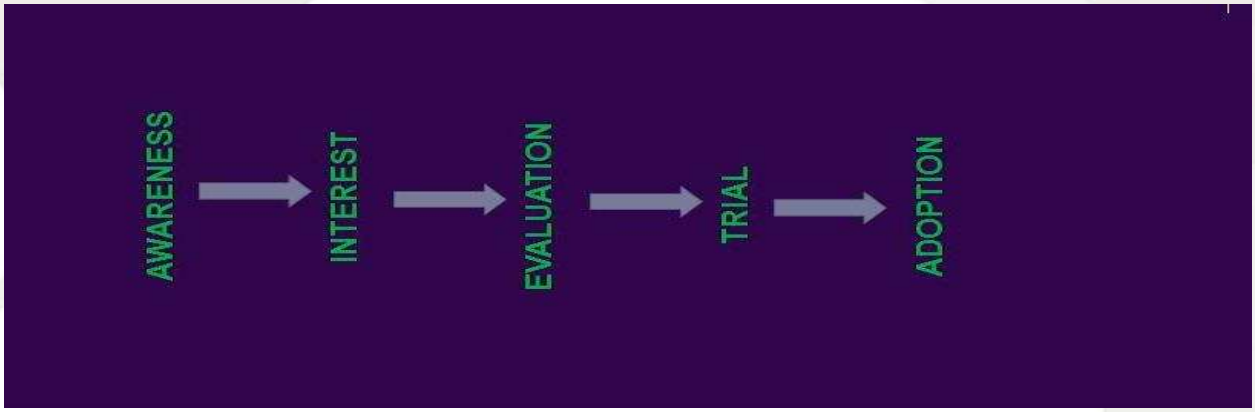
(iv)Taking one course

(v) Accepting the consequence of the decision

9.5.1 AITEA model of adoption process

The North Central Rural Sociology Subcommittee for the study of Diffusion of Farm Practices (1955) identified 5 stages of the adoption process, which received worldwide attention. They are 1) Awareness 2) Interest 3) Evaluation 4) Trial and 5) Adoption.

Fig 9.1 Five stage adoption process



1. Awareness: At this stage an individual becomes aware of some new idea such as banana hybrid or new insecticide. He knows about the existence of the new idea but he lacks details about it. For instance, he may know only the name and may not know what the idea or product is what it will do or how it will work. For instance, the farmers may know SSI cultivation in Sugarcane only the name and may not know what (SSI) is, what it will do and how it will work.

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2. Interest: At the interest stage, a person wants more information about the idea or product. He wants to know what it is, how it works and what its potentialities are. He may say to himself that this might help him increase his income, or help him control insects or diseases or improve farming or home life in some other way. For instance, he may inquire about the new varieties, new techniques it production potential, productivity etc.

3. Evaluation: At this stage, the individual makes mental application of the new idea to the present and anticipated future situations and decides whether or not to try it. He applies the information obtained in the previous stages to his own situation.

At this stage, the individual judges the worth of the innovation. The person makes an assessment whether the idea is applicable to own situation, and if applied what would be the result. He asks himself "can I do it? And if I do it, will it be better than I am doing now; will it increase my income or otherwise bring me satisfaction?"

For instance, the farmer after hearing to SRI (System of sugarcane Intensification)cultivation in sugarcane and acquiring more information at the interest stage what are the components and how they improve yield and save water, he/she mentally judge whether SSI cultivation improves yields if adopted.

4. Trial: The individual actually applies the new idea on a small scale in order to determine its utility in own situation. If he decides that the idea has possibilities for him he will try it. The trial stage is characterized by small-scale experimental use, and by the need for specific information which deals with: "How do I do it; how much I do I use; when do I do it; how can I make it work best for me?"

Trial may be considered as the practical evaluation of the innovation. It provides evidence of the advantages of the innovation. Individuals need to test a new idea even though they have thought about it for a long time and gathered information concerning it before large scale adoption

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5. Adoption: This final stage in the process is characterized by large scale, continued use of the idea, and most of all, by satisfaction with the idea. Trial may be considered as the practical evaluation of an innovation. It provides evidence of advantages of the innovation. Being satisfied with the trial and considering the pros and cons of the situation, the individual takes final decision and applies the innovation in a scale appropriate to own situation on a continued basis.

These five stages are not necessarily a rigid pattern which people follow. These stages are influenced by cultural differences and social factors as well as by the kind of practice, place and person. At any stage the recommendation can be rejected or discontinued. There can be jumping from one stage to another. If the farmers have confidence in the extension personnel, and his recommendations, they may jump form “evaluation” to “adoption” stage.

(ii) Further, it should be remembered although there is general consensus on the existence of stages and that adoption is seldom an impulse decision.

9.5.2 Seven stage model of adoption process

There is no complete agreement as to the number of stages in the adoption process as it is a mental process and decision making process. According to Singh (1965), the stages of adoption are dynamic and not static. The sequence is not always the same. Sometimes one stage appears more than once. The same five stages do not occur with all the adopters and all the practices. Singh and Pareek (1960) have developed a seven stage model of the adoption process.

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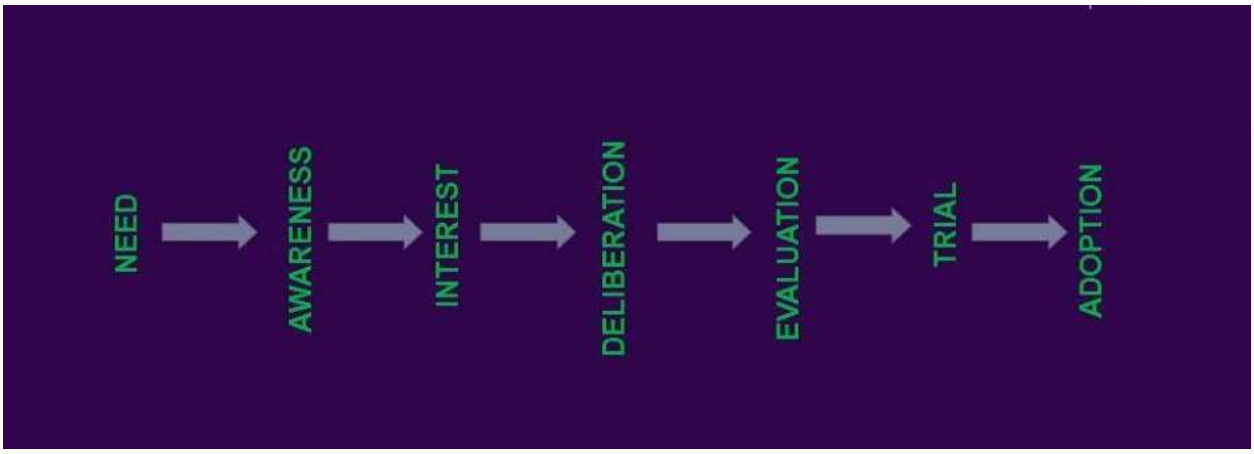
Fig 9.2 Five stage adoption process



1. Need: This is a stage when an individual wishes to change his existing practices, Express dissatisfaction and develops a compromise.

2. Awareness: The individual just comes to know about an innovation without knowing the details of it.

3. Interest: He makes an attempt to know more about the innovation. Asks extension agents / friends and seeks information and sees the innovation.

4. Deliberation: This is a stage of deliberation and mental evaluation. The individual mentally examines the possibility of application of the innovation under own condition. He seeks advice of opinion leaders, observes the performance at different places and discusses with family members. The individual then takes a decision to try out or reject the idea.

5. Trial: An individual uses an innovation in part or sometimes in full. The individual applies the practice on a limited scale to observe the performance under own conditions.

6. Evaluation: The individual evaluates the performance of the innovation. The individual observes the performance of an innovation on various dimensions. Collect data on the performance of an innovation on others' situations. Compare the performance of the new with the old one and find out changes which will be necessary if innovation is to be adopted. Calculate input- output, risks, uncertainties, profitability, predictability of innovation etc.

7. Adoption: It is a decision to use the practices on continued basis.

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9.5.3 Innovation Decision Process

Rogers & Shoemaker have used the term Innovation – Decision Process in preference to Adoption process.

According to Rogers (1983,1995) the innovation – decision process is the process through which an individual passes from first knowledge of an innovation, to forming an attitude towards the innovation, to a decision to adopt or reject, to implementation and use of the new idea, and to confirmation of this decision.

This process consists of a series of actions and choices over time through which an individual or an organization evaluates a new idea and decides whether or not to incorporate the new idea into the ongoing system. This behaviour consists essentially of dealing with the uncertainty that is inherently involved in deciding about a new alternative to those previously in existence.

The perceived newness of an innovation, and the uncertainty associated with this newness, is a distinctive aspect of innovation-decision making, compared to other types of decision making. Innovation – decision is a process that occurs over time and is conceptualized to have five stages.

1. Knowledge 2. Persuasion 3. Decision 4. Implementation 5. Confirmation

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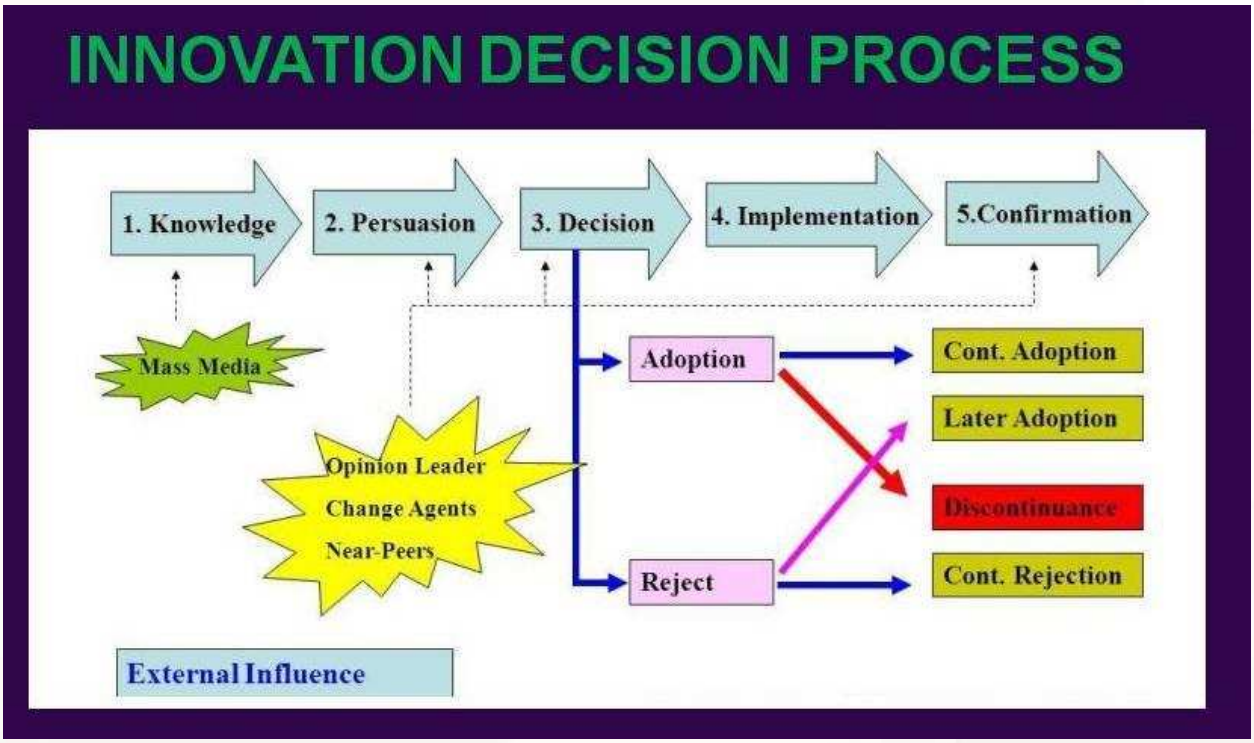
Fig 9.3 Innovation Decision process



1. Knowledge stage:

It occurs when an individual or other decision making unit is exposed to an innovation's existence and gains some understanding of how it functions. Knowledge function is mainly cognitive or knowing. Knowledge seeking is initiated by an individual and is greatly influenced by one's predispositions.

Exposure is selective and generally, individuals tend to expose themselves to those ideas which are consistent with one's existing attitudes and beliefs, and avoid those which are in conflict with them. A need can motivate an individual to seek information about an innovation and the knowledge of an innovation may develop the need.

Questions such as 'what is the innovation?' 'How does it work?' and 'Why does it work?' are the main concerns of an individual about an innovation. The first of these three types of knowledge, awareness-knowledge, is information that an innovation exists.

Awareness-knowledge then motivates an individual to seek 'how-to-knowledge and 'principles' knowledge. This type of information-seeking is

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concentrated at the knowledge stage, but it may also occur at the persuasion and decision stages.

How-to knowledge: consists of information necessary to use an innovation properly. The adopter must understand what quantity of an innovation to secure, how to use it correctly, and so on. Principles-knowledge: consists of information dealing with the functioning principles underlying how the innovation works. If a problem occurs in an individual's use of an innovation, principles knowledge may be essential in solving it.

Types of knowledge Questions answered

1. "Awareness – knowledge: What is innovation

2. "How to – knowledge: How does innovation work

3. "Principles – knowledge: Principles underlying how the innovation works (functioning principles)

2. Persuasion stage:

Persuasion occurs when an individual or some other decision making unit forms a favorable or unfavorable attitude towards the innovation. Persuasion function is mainly affective or related to feeling. At this stage, the individual becomes more psychologically involved with the innovation and actively seeks information about it. The individual perceives the attributes of innovation, which is conditioned by one's personality and social system norms, and develops a general idea about the innovation.

In developing a favorable attitude towards the innovation, an individual may mentally apply the new idea to the present or anticipated future situation before deciding whether or not to try it. There may be two levels of attitudes, a specific attitude towards the innovation, and a general attitude towards change. A previous positive experience helps the process and a previous negative experience i.e. a failure develops resistance to future new ideas.

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3. Decision stage:

Decision occurs when an individual engages in activities that lead to a choice to adopt or reject the innovation. The individual puts the innovation to a small-scale trial in own situation. Considering its relative advantage, risk involved and many other related factors like availability of market, need for the family etc., the individual decides whether to adopt or reject the innovation.

For some individuals and for some innovations, the trial of a new idea by a peer like themselves can substitute at least in part., for their own trial of an innovation. This 'trial by others' provides a kind of vicarious (realized through other's experience) trial for an individual.

Extension agents often seek to speed up the innovation-process for individuals by organizing demonstrations and field days of a new idea in a social system.

4. Implementation stage.

Implementation occurs when an individual or other decision making unit puts an innovation into use. At this stage the individual is generally concerned with where to get the innovation, how to use it and what operational problems will be faced and how these could be solved.

Implementation may involve changes in management of the enterprise and/or modification in the innovation, to suit more closely to the specific needs of the particular person who adopts it.

Re-invention often occurs at the implementation stage. Re-invention is defined as the degree to which an innovation is changed or modified by a user in the process of its adoption and implementation. Re-invention often is beneficial to the adopters of an innovation.

Flexibility in the process of adopting an innovation may reduce mistakes and encourage customization of the innovation to fit it more appropriately to local situations or changing conditions. As a result of reinvention, an innovation may be more appropriate in matching an adopter's preexisting problems and more responsive to new problems that arise during the innovation-decision process.

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Recognition of the existence of Re-invention brings into focus a different view of adoption behavior instead of simply accepting or rejecting an innovation as a fixed idea, potential adopters on many occasions are active participants in the adoption and diffusion process, to give their own unique meaning to the innovation as it is applied in their local context. Adoption of an innovation is thus a process of social construction.

5. Confirmation stage: Confirmation occurs when an individual seeks reinforcement of an innovation decision already been made, or reverses a previous decision to adopt or reject the innovation if exposed to conflicting messages about the innovation. The decision to adopt or reject an innovation is not a terminal act.

Human mind is in a dynamic state and an individual constantly evaluates situation. If the individual perceives that the innovation is giving satisfactory results he will continue otherwise may reject it or discontinue it .Reversal of the decision after adoption or rejection of an innovation may, take place at a later state.

At the confirmation stage, extension agents have the additional responsibility of providing supporting messages to individuals who have previously adopted. Extension agents often assume that once adoption is secured, it will continue. But there is no assurance against discontinuance, because negative messages about an innovation circulate via interpersonal networks in most client systems.

Throughout the confirmation stage, the individual seeks to avoid a state of internal disequilibrium or dissonance, an uncomfortable state of mind, by reducing or eliminating it. An individual seeks to accomplish it by changing one's knowledge, attitudes or actions.

Farmer seeks to accomplish it by changing his knowledge, attitude or actions. Rejection is decision not to adopt an innovation. This may be of two types, active rejection and passive rejection. When a farmer rejects after adopting the innovation including even its trial is called Active Rejection and simply non-adoption is called Passive Rejection.

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Discontinuance is a decision to reject an innovation after having previously adopted it. Discontinuance may also take two forms. Replacement discontinuance is a decision to reject an idea in order to adopt a better idea that supersedes it. Disenchantment discontinuance is a decision to reject an idea as a result of dissatisfaction with its performance. Crop varieties generally deteriorate after a number of years. They are then replaced by superior varieties, if available, or may not be cultivated at all.

9.6 Adopter Categories

Adopter categories are the classification of the members of social system according to their adoption of an innovation. All individuals in a social system do not adopt an innovation at the same time. Rather, they adopt in an ordered time sequence, and they may be classified into adopter categories on the basis of when they first begin using a new idea.

They may be classified into adopter categories on the basis of their innovativeness. Innovativeness is the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a system. In the Transfer of Technology (TOT), it is of great practical utility for the extension personnel to identify the individuals who are likely to adopt innovations early and who may lag behind.

The adoption of an innovation over time follows a normal, bell-shaped curve when plotted over time on frequency basis. If the cumulative number of adopters is plotted, it results in an 'S'- shaped curve. The S-shaped curve rises slowly at first when there are few adopters in a time period, accelerate to a maximum when about half of the individuals in the system have adopted and then increases at a gradually slower rate as the few remaining individuals finally adopt.

The S-shaped curve is like that of a 'learning curve' as propounded by the psychologists. Each adoption in the social system is in a sense equivalent to a learning trial by an individual. The bell-shaped curve shows these data in terms of the number of individuals adopting each year, whereas the S-shaped curve shows these data on cumulative basis.

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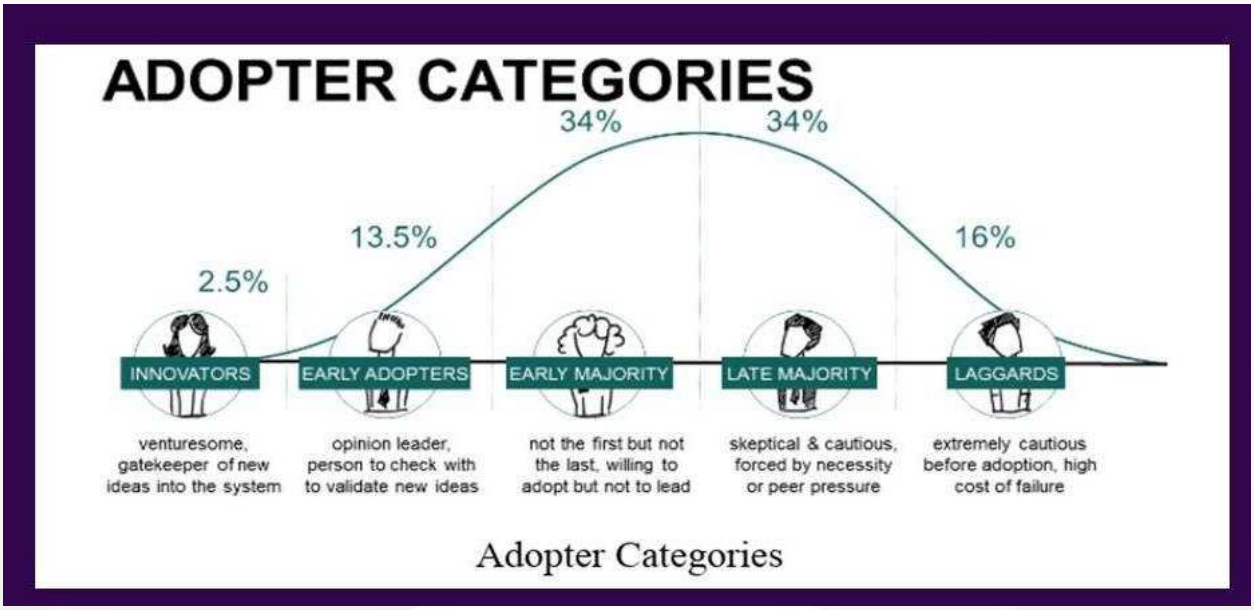
The distribution of adopters over time closely approaches normality, and may be explained by the statistical concept of normal curve. The distribution of the adopters may be partitioned into five adopter categories by using the mean (x) and standard deviation. The five-adopter categories are conceptualized as ideal types and are presented in Figure given below.

Fig 9.4 Adoptive categories



9.6.1 Adopter Categories and their Characteristics

There are different categories of farmers. According to Rogers (1971), the farmers based on their innovativeness can be classified as

1. Innovators (Venturesome)
2. Early adopters (Respectable)
3. Early majority (Deliberate)
4. Late majority (Skeptical)
5. Laggards (Traditional)

1. Innovators (Venturesome):

They are venturesome and first people to adopt a new idea, much ahead of other members in the community. They are generally very few in number and

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not more than one or two in a community. They may deviate from the social norm and may be viewed as deviants by others.

Key Characteristics:

1. Have larger farms

2. High net worth and risk capital.

3 Willing to take risks.

4. Usually not past middle age.

5. Generally well educated.

6. Have respect and prestige in progressive communities but not in conservative type of communities

7. Mentally alert and actively seeking new ideas.

8. Their sphere of influence and activity often goes beyond the community boundaries.

9. They have many formal and informal contacts outside the immediate locality.

10. They often bypass the local extension worker in getting information from the originating sources and may learn about new things even before he does. They sometimes manage to get samples of seeds or chemicals even before they are released for public use.

11. They subscribe to many farm magazines and specialized publications

12. Other farmers may watch the innovators and know what they are doing but the innovators are not generally named by other farmers as "neighbours and friends" to whom they go for information.

2. Early adopters (respectful):

They are localite and are a more integrated part of the community. Because early adopters are not too far ahead, the average members of the community can comprehend their activities relating to adoption of the innovation. They

have more opinion leadership and potential adopters look to them for advice and information about the innovation. They try to maintain adoption leadership to keep up their prestige in the community.

Key Characteristics:

1. Younger than who have a slower adoption rate, but not necessarily younger than the innovators

2. They are not the persons who test the untried ideas but they are quickest to use tried ideas in their own situations

3. Have large farms.

4. Higher education than those who adopt more slowly.

5. High income

6. They participate more in the formal activities of the community.

7. They also participate more in government programmes.

8. This group usually furnishes a disproportionate amount of the formal leadership (elected positions) in the community.

9. They read papers and farm journals and receive more bulletins than people who adopt later. 10. They may be regarded as “community adoption leaders.”

3. Early majority (Deliberate and local adoption leaders):

They adopt new ideas just before the average members of the community. They are neither very early not relatively late to adopt an innovation. They are deliberate and take longer time to make the decision to adopt, in comparison to the innovators and early adopters.

Key Characteristics:

1. Slightly above average in age, education and farming experience.

2. They take a few more farm Journals and bulletins than the average.

3. They have medium high social and economic status.

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4. Less active in formal groups than early adopters, but more active than those adopting later.

5. In many cases, they are not formal leaders in the associations in the community, but they are active in those associations.

6. They actively participate in extension programmes like training, demonstration, kisan mela, study tour etc.

7. They are most likely to be informal leaders, but not holders of elected positions.

8. Have more limited resources than early adopters and innovators, and so cannot afford to make hasty or poor decisions.

9. They associate mainly with people of their own community.

10. They value highly the opinions their neighbours and friends hold about them for, this is their main source of status and prestige.

11. They are mostly mentioned as “neighbours and friends” from whom the majority of farmers seek information.

4. Late majority (skeptical and later adopters):

They are cautious and skeptical, and adopt new ideas just after the average members of the community. They adopt mainly because people have already adopted the innovation and are getting the benefit out of it.

Key Characteristics:

1. Those in this group have less education and are older than the early majority.

2. They form the major part of formal organisational membership, although they participate less in such formal groups.

3. They take fewer leadership roles than the earlier adopters.

4. They take and read fewer papers, magazines and bulletins, than the early majority.

5. They do not participate in as many activities outside the community as do people who adopt earlier.

5. Laggards (traditional):

Laggards are the last people to adopt new practices and are traditional. By the time the laggards finally adopt an innovation, it may already have been superseded by a more recent idea which the innovators are already using.

Key Characteristics:

1. Least education.

2. Oldest.

3. Participate least in formal organisations, cooperatives and government programmes.

4. They hardly read farm magazines and bulletins.

5. These people are likely to belong to the backward classes, may be working as sharecroppers and agricultural labourers, with very little land of their own.

6. They are generally resource poor people with little surplus to invest in their production enterprise.

7. They generally live in areas having least urban influence and, socially and economically the most disadvantaged.

9.7 Factors Influencing Adoption Process

The adoption behaviour of an individual farmer is influenced by various factors. It is obvious that the individual behavior influenced by personal, psychological, social, cultural and situational and environmental factors. Following are some important factors.

9.7.1. Personal and Psychological Factors

Why some people adopt new ideas and practices more quickly than others relates in part to the individual himself.

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(1) Age: Elderly farmers seem to be some what less inclined to adopt new practices than younger ones. For example farm advisory through social media may not be easily adopted by old aged farmers. (However, the findings of several Indian studies do not support the existence of a negative relationship between age and adoption).

(2) Education: More than eight years schooling is almost always associated with higher adoption rates than lesser amounts. Highly educated may take calculated risk to adopted new technology for development of agro-enterprise.

(3) Psychological characteristics:

a) Exposure to reliable sources of farm information may create a state of rationality which in turn predisposes.

b) A mentally flexible person has higher adoption rates than one with mental rigidity.

c) Some people are found to be more prone to change than others.

(4) Values and attitudes (cultural characteristics):

(a) Values found to be positively related to farm practice adoption rates are: a desire by farmers and their wives for a high school or college education for their children, a high emphasis on science and material comfort, and also wide contacts within and beyond the community.

(b) A high emphasis on traditionalism, isolationism and security e g., owning farm free of debt) has been found to be negatively associated with adoption of improved practices.

9.7.2 Social Factors

Community standards and social relationships provide the general framework wherein the process of change occurs, and they account for the differences between one community or group and another.

1. Social values: In some groups and communities, people place a higher value upon material gains and money than they do in others. In some other groups;

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changes in farming are encouraged and expected; prestige is attached to the adoption of new ideas and techniques. In others, more value is placed upon tradition and little freedom is allowed for the individual to deviate from the group's pattern in adopting innovations.

If the adoption of new practices goes contrary to the established customs and traditions of the people, the innovator may be ridiculed or lose prestige.

The extent to which changes are adopted depends on the values and expectations of the group and upon the extent to which the individual is expected to conform. Where there is great emphasis on maintaining traditions and values rooted in the past, change occurs more slowly. On the other hand, where emphasis is upon individualism and personal success, change occurs more rapidly.

2. Local Leadership: The acceptance of change is also influenced by the nature of leadership and control in the group or community. In some communities, none would accept a new idea, unless and until one man (the leader) in the community is sold on the idea. Once sold, he would influence all farmers in the community to accept it. In such situations, it is important to identify and use such influential leaders. The influence of informal leaders is likely to be greater where neighbour, kinship and community ties are the strongest.

3. Social contacts: The nature and extent of social contact within, and outside the community is important in the diffusion of new ideas and techniques, as indicated below:

a) Nature of Social contacts: The presence of organizations whose objectives include the promotion of changes will aid directly and indirectly in the diffusion process. On the other hand, where social contacts are primarily through kinship, visiting and informal activities, there may be greater resistance to change.

b) Extent of Social contacts: The extent to which social contacts are confined to the immediate locality is a factor. The broader the social orientation of the people, the more likely they are, to accept new ideas. Only a few individuals

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may have such outside contacts, but they may be in a position to influence their neighbours. Local orientation on the part of the majority is not necessarily a limiting factor on the diffusion of new ideas, so long as a few leaders have outside contacts.

c) Social distances: The social distances associated with wide status differences are also a factor in the diffusion of farm information through inter-personal channels. For example, tenant farmers in some areas may not get ideas from the large farm owners because of their lack of contact. Also small-scale farmers may fail to communicate with large-scale farmers. Rigid class structure impairs inter-class communication of ideas.

9.7.3 Situational Factors

Reasons why farmers adopt farm practices more quickly at one time than another relate to the situation in which they find themselves when alternative courses of action become known.

1. The nature of the practice: The speed with which adoption will take place is partly dependent on the nature of practice itself.

A) Complexity: Generally speaking, the more complex a practice and the more change it requires in the existing operations, the more slowly it will be adopted.

The following classification of practices in terms of their complexity roughly represents the decreasing order of speed with which acceptance may be expected to occur:

a) A simple change: A change in materials and equipment only, without a change in technique or operation (e. g., new variety of seed).

b) Improved practice: Change in existing operation with or with-out a change in materials or equipment (e. g., change in rotation of crops).

c) Innovation: Change involving new technique or operation (e. g., contour cropping).

d) Change in total enterprise: e. g., from cereal crop to floriculture.

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B) Cost: Those practices which cost little seem to be adopted more rapidly than those which are more expensive. (E.g. horticultural implements)

C) Net returns: Those practices which yield, the greatest marginal returns per rupee invested, and in the shortest time seem to be adopted most readily.

The above two characteristics viz., cost and net returns are also referred to as "relative advantage" or "Profitability".

D) Compatibility: Is the degree to which an innovation is consistent with existing values and past experiences of the adopters. An idea that is not compatible with the cultural norms of a social system will not be adopted so rapidly as an idea that is compatible e. g., the lack of compatibility of beef production with cultural values in India.

E) Divisibility (Trialability): Is the degree to which an innovation may be tried on a limited basis. New ideas that can be tried on a small scale or on the instalment plan will generally be adopted more rapidly than innovations that are not divisible. e. g., new seeds or fertilizers can be tried on a small scale, but new machinery or a thing like cow dung gas plant cannot be so tried.

F. Communicability (Observability): Is the degree to which the results of an innovation may be diffused to others. The results of some practices are easily observed (e. g., application of nitrogenous fertilizer to plants), while the results of some innovations are not easily observed (e. g., pre-treatment of seeds, or soil conservation measures).

2. Farm income: High farm income nearly always is associated with high adoption levels.

3. Size of farm: Size of farm is nearly always positively related to the adoption of new farm practices.

4. Tenure status: Adoption scores are usually higher for owner cultivators than for tenant cultivators.

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5) Sources of farm information used:

a) The number of sources used or the number of contacts with information sources is positively related to adoption rates.

b) A high positive correlation is particularly evident with the use of such sources as Government agencies.

c) High dependence on relatives and friends as sources of information is usually negatively associated with the adoption of new farm practices.

6. Level of living: Since successful farm practice adoption is instrumental in providing the means for supporting a higher level of living, a positive correlation between the two would be expected and is generally found.

9.8 Concepts relating to Adoption and Diffusion

1. Dissonance: An internal disequilibrium or an uncomfortable state of mind of an individual to adopt or reject an innovation.

2. Rejection: It is a decision not to adopt an innovation. Rejection may take two forms.

a) Active rejection: It consists of considering adoption of innovation (including even its trial) but then deciding not to adopt it.

b) Passive rejection (also called Non-adoption): It consists of never really considering the use of the innovation.

3. Discontinuance: It is a decision to reject an innovation after having previously adopted it. Discontinuance is of 2 types

a) Replacement discontinuance: It is a decision to reject an idea in order to adopt a better idea that supersedes it.

b) Disenchantment discontinuance: It is a decision to reject an idea as a result of dissatisfaction with its performance.

E.g. Crop varieties generally deteriorate after a number of years; they are replaced by superior varieties, if available or may not be cultivated at all.

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4. Rate of adoption: It is the relative speed with which an innovation is adopted by members of a social system.

5. Over adoption: People continue to adopt an innovation rather vigorously, when experts feel that it should not be so done. For example, excessive use of pesticides, excessive use of water through broadcasting method. Over adoption produces negative effect and causes distortion of the systems.

6. Adoption period: The period that takes from awareness stage to the adoption stage by the individual.

7. Innovation-decision period: The innovation – decision period is the length of time required to pass through the innovation – decision process. The time elapsing form awareness- knowledge of an innovation to decision for an individual is measured in days, months, or years.

8. The Diffusion Effect

Not only does change agent effort have a different effect at different points in the sequence of an innovation's rate of adoption, but the system's self-generated pressure towards adoption also change as an increasing proportion of the members of the system adopt. This increasing pressure from interpersonal networks may be termed as the diffusion effect.

9. Consequences of innovation

Consequences are the changes that occur to an individual or to a social system as a result of the adoption or rejection of an innovation. There are at least three categories of consequences.

1. Desirable Vs. Undesirable Consequences: It depending on whether the effects of an innovation in a social system are functional or dysfunctional.

2. Direct vs. Indirect Consequences: It depending on whether the changes to an individual or to a social system occur in immediate response to an innovation or as a second order result of the direct consequences of an innovation.

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3. Anticipated Vs. Unanticipated Consequences: It depending on whether the changes are recognized and intended by the members of a social system or not

Horticultural extension personnel act as facilitator, guide and change agent to motivate the farmers to adopted new technology, practices, varieties etc so that various horticultural technology transfer programme may be successfully implemented

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Course Name	Fundamentals of Extension Education
Lesson 10	Teaching and Learning: Concepts and Principles and Steps
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
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University Name	Kerala Agricultural University, Thrissur

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10.1 Objectives of the Lesson

- To understand the meaning, concept of teaching and learning
- To discuss the various elements, natures and principles of teaching
- To understand the principles of learning, laws and types of learning
- To analyse the elements Learning Situation and its characteristic
- To explain the steps in extension teaching

10.2 Glossary

Teaching is the process of providing situations in which learning takes place

Learning is a process by which a person becomes changed in his behavior through self-activity

Learning Situation: It is a condition or environment in which all the elements necessary for promoting learning are present

Extension teaching is a planned and deliberate act of facilitating situation in farmer learned to change in his behavior

Classical conditioning is a learning process in which an association is made between a previously neutral stimulus and a stimulus that naturally evokes a response.

Operant conditioning is a learning process in which the probability of response occurring is increased or decreased due to reinforcement or punishment

Readiness means the organism is ready to respond or act

Frequency refers to number of repetitions of learning.

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10.3 Meaning and Concept of Teaching and nature of Teaching

Teaching is an act of facilitating, guiding and influencing the learner to modify their behavioural component in desirable one. Teaching is not merely presenting text book information to the students. Teaching is not a mechanical process. It is an intricate, exacting and challenging job.

Teaching is the process of providing situations in which learning takes place; in other words, arranging situations in which the things to be learnt are brought the attention of the learners, their interest is developed, desire aroused, conviction created, action promoted and satisfaction ensured.

Teaching is an active process in which one person shares information with others to provide them with the information to make behavioral changes.

10.3.1Nature of Teaching

Teaching is an art in the sense that it relies heavily on intuition. In this approach teaching is more by subjective and spontaneous methods. At the other end of the continuum, it is said that teaching is a science by itself in the sense it depends primarily on behaviorally oriented model.

It is quite possible that there are natural qualities or traits in certain persons that predispose them to being better teachers. However, on the other hand it is also essential that all teachers master certain teaching skills to be successful. In this context, it is wise to consider that both the approaches - teaching as an art; teaching as a science, are not mutually exclusive, if any they are synergistic.

An ideal teacher is concerned with the development of the whole child/pupil – intellectually, socially, spiritually and in some degree, physically. In the light of these requirements, the modern teaching process stresses three fundamentals:

1. Emphasizing the learner: The teacher today must be interested in facts and skills as such, but his concern is their use as tools that contribute to the child's development. Today's teacher emphasizes the learner. He looks to the students as the starting point for planning learning experiences.

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2. Guiding the learner: The teacher must guide and at the same time remember that learning is a function of the learner and is based upon experiencing. It is the complex art of guiding pupils through a variety of selected experiences towards the attainment of a widening field of learning.

The student must do his own learning, but the teacher can aid by pointing out unnoticed obstacles, answering questions and furnishing supplementary information.

3. Promoting learner development: Each child has his own distinct potential and limitations. The final extent of realization of his possibilities depends on the richness of the child's environment, his initial interaction with it, his later contacts with it, and his ultimate use of the awareness he develops in himself of it and through it.

10.4 Elements in Teaching

Whether the teacher is teaching in the top levels of the university, in a school for adolescents or in a school for children, good teaching demands skill in the same basic elements of the good teaching. The following points shall indicate some of the principles of good teaching which should be borne in mind by the teacher while he is dealing with the students. Since the goal of teaching is desirable learning, the quality of teaching can be tested only in terms of the quality of learning to which it leads.

1. Recognize individual differences among pupils

2. It is need-centered

3. Improves the quality of living of every student

4. Interesting

5. Kind and sympathetic

6. Challenge the student to learn

7. Sense the productive moment

8. Create the learning situation

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9. Causes, facilitates and promotes learning

10. Conforms to the aims of teaching

11. Encourages general development

12. Consideration of the social background of the learners

13. Cannot be tied to any one method

14. Dynamic

15. Reduces the distance between the teacher and the taught

16. Well planned and systematic

The art of teaching calls for a high degree of flexibility, adoptability and nimbleness of mind that goes far beyond the mechanical application of step by step procedures. Thus proper understanding, appreciation and application of the psychological principles help the teachers in improving the overall teaching – learning process.

10.5 Principles of Teaching

Teaching is an intentional purposeful process, not a merely undertaking of information. Effective teaching is done according to design not drift; it is done by plan, not by trial and error.

Good teaching, therefore, requires careful planning of content procedures, methods and techniques. Good teaching is essentially a good communication and good communication requires sympathetic sharing and clear explaining.

Teaching is a complex, multifaceted activity, often requiring us as instructors to juggle multiple tasks and goals simultaneously and flexibly. Hence the following principles of teaching may enhance the effectiveness of teaching learning process.

1. Guide the learner. Be sure that students know the objectives. Tell them what will be next. Provide organization and structure appropriate for their developmental level.

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2. Develop a structured hierarchy of content. Some organization in the material should be clear, but there should be opportunities for the student to do some structuring. Content needs to include concepts, applications and problem solving.

3. Use images and visual learning. Most people prefer visual learning and have better retention when this mode is used. Encourage students to generate their own visual learning aids.

4. Ensure that the student is active. Students must actively grapple with the material.

This can be done internally or externally by writing or speaking.

5. Require practice. Learning complex concepts, tasks, or problem solving requires a chance to practice in a non-threatening environment. Some repetition is required to become both quick and accurate at tasks.

6. Provide feedback. Feedback should be prompt and, if at all possible, positive. Reward works much better than punishment. Students need a second chance to practice after feedback in order to benefit fully from it.

7. Have positive expectations of students. Positive expectations by the professor and respect from the professor are highly motivating. Low expectations and disrespect are demotivating. This is a very important principle, but it cannot be learned as a "method." A master teacher truly believes that her or his students are capable of great things.

8. Provide means for students to be challenged yet successful. Be sure students have the proper background. Provide sufficient time and tasks that everyone can do successfully but be sure that there is a challenge for everyone. Success is very motivating.

9. Individualize the teaching style. Use a variety of teaching styles and learning exercises so that each student can use his or her favourite style and so that each student becomes more proficient at all styles.

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10. Make the class more cooperative. Use cooperative group exercises. Stop grading on a curve and either use mastery learning or grade against an absolute standard.

11. Ask thought-provoking questions. Thought-provoking questions do not have to have answers. Posing questions without answers can be particularly motivating for more mature students.

12. Be enthusiastic and demonstrate the joy of learning. Enthusiasm is motivating and will help students enjoy the class.

13. Encourage students to teach other students. Students who tutor others learn more themselves and the students they tutor learn more. In addition, students who tutor develop a sense of accomplishment and confidence in their ability.

14. Care about what you are doing. The professor who puts teaching "on automatic" cannot do an outstanding job.

15. If possible, separate teaching from evaluation. If a different person does the evaluation, the teacher can become a coach and ally whose goal is to help the student learn.

10.6 Steps in extension teaching

Extension teaching is a planed and deliberate act on the part of the extension agent. The conscious attention to organization of teaching activities in a sequence greatly increases the efficiency of learning. The extension worker, therefore, plans and arranges situations and activities whereby the things to be learned are called to the attention of the prospective learner, his interest is developed, desire aroused, conviction created, action promoted and satisfaction ensured.

The extension agent has to move step by step in a scientific way to impart training to the clients who are farmers, farm women, and rural youth. The role of the extension agent is that of a facilitator and motivator. Though details of the procedure may vary from situation to situation, there are some steps

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which are basic to extension teaching. These are presented below as suggested by Wilson and Gallup (1955).

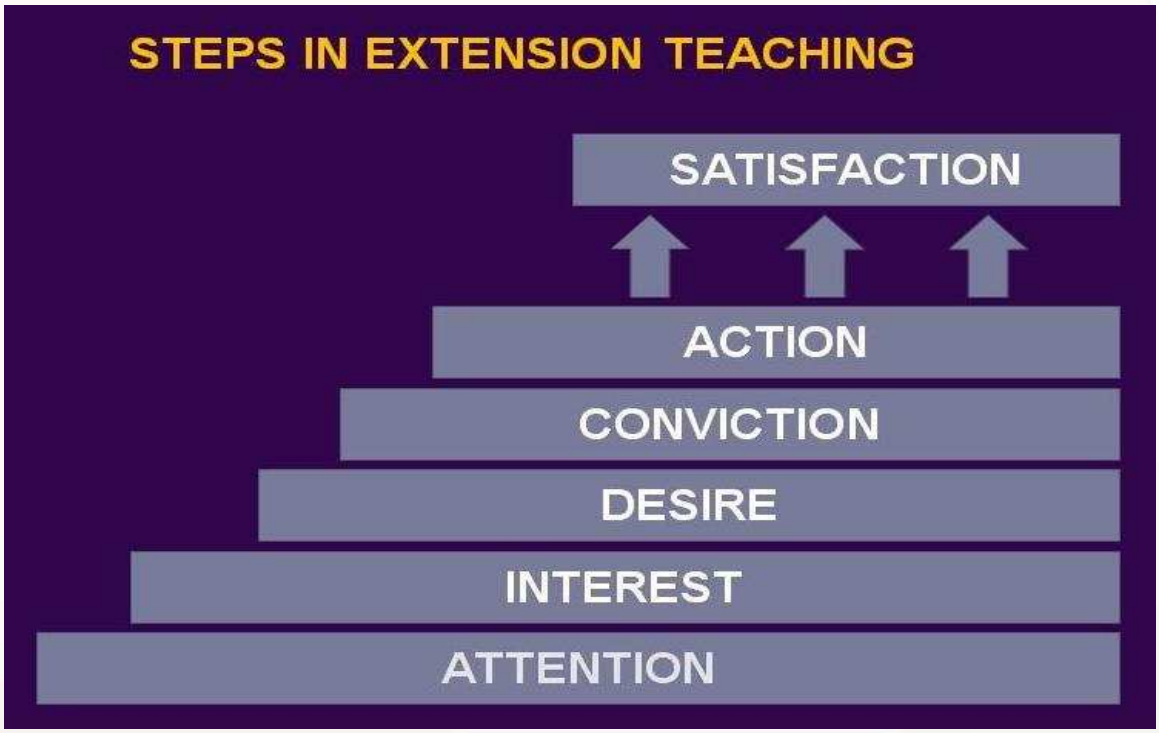

Fig 10.1: Steps in extension teaching (AIDCAS)

Step – 1: Getting the ATTENTION of the learner

1. Farmers are not always aware of the improvements of scientific research and successful experiences of other farmers. So the first task of the extension teacher is to direct the attention of the farmers to the new or better idea

2. Until the individual's attention is focused upon the change that is considered desirable, there is no recognition of a problem to be solved or a want to be satisfied

3. Attention is the starting point to the arousing of interest. The extension worker creates a desire for information for of those who are indifferent to improvements in agriculture

Step – 2: Stimulating the learner's INTEREST

1. The fundamental difference between the awareness and interest stages is that in awareness stage the exposure to an innovation may be accidental or

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non-purposive, whereas the behavior of an individual at latter stage is purposive

2. Once attention has been captured it becomes possible for the teacher to appeal to the basic needs of the individual and arouse his interest

3. The teacher in easy stages reveals to the learner how the new practice will contribute to the learner's welfare

4. The teacher's message should be presented attractively and in a manner that requires little mental effort on the part of the learner. The presenting of one idea at a time that is definite and specific is another important factor in building interest

Step – 3: Arousing the learner's DESIRE for information

1. The teacher is concerned with continuous stimulation of learner's interest in the new idea until that interest becomes a desire or motivating force sufficiently strong to compel action

2. The teacher explains to the learner that the information applies directly to the learner's situation, that the doing of the thing will satisfy a significant want or need of the learner

Step – 4: CONVINCING the learner that he should act

1. Action follows when desire, conviction and the prospect of satisfaction make it easier for the person to act than not to act

2. The extension worker sees that the learner knows what action is necessary and how to take the action

3. He also makes sure that the learner visualizes the action in terms of his own peculiar situation and has acquired confidence in his own ability to do the thing

Step – 5: Getting ACTION by the learner

1. Unless the conviction is converted into action, the teaching effort is fruitless.

2. The extension worker should make the action easy to the learner by removing the blocks and annoyances that prevent the action

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3. If a serious pest is controlled by the use of a new chemical it will not be adopted by the farmers unless that chemical is readily available at a fair price at reasonable distance

4. If action does not follow soon after the desire and conviction have been created the new desire soon fades away and people continue as before

5. This phase of extension work is often neglected

Step – 6: Making certain that the learner obtains SATISFACTION from his action

1. The end product of the extension teaching effort is satisfaction that comes to the farmer as a result of change in behavior i.e. learning a new skill, new knowledge etc.

2. The extension teacher helps the learner in evaluating the progress made and builds the learner's confidence in his ability to continue action with increasing satisfaction

3. Satisfaction is the motivating force for further learning and the goals of the learning should be simple. The extension teacher should break down the difficult job in to smaller ones that are easier to accomplish

4. 'A satisfied customer is the best advertisement' applies to the extension worker as much as to the retail merchant

It must be understood that the above six steps in extension teaching often blend (mix) with each other and lose their clear-cut identity. There is similar overlapping in the extension methods used to advance each of the different steps. All methods are not equally effective for different stages in this process. Nevertheless, one method may, under certain condition, contribute to several steps e.g. mass media.

Criteria for effective Extension Teaching:

1. Extension teaching requires specific and clearly defined teaching objectives. Teaching must be clearly conceived and specifically defined. There must be

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clear cut concept about the end product, i.e. what is going to be achieved. Factors to be considered for deciding on the teaching objectives

- People to be taught
- Behavioral changes to be developed in people
- Content or subject matter to bring the desired change in behaviour
- The real life situation in which the action is going to take place

2. Extension teaching requires a suitable learning situation

3. Extension teaching requires effective communication

4. Extension teaching requires both content and method

5. Extension teaching must be looked upon as an intentional process

6. Extension teaching must accomplish certain kinds of educational changes in relation to the subject matter taught

7. Extension teaching requires careful evaluation of results

10.7 concept, nature and types of learning

10.7.1 Meaning and Definitions of learning

Learning is the process by which a relatively permanent change in potential behaviour occurs because of practice or experience. Learning is also a process of acquiring modifications in existing knowledge, skills, habits, or tendencies through experience, practice, or exercise.

Gates et al -Learning is the modification of behaviour through experience

Henry, P Smith-Learning is the acquisition of new behaviour or strengthening or weakening of old behavior as a result of experience.

Crow and Crow-Learning is the acquisition of habits, knowledge and attitudes. It involves new ways of doing things, and it operates in an individual‘s attempt to overcome obstacles or to adjust to new situations.

Skinner- Learning is the process of progressive behaviour adaptation.

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Attributes of learning can be inference from the above definitions as follows:

1. As Process: the first is that learning is permanent change in behaviour.

2. It does not include change due to illness, fatigue, maturation and use of intoxicant.

3. The learning is not directly observable but manifests in the activities of the individual.

4. Learning depends on practice and experience.

10.7.2 Nature and characteristics of Learning:

1. Learning is a Continuous Process:

After birth, the child acquires skill from experiences obtained from the environment. Hence, leaning continue throughout life. Learning can be formal or informal and it may be direct or indirect. When a learner learns he develops, knowledge, skills, habits, attitudes, and aptitudes.

2. Learning is Change in behavior:

The result of the Learning process can be measured as behavioral changes. This change can be in any form. It can be desirable or undesirable. But in desirable form, i.e. these changes should occur in a positive direction. Learning includes all three aspects of human behavior. So, it includes cognitive, affective and conative aspects of mental process. for example, farmer change his understanding to adopt new techniques

3. Learning is a universal process:

Learning is a universal process. It can happen everywhere. Learning is a process for all living creatures. Human being across all cultures learns as it is a lifelong process.

4. Learning is Purposive and Goal-oriented:

Learning is always has a purpose. It is goal-oriented in the sense that the teacher always has learning objectives in mind while teaching. If we don't have any aim and goal, then the process of learning will not show any effect.

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Through the process of learning, we can move towards pre-determined learning objectives. As the learner learns, he/she move towards a pre-determined goal.

5. Learning is a process of progress and Development:

Learning can occur in any direction. Theses directions can be desirable or undesirable. We want to bring the individual's development in a desirable direction through learning. We do not want a child to learn in undesirable directions like stealing or pick-pocketing. So learning should bring progressive changes in the behavior of the learner.

6. Learning is adaptation or adjustment: All persons continuously interact with their environment. We often make adjustment and adapt to our social environment. Through a process of continuous learning, the individual prepares himself for necessary adjustment or adaptation. That is why learning is also described as a process of progressive adjustment to ever changing conditions, which one encounters.

7. Learning is improvement: Learning is often considered as a process of improvement with practice or training. We learn many things, which help us to improve our performance.

8. Learning is organizing experience: Learning is not mere addition of knowledge. It is the reorganization of experience.

9. Learning brings behavioural changes: Whatever the direction of the changes may be, learning brings progressive changes in the behaviour of an individual. That is why he is able to adjust to changing situations.

10. Learning is active: Learning does not take place without a purpose and self-activity. In any teaching learning process, the activity of the learner counts more than the activity of a teacher.

11. Learning is goal directed: When the aim and purpose of learning is clear, an individual learns immediately. It is the purpose or goal, which determines what, the learner sees in the learning situations and how he acts. If there is no

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purpose or goal, learning can hardly be seen. Goal of farmer may be doubling of farm income

12. Learning is universal and continuous: All living creatures learn. Every moment the individual engages himself to learn more and more. Right from the birth of a child till the death, learning continues.

Characteristics of learning

Yoakum & Simpson have stated the following general characteristics of learning: Learning is growth, adjustment, organisation of experience, purposeful, both individual and social product of the environment.

According to W.R McLaw learning has the following characteristics.

1. Learning is a continuous modification of behavior which continues throughout life
2. Learning is pervasive. It reaches into all aspects of human life.
3. Learning involves the whole person, socially, emotionally & intellectually.
4. Learning is often a change in the organisation of behaviour.
5. Learning is development. Time is one of its dimensions.
6. Learning is responsive to incentives. In most cases positive incentives such as rewards are most effective than negative incentives such as punishments.
7. Learning is always concerned with goals. These goals can be expressed in terms of observable behaviour.
8. Interest & learning are positively related. The individual learns best those things, which he is interested in learning. Most boys find learning to play football easier than learning to add fractions.
9. Learning depends on maturation and motivation

10.7.3 Types of Learning:

1. Affective learning has to do with feelings and values and therefore influences our attitudes and personalities. Famer's feelings towards the new vitamin rich variety of fruit crop is the affective learning.

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2. Cognitive learning is achieved by mental processes such as reasoning, remembering and recall. It helps in problem solving, developing new ideas and evaluation.

3. Motor learning: Most of our activities in our day-to-days life refer to motor activities. The individual has to learn them in order to maintain his regular life, for example walking, running, sowing, planting, harvesting, etc. All these activities involve the muscular coordination.

4. Verbal learning: This type of learning involves the language we speak, the communication devices we use. Signs, pictures, symbols, words, figures, sounds, etc, are the tools used in such activities. We use words for communication. For instance use ICT by farmers for technology transfer.

5. Concept learning: It is the form of learning which requires higher order mental processes like thinking, reasoning, intelligence, etc. we learn different concepts from childhood. For example, when we see a dog and attach the term 'dog', we learn that the word dog refers to a particular animal. Concept learning involves two processes, viz. abstraction and generalisation. This learning is very useful in recognising, identifying things.

6. Discrimination learning: Learning to differentiate between stimuli and showing an appropriate response to these stimuli is called discrimination learning. Example, sound horns of different vehicles like bus, car, ambulance, etc.

7. Learning of principles: Individuals learn certain principles related to science, mathematics, grammar, etc. in order to manage their work effectively. These principles always show the relationship between two or more concepts. Example: formulae, laws, associations, correlations, etc.

8. Problem solving: This is a higher order learning process. This learning requires the use of cognitive abilities-such as thinking, reasoning, observation, imagination, generalization, etc. This is very useful to overcome difficult problems encountered by the people.

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9. Attitude learning: Attitude is a predisposition which determines and directs our behaviour. We develop different attitudes from our childhood about the people, objects and everything we know. Our behaviour may be positive or negative depending upon our attitudes. Example: attitudes of nurse towards her profession, patients, etc

10.8 Principles of Learning

1. Principle of Association: Learning is a growth like and continuous. The kind of learning that takes place is the results of the kind of experiences we have. Experiences that occur together tend to recur together. Previous learning always sets the stage for subsequent learning.

Implications for Teaching

• Begin at the level of the learner.

• New must be related to the old.

• Adjust the pace to the learner's capacity, one idea at a time.

• Bring the idea to the attention of the learner repeatedly (in a variety of ways) and over a period of time.

2. Principle of Clarity: Learning is purposeful. Learning varies directly with the meaningfulness of the material presented. Learning is increased when the learner sees the end sought by the practice.

Implications for Teaching

•Learning must make sense to the learner.

•Progress must be constantly appraised and redirected.

•Purpose must be kept in sharp focus; (objectives must be clear to the learner and teacher).

3. Principle of Self-activity: Learning results through self-activity. It is an active process on the part of the learner. Teachers can only set up the learning situation and stimulate a person to learn. The door to learning is "locked on

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the inside" and unless the learner opens the door himself, learning cannot take self.

Learning involves appropriate activities that engage a maximum number of senses.

Implications for Teaching

• Activities appropriate to the specific learning situation must be used.

•Learning activities should engage a maximum number of senses, by using audio-visual aids. Senses are the gate-ways to learning.

4. Principle of Readiness (Motivation) and Principle of Rewards (Satisfaction): Learning must be challenging and satisfying. Readiness does not connote mere desire to learn; it includes social and intellectual maturity as well. The more fully a person is in readiness to act in a certain way, the more satisfying it will be for him, and the more annoying if he is prevented from it. When not ready to act, he is annoyed if made to act. A favorable attitude accelerates learning; a bad attitude retards learning.

Without drive or interest, a person does not learn. Consequently, learning depends primarily upon satisfaction of wants or needs, in other words, upon success. Rewards maintain and strengthen the learning process.

Implications for Teaching

•Teacher motivation of the student is essential in making learning more challenging.

•Standards demanded of the learners should be suitable to their ability or capacity.

•Appropriate and timely recognition should be given to the student achievement.

5. Principle of Practice (or Law of Exercise): Learning must result in functional understanding. Memorization alone is temporary unless reviewed or put to use in a practical situation. The oftener a situation evokes or leads to a certain

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response, the stronger becomes the tendency for it to do so in future. Practice leads to perfection; (not mere countless repetitions).

Implications for Teaching

•Course content should be organized into meaningful units.

•Theory should be related to practice.

•Provide activities that stimulate actual use situations.

6. Principle of Disassociation: Learning is affected by emotions. The intensity of emotional feeling affects learning differently in different individuals. The most effective way of eliminating an undesirable response is to set up a desirable substitute, which must he made more satisfying than the original (undesirable) reaction.

Implications for Teaching

•Strive to increase pleasant emotions and decrease unpleasant emotions of students in connection with the learning process.

•Train the expression of emotions in the right direction.

7. Principle of Timing: Learning takes place more readily when the facts or skills are given at the time or just before the time they are to be used in a serviceable way.

Implication for Teaching

•Select the appropriate time, depending on the learning activity: (neither too early, nor too late).

8. Principle of Environment: Learning is affected by the physical and social environment.

Implications for Teaching

•The general physical environment includes physical facilities should be suitable to the kind of learning taking place.

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•Specific physical factors of the meeting place should be suitable to the activities selected for use in the learning situation.

•The teacher should recognize and utilize the effects of the social environment on learning.

Summarizing the major points,

Optimum learning takes place:

•When the learner is in a state of physiological and psychological readiness.

•When he repeats at intervals, the learning series which is to be mastered and

•When that series is accompanied by an emotionally satisfying experience. The major task of the teacher is to arrange the learning situation so that these conditions prevail.

9. Principle of transfer: Application of perceived relationship to another situation in which it is applicable. Unless knowledge or learning can be applied in a new situation, it remains very much restricted.

10. Principle of set or attitude: An unfavourable attitude or set retards learning and a favorable attitude accelerates it. Unless attitude becomes favourable, adoption will not take place.

11. Principle of clarity of objectives: The objective of learning should be clear. The ease of learning seems to vary directly with the meaningfulness of the material presented. Meaningful learning is interesting and easier than senseless learning.

In addition to understanding the principles underlying how adults learn, training must also plan experiences and activities that maximize the learning of trainees. Edgar Dale's 'Cone of Experience', as modified by Sheal (1989), provides a linkage between learning, activity and participant involvement.

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10.9 laws, theories and methods of learning

Laws of Learning:

EL Thorndike has explained three laws of learning called Primary laws and in addition to these, he has also framed 5 subsidiary laws in connection with his trial and error learning theory.

Primary laws:

These are the most important laws, which explain the basic aspects of learning. They are:

1. Law of readiness:

By readiness means the organism is ready to respond or act. This is more essential prerequisite for learning.

This indicates that the animal or human being is motivated to learn. This condition of readiness has two effects — satisfaction and annoyance. When the animal is ready to act- if permitted- it gives pleasure. If it is not permitted, it feels annoyed.

In the same way when the animal is not ready to learn- if asked to learn- it is annoying. On the other hand, if it is prevented from learning it gives pleasure.

These points have been given below in the words of Thorndike:

a. For a conduction unit ready to conduct-to conduct is satisfying.

b. For a conduction unit ready to conduct-not to conduct is annoying.

c. For a conduction unit not ready to conduct- to conduct is annoying.

This law clearly shows that readiness of a person to learn is very important. Hence motivate him to learn.

2. Law of exercise:

This law is also known as law of frequency. Frequency refers to number of repetitions of learning. Thorndike believed that repeated exercising of a response strengthens its connection with stimulus.

This aspect refers to law of use and disuse, which explains that, anything not in use will perish. So also if the response is not repeated, its bond with stimulus gets weakened. This is also according to the statement that 'practice makes man perfect'.

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In Thorndike's experiment the cat becomes perfect after repeating the response more number of times, i.e. it learnt to open the door without committing any error.

3. Law of effect:

This law states that when a connection is accomplished by satisfying effect - its strength is increased. By this, Thorndike meant that the probability of its occurrence is greater. In his experiment if the hungry cat succeeded in opening the door, would get its favourable dish to eat.

This had a positive effect on its response. Rewards always strengthen connections between stimuli and responses, and on the other hand, punishment weakens connections.

Secondary laws:

In addition to the three primary laws explained above, Thorndike has given five secondary or subsidiary laws also.

They are as follows:

a. Law of multiple response:

It means when a response fails to elicit a desired effect, the learner will try with new responses until the goal is reached.

b- Law of set or attitude:

Mental set or positive attitude is very important in any learning.

c. **Law of associative shifting:**

This is nothing but shifting of the response to a new situation which is similar to the earlier one. Because the fundamental notion is that, if a response can be kept intact through a series of changes in stimulating situation, it may finally be given to a new situation.

d. Law of prepotency of elements:

This law states that the learner is able to react in a selected way, only to the salient elements of the problem and not for other unimportant elements.

e. Law of response by analogy:

It means comparing a new situation to the previously learned one and thus giving a response by analogy.

As stated above, Thorndike formulated these laws on the basis of his experiments. According to the law of readiness, the cat was ready to learn,

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because it was hungry. This hunger motivated the cat to learn to open the door.

According to the second law, the cat was repeatedly given trials and exercise which strengthened its learning. Finally, on each trial the cat was given reinforcement in the form of fish.

This encouraged the cat to continue its effort to learn to open the door. The secondary laws given by him support these findings. These laws are highly relevant to the field of education. The teachers can make use of these laws in order to make their teaching more effective.

Theories of Learning:

Psychologists have tried to explain how people learn and why they learn. They have conducted many experiments on animals and children and come to certain definite conclusions which explain the modes of learning.

These are called as theories of learning. In many books, these explanations are treated as kinds of learning. In a sense it is true. But the term learning is very comprehensive. It covers a wide range of activities which cannot be explained within a limited framework. There are many theories explaining modes of learning. Important among them are:

Trial and Error Learning Theory:

This theory was developed by an American psychologist EL Thorndike (1874-1949). He argues that learning takes place through trial and error method. According to him learning is a gradual process where the individual will make many attempts to learn. The essence of this theory is-as the trials increase, the errors decrease.

This is possible because of association formed between sense impressions and impulses to action. Such an association comes to be known as a 'bond' or a 'connection, because it is these bonds or connections which become strengthened or weakened in making and breaking of habits. According to this theory when an individual is placed in a new situation, he makes a number of random movements. Among them, those which are unsuccessful are eliminated and the successful ones are fixed.

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These random movements are not eliminated at once. In the first attempt their number is very large, in the second attempt the number of errors diminishes and the range of activity becomes narrower. Gradually the individual learns to avoid unnecessary movements and reaches the goal. Improvement takes place through repetition.

Thorndike studies the character of trial and error learning in a number of experiments on cats-using a box which he called 'puzzle box'. In one of the experiments a hungry cat was placed in the box and the door was closed which could be opened by pressing a Latch. A fish was placed outside the box in a plate.

The cat could see this fish. The cat was given 100 trials-ten in the morning and ten in each afternoon for five days. The cat was fed at the end of each experimental period and then was given nothing more to eat until after the next session. If, succeeded in opening the door in any trial by chance, he went to eat food (fish). A complete record was made of the cat's behaviour during each trial.

In the beginning the cat made a number of random movements like biting, clawing, dashing, etc. gradually in subsequent trials the cat reduced the incorrect responses (errors), as it was in a position to manipulate the latch as soon as it was put in the box.

This experiment revealed that the random movements were decreased gradually, that is-as the trials increased the errors decreased. As the trials increased the solution to open the door (pressing the latch) was discovered and at the end, the cat could open the door with zero error. The time taken in each trial was eventually reduced.

Thorndike conducted many experiments with maze and puzzle box learning in which cats and rats were used. He has demonstrated that through numerous trials the animal learns much and gradually improves his effort.

We all learn many skills like swimming, cycling, riding, etc., through this method. Children learn to sit, stand, walk, and run by this method only. However, this method involves considerable waste of time and effort.

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Learning by Conditioning:

In literal sense, conditioning means 'getting used' to, or 'adjusted 'to a new situation, or a stimulus. It is a process of substituting the original stimulus by a new one and connecting the response with it. There are two types of conditioning theories:

1. Classical conditioning:

This method of conditioning got its name from the fact that, it is a kind of learning situation that existed in the early classical experiments of Ivan P Pavlov (1849-1936), Russian physiologist who was awarded Nobel Prize, in 1904 for his experiments.

Pavlov designed an apparatus to measure the quantity of saliva produced in response to food (meat power). At the beginning of his experiment Pavlov noted that no saliva flowed when he rang the bell. He then trained the dog by sounding the bell, and shortly afterwards presenting food.

After the sound of the bell had been paired with food a few times, he tested the effects of the training by measuring the amount of saliva that flowed when he rang the bell and did not present food. He found that some saliva was produced in response to the sound of the bell alone. He then resumed the training-paired presentation of bell and food a few times and then tested again with the bell alone.

As the training continued, the amount of saliva on tests with the bell alone increased. Thus, after training the dog's mouth watered-salivated- whenever the bell was sounded. This is what was learned; it is the conditioned response. This theory states that CS (bell) becomes a substitute after pairing with UCS (food) and acquires the capacity to elicit a response. It is because the association (conditioning) is formed between CS and UCS.

Fig 10.2 Pavlov experiment on conditioning

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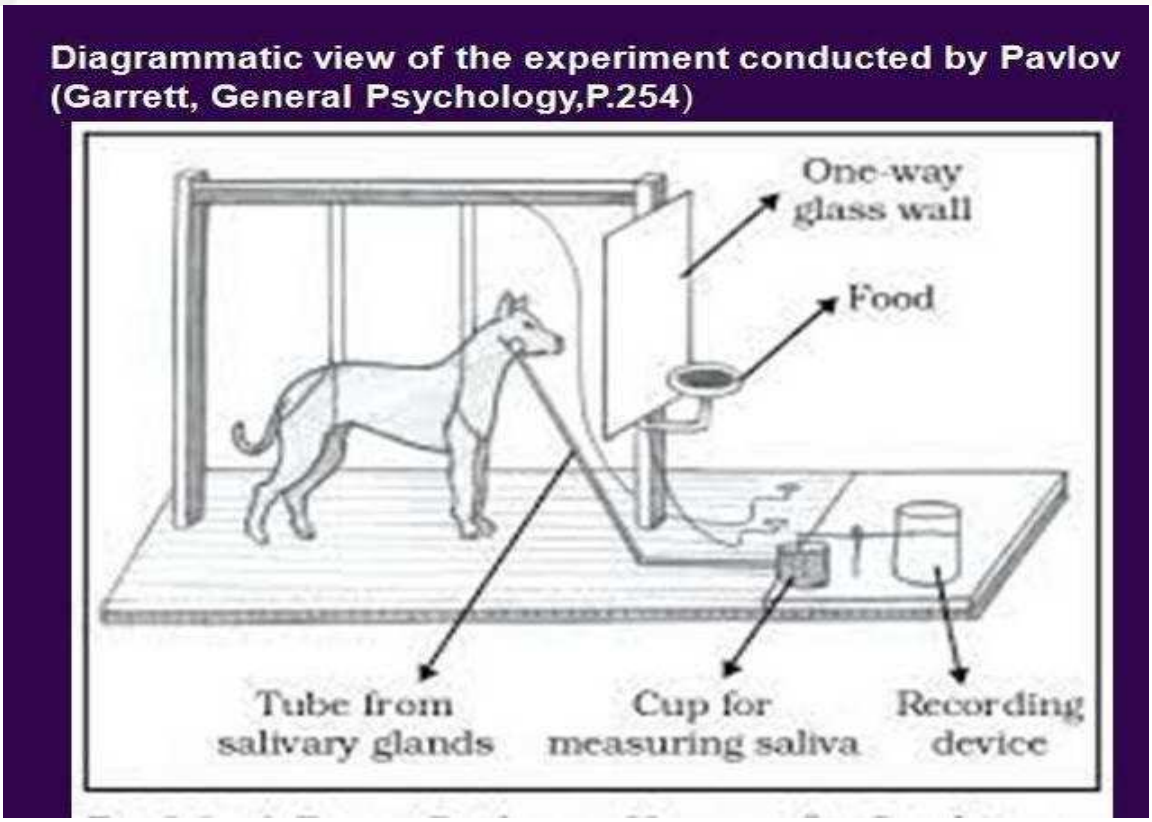

Sub-principles of Classical Conditioning:

There are certain sub-principles which explain the different phenomena of this experiment.

a. Extinction and spontaneous recovery:

Extinction means cessation of a response. The strength of the CS gradually decreases when it is presented alone and not followed by UCS for a number of trails. This process is called 'extinction'. In this experiment when only bell is presented without food for a number of trials, the dog stopped salivation gradually.

But when the CS (bell) was paired again with UCS (food) for some trials, the CR (salivation) recovered. This is known as 'spontaneous recovery'. In spontaneous recovery the dog required less number of trials than the first time, because the association between CS and UCS still existed in the brain of the animal.

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b. Stimulus generalization:

A tendency to respond to a stimulus which is similar to original one is called stimulus generalization, the greater the similarity, the more the generalization. In this experiment, the dog started salivating even for the sound of a buzzer which was similar to bell.

c. Stimulus discrimination:

When there is much difference between two stimuli, the animal can discriminate between the two. For example, if the dog is conditioned to salivate at the signal of red light, it will not salivate when green light is presented.

d. Higher order conditioning:

If a 'light' is presented followed by bell and then by food for a number of trials, the dog will start salivating to light itself. This phenomenon is called higher order condition.

All these principles are very useful in behaviour therapy. Conditioning is not confined only to the laboratory.

In our day-to- day's life we come across many instances of such learning. For example, a small child who does not know, touches a burning candle, it gives him a painful experience and withdraws his hand. Later this experience will make him withdraw from burning objects and avoid them all together.

Conditioning is used as psychotherapeutic technique very effectively in the treatment of abnormal behaviours such as phobias, alcoholism, enuresis, etc. These are called behaviour modification techniques. Watson and others have conducted many experiments to prove the usefulness of this method.

2. **Operant Conditioning:**

This method of conditioning was developed by an American psychologist BF Skinner. This theory is also known as 'Instrumental conditioning', because the animals use certain operations or actions as instruments to find solution.

Skinner conducted his famous experiment by placing a hungry rat in a box called after his name 'Skinner box'. This box was containing a lever and a food tray in a corner of the box. It was so arranged, that the animal was free to move inside the box, but the pressing of the lever would get the animal a pallet of food in the tray as reinforcement.

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Arrangement was also made to record the number of pressings of the lever by a mechanical device. It was found in the beginning that the rat pressed the lever occasionally and used to get food as reinforcement for each pressing. Gradually, as the animal learnt the pressing of lever would give some food, it repeated the responses very rapidly. This rapid increase in pressing the lever is the indication of the animal conditioned to get food.

In day-to-day's life also, much learning takes place in animals as well as in human beings by this method. The reinforcement will be the motivating factor. It will make the organism to repeat its action.

It is on the basis of these experiments, Skinner made his famous statement "Rewarded behaviour is repeated". Instrumental conditioning involves more activity by the learner than classical conditioning. Skinner conducted his experiments on different animals like pigeons, rats, etc.

Reinforcement which is the most important aspect of this experiment is divided into two types: positive reinforcement is used in reward training. Negative reinforcement-like punishment is used to stop undesired responses or behaviours. Operant conditioning is useful in shaping undesirable behaviour and also in modification of behaviour.

This is also useful in training of mentally retarded children to learn dressing, eating and toilet training skills, treatment of phobias, drug and alcohol addictions, and psychotherapy and to teach needed behaviour in children. Further, these experiments have proved that intermittent reinforcement yields better results than continuous reinforcement.

10.10 Elements of Learning Situation

Definition of Learning Situation: It is a condition or environment in which all the elements necessary for promoting learning are present

An effective learning situation is one in which all the essential elements for promoting learning i.e. learners, teachers, subject matter, teaching materials & physical facilities relevant to a particular situation are present in a dynamic relationship with one another. The conditions under which effective learning can take place are presented by Leagans(1961).

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The following diagram is a symbolic representation of the reaction the learner makes to the other four elements and the way these five elements react to each other.

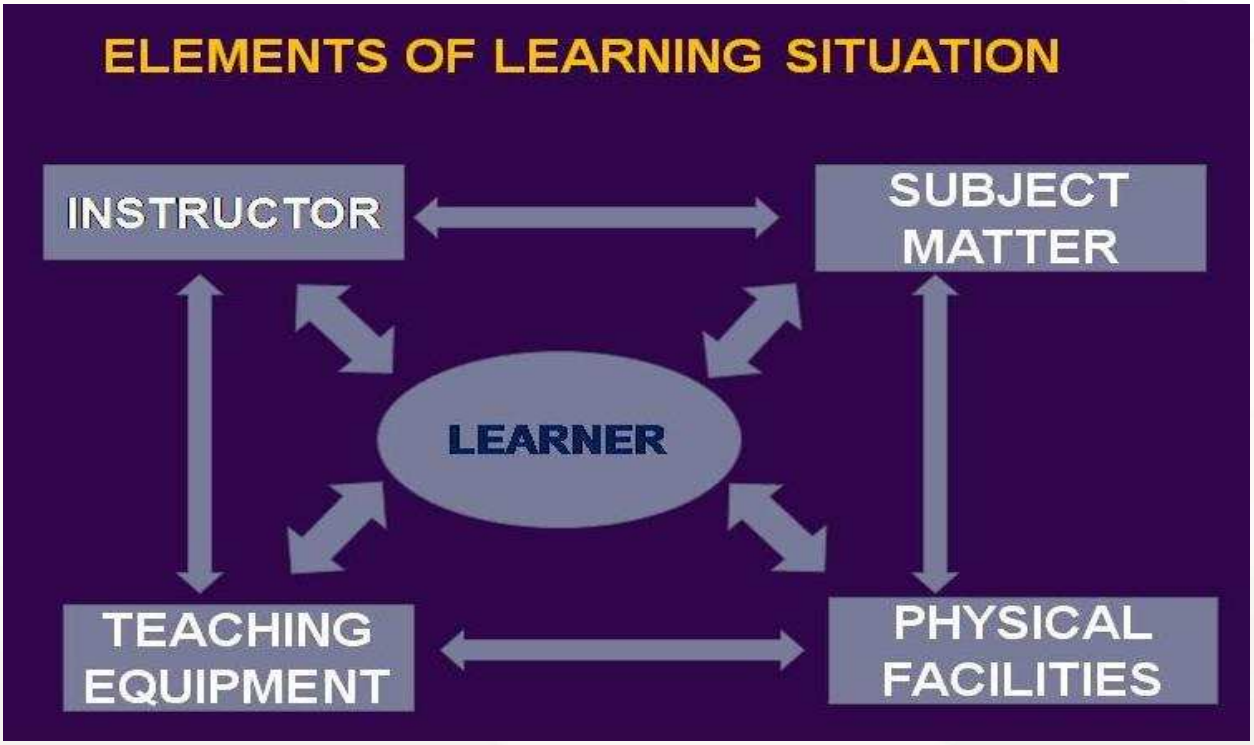

Fig 10.3 The 5 elements of a learning situation

Criteria for effective learning situation or Characteristics of the elements of learning situation: To have an effective learning situation these five major elements should satisfy the following conditions or characteristics

1. Instructor should:

a. Have clear objective

b. Know the subject matter and have it well organized

c. Be enthusiastic and interested in the subject

d. Be able to communicate with learners

e. Be democratic in his leadership

f. Allow student participation, ask for it

g. Be prepared, be prompt, be friendly, be courteous

h. Use teaching plan

i. Speak so that all can hear

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j. Set a good example of a good leader and teacher
k. Be skillful in the use of teaching materials and equipment
In the present context, the farmers, farm women & rural youth comprise the learners.
Ex; the assistant horticultural officer, extension personnel are the instructor whereas horticultural farmers who need to increase vegetable production are the learners.

2. Learner should:

a. Have need for information
b. Be interested
c. Be capable of learning
d. Use the information gained

3. Subject matter or content:

a. Pertinent (related) to learner's needs
b. Applicable to real life situations
c. Taught at intellectual level of learners
d. Well organized – logically presented
e. Presented clearly
f. Challenging, satisfying and significant to the learners
g. Fits into overall objectives
For example: The subject matter is increasing brinjal, tomato, potato, pumpkin etc production

4. Teaching materials: These are appropriate instructional materials, equipments & aids. The teaching materials should be-

a) Suitable to the subject matter & physical situation
b) Adequate in quantity & available in time
c) Skillfully used
Example: Teaching materials like improved hybrid, HYVs and seeds/ varieties suitable for the area, herbicides, audio-visual aids relevant to the topic.

5. Physical Facilities:

a. Free from outside distractions
b. Temperature as comfortable as possible

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c. Well lighted
d. Adequate space for the group
e. Furniture comfortable and well arranged
Example; Physical facilities may include facilities for hybrid seed & insecticide, herbicide, Suitable land, irrigation,
A place which is easily accessible, free from outside distractions, adequate seating arrangements, electricity for projection etc for conducting training program.

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Course Name	Fundamentals of Extension Education
Lesson 11	Programming Planning Process: Meaning, Principles and Steps
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
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11.1 Objectives of the Lesson

- To understand the meaning of various concepts in extension programme planning
- To explore the objectives and rationale of having an extension programme
- To analyse the principles underlying extension programme planning
- To identify and understand the steps involved in extension programme planning

11.2 Glossary

Programme is a statement of situation, objectives, problems and solutions.

Planning is designing a course of action to achieve ends.

Programme planning is the process of making decisions about the direction & intensity of extension education efforts of extension-service to bring about social, economic & technological changes.

Extension Programme planning is the process of making decisions about the direction and intensity of extension education efforts of extension-service to bring about social, economic and technological changes.

Need is the difference between "what is" and "what ought to be"

Objectives are expressions of ends towards which our efforts are directed.

Plan of work is an outline of activities so arranged as to enable efficient execution of the entire programme.

Calendar of work is a plan of activities to be undertaken in a particular time sequence.

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11.3 Meaning of various concepts in extension programme planning

Programme development and effective implementation is the key function of extension personnel at various levels with people participation. Pragramme planning process is a serious of continuous coordinating process which includes various concepts for the extension programme planning.

11.3.1 Concept of Extension programme:

The word 'programme' has several distinct meanings in the dictionary. It means a proclamation, a prospectus, a list of events, a plan of procedure, a course of action prepared or announced beforehand, a logical sequence of operations to be performed in solving a problem. When used by an organization, it means a prospectus or a statement issued to promote understanding and interest in an enterprise.

According to Kelsey and Hearne (1967) “an Extension programme is a statement of situation, objectives, problems, and solutions. It is relatively permanent but requires constant revision”. It forms the basis for extension plans. Eg: block development plans prepared by block technology teams of ATMA.

Leagans (1961) says ‘An extension programme is a set of clearly defined, consciously conceived educational objectives derived from an adequate analysis of the situation, which are to be achieved through extension teaching.

According to the USDA (1956), an "extension programme" is arrived at co-operatively by the local people and the extension staff and includes a statement of:

- The situation in which the people are located;
- The problems that are a part of the local situation;
- The objectives and goals of the local people in relation to these problems; and

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- The recommendations or solutions to reach these objectives on a long-time basis (may be several years) or on a short-time basis (may be one year or less).

Lawrence (1962) says that an "extension programme" is the sum total of all the activities and undertakings of a county extension services. It includes: (i) programme planning process; (ii) written programme statement; (iii) plan of work; (iv) programme execution; (v) results; and (vi) evaluation.

From the above definitions, it is clear that an extension programme:

- Is a written statement;
- Is the end product of extension programme planning;
- Includes a statement of situation, objectives, problems and solutions;
- Is relatively permanent but requires constant revision;
- May include long-term as well as short-term programme objectives;
- Forms the basis of extension teaching plans;
- Has been drawn up in advance; and
- Has been built on the basis of content.

So, we can define an extension programme as a written statement of situation, objectives, problems and solutions which has been prepared on the basis of an adequate and systematic planning effort and which forms the basis of extension teaching activities in a specific area, for a given period.

The function of extension programme is to provide a clear guide, a blueprint, or a plan useful to extension worker in conducting ongoing extension programmes.

Extension programme projection can be defined as an administratively realistic form of long-range development involving the scientific approach in assembling facts as the basis for intelligent decision making by a broadly representative group of local people - National Task Force, USA.

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11.3.2 Meaning of Planning:

1. The meaning of planning is to solve the problems by using the available resources, and for it, to make necessary policy and to work for achieving the goal.

2. Planning is a process which involves studying the past and present in order to forecast the future and in the light of that forecast determining the goals to be achieved and what must be done to reach them.

3. Planning is to make efforts to solve the problems permanently, which can be achieved through co-operative efforts, means and aims. The effective planning is that in which the maximum number of objectives are fulfilled.

4. Planning is designing a course of action to achieve ends

The basic concept of planing appears to be well accepted in our culture. It is regarded as an integral and important dimension of our culture's rational value orientation. Rational value orientation assumes a conscious systematic approach to problem solving, i.e., problem definition, data gathering and choosing between alternative ends and means on the basis of predetermined criteria.

Almost everyone accepts the premise that planning is important and necessary for individuals, for families and for business organizations. The most effective planning effort would be that 'which achieves the greatest degree of performance of the actions, motions or operations implied by a set of planning concepts which depict the ideal process (Boyle, 1965).

11.3.3 Meaning of Programme Planning:

It is a decision making process involving critical analysis of the existing situation and the problems, evaluation of various alternatives to solve these problems and the selection of the relevant ones, giving necessary priorities based upon local needs and resources by the cooperative efforts of the people both official

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and non-official with a view to facilitate the individual and community growth and development.

Programme Planning is a process of working with people in an effort to recognize the unsatisfactory situation and determine possible solutions or objectives or goals

It is obvious from all the definitions that programme planning is the knowledge of present situations, its analysis to identify the problems, to put in the sequence according to needs, to determine the objectives, to find out the scientific solution, and to determine the activities for the selected work and where, when and by whom it should be done.

11.3.4 Extension Programme Planning

Extension Programme planning is the process of bringing about desirable and planned change. It is a deliberate and collaborative process involving change agent and client-systems viz; farmers, farm women, rural youth, which are brought together to solve a problem, or more generally, to plan and attain an improved state of functioning in the client system by utilizing and applying valid knowledge.

It is the process of analyzing existing situation, problems critically finding out solutions these problems, prioritizing and selecting the relevant solutions based on local needs and resources and finally preparing a written statement indicating the situation, objectives, problems and solutions with cooperation from all the stakeholders.

The programme development process has been defined as a continuous and cooperative activity involving lay people and the Extension staff, in which problems are identified, objectives are set forth and action is taken to reach the objectives".

The function of extension programme planning is to provide a clear guide – a blue print or a plan useful to extension workers in conducting an ongoing

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educational programme. A well-developed programme is to the extension worker what a compass is to the seaman.

Programme planning is the process whereby the people in the country through their leaders plans their extension programme, country and state professional extension staff member assist in this process (Lawrence,1962).

The first step in any systematic attempt to promote rural development is to prepare useful programmes based on people's needs. The development of such programmes, which harmonize with the local needs as the people see them and with the national interests with which the country as a whole is concerned, is an important responsibility of extension personnel at all levels- national, state, district, block & village.

Extension Programme planning is the process of making decisions about the direction & intensity of extension education efforts of extension-service to bring about social, economic & technological changes. Programme planning is viewed as a process through which representatives of the people are intensively involved with extension personnel and other professional people in four activities (Boyle, 1965):

- Studying facts and trends;
- Identifying problems and opportunities based on these facts and trends;
- Making decisions about problems and opportunities that should be given priority; and
- Establishing the objectives or recommendations for future economic and social development of a community through educational programmes.

Extension programme planning is the process of determining, developing and executing programmes. It is a continuous process, whereby farm people, with the guidance and leadership of extension personnel, attempt to determine, analyse and solve local problems. In this, there are three characteristics:

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- What needs to be done;
- When it should be done; and
- How it should be done (Musgraw, 1962).

11.4.5 Other important related concepts:

Need is what one desires. It is lack of something. Need is the difference between "what is" and "what ought to be". The Characteristics and types of need are as following.

- Expressed in terms of behaviour in a particular direction.
- Periodical or sporadic. At times, they are very active and actually felt. At other times, not so active; often dormant.
- Often interrelated (They seldom operate singly. Usually expressed in groups).
- Needs often conflict with one another, and this sets up priorities. e.g., drowning man forgets all other needs except the need for air.

The people's needs usually can be classified into two categories:

Felt needs or recognized needs are those existences the people are aware and feel necessity of fulfilling them. Example of felt needs: Low yields in cauliflower - due to low yielding varieties, pest and diseases

Unfelt needs or unrecognized needs are those whose necessities the people don't realize at present, but these none the less are important. Examples of unfelt needs: low yields in Medicinal plant- Soil salinity problem, water shortage at maximum tillering stage

Interest: Interest may be defined as a desire on the part of an individual to learn study or gain more information and skill about some field or subject matter that he thinks of value to him.

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Aims are generalized and broad statements of directions with respect to given activities. E.g: Extension Worker's aim is to improve farmers' economic condition.

Objectives are expressions of ends towards which our efforts are directed .E.g: To increase paddy yield by 40%

Goal is the distance in any given direction one expects to go during a given period of time. E.g: To increase Paddy yield by 20 Q/ha in the current year.

Project is an outline of procedure and pertains only to some phase of extension work. Project is a specification of work to be done or procedure to be followed in order to accomplish a particular objective.

Programme development process is defined as a continuous and cooperative activity involving lay people and the extension staff in which problems are identified, objective are set forth and action is taken to reach the objectives – 'Sanders '.

Plan is a predetermined course of action. Plans may be tailored to specific projects, or they may be established as standing plans (ex. Five Year Plans) for future actions. Planning not only involves predetermining a course of action to be taken, but also includes mentally searching for possibilities of future problems that might appear.

Plan of work is an outline of activities so arranged as to enable efficient execution of the programme. It is a statement of activities to be undertaken by an individual, a group of people or an organization, within a definitely stated time, to carry out the recommendations in the programme. The plan of work indicates

- what is to be done?
- who is to do it?
- how it is to be done?
- when it is to be done?

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- who are to be served or reached? and
- how the results will be measured?

Situation is a brief statement of the more general factual information together with the needs and desires of the people.

Problem is a condition that the people after study, with or without help have decided needs changing

Solution is a course of proposed action to change an unsatisfactory condition to one that is more satisfying

Calendar of work is a plan of work arranged chronologically.

11.4 Features of Extension Programme Planning

Extension programme planning is multistage, multifaceted, dynamic and contimuos educational process. i t includes various concept and key characteristics to visualize the objectives of the extension programme.

1. Extension programme planning is a process:

The dictionary meaning of 'process' is 'any phenomenon which shows a continuous change in time' or 'any continuous operation or treatment'. If we accept this concept of process, we view events and relationships as dynamic, ongoing, ever-changing and continuous.

When we label something as a process, we also mean that it does not have a beginning, an end, a fixed sequence of events. It is not static, at rest. The basis for the concept of process is the belief that man cannot discover the structure of physically reality; man must create it.

This definition of process suggests that 'a process is involved in which a series of actions culminates in the accomplishment of a goal' (Boyle, 1965). Viewed in this way, the concept of process involves a method, i.e., a process should be viewed as a sequential set of steps or several systematically ordered steps of

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planning, the performance of which leads to the accomplishment of a goal. In extension programme planning, the immediate goal would be the development of a programme document.

The concept a person has of the extension programme planning process will affect actions and mode of researching the process. Many programme-planning processes take place at any particular time at different levels of the extension organization.

For example, programme planning occurs at the national level (five-year plans), at the state level (state plans, annual plans of work) and at the block level. In fact, planning at the block level is taking place when:

•The long-time plan or projected plan is being developed;

•The schematic budget is being planned;

•The annual plan of work is being developed;

•Detailed plans for individual learning experiences are developed with a major project.

2. Extension programme planning is a decision-making process.

Planning is basically a decision-making process- and so is extension programme planning. In extension programme planning, scientific facts are put to value judgements of the people through the implementation of a rational planning model in order to decide a programme which will be carried out through the extension teaching activities.

3. Extension programme planning requires advance thinking:

If we could know 'where we are' and 'where we are to go' we could better judge 'what to do' and 'how to do'. This statement lies at the heart of the nature of planning. Panning does not take place in a vacuum or automatically. It has to be made to happen.

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The most basic fact giving rise to planning is that effective rural development result from choice, not from chance; it results from design, not from drift. Good extension programme planning is an intellectual activity since it usually involves a study and use of facts and principles. It requires knowledge, imagination and reasoning ability.

It is a complex exercise as it involves people their needs, their interests, useful technology, educational process, analyzing a situation and making decision about what should be done, determining useful actions, projecting the desired shape of things in future and several other components, which are rarely simple.

4. Extension programme planning requires skill and ability on the part of planners:

Planning effective extension education programmes requires a number of high-level professional skills. Needed abilities include understanding and skill in the following broad areas:

- Understanding the nature and role of extension education organization.
- Knowledge and understanding of the technology related to the subject with which the programme is concerned.
- Ability to clarify the objectives of a programme and to so state them that they are useful in guiding its execution.
- Skill at seeing the relationship between principles and practice.
- Skill at inquiry and human relationships.

5. Extension programme planning is built round content:

A programme regarding any extension activity can only be built on the basis of content. Without some express purpose, there can be no planning. Extension programme planning is built around available improved technology, the people, their resources, problems, needs and interests.

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6. Extension programme planning is a social action process:

Extension programme planning involves interaction and the decisions so taken in the form of a programme affect others. Interaction assumes some type of communication between two or more people in the planning process. So when the extension staff involving specialists and people's representatives decides on the programme content for extension teaching for the coming year, it is involved in social planning.

In this process, the scientific data is put to value judgements so as to decide the intended direction of change and also the appropriate methods to be used to reach these goals.

Further, the resultant programme has many social consequences in terms of interaction with other people, e.g., to inform them, educate them, persuade them, in order to introduce improved technology into their minds and actions.

7. Extension programme planning is a collaborative effort:

Extension programme planning is a collaborative effort involving identification, assessment, evaluation of needs, problems, resources, priorities and solutions.

8. Extension programme planning is a system:

Extension programme planning is a system as its procedures and processes are interrelated, ordered and linked progressively to form a collective whole. It includes several subprocesses, such as planning, designing, implementing, evaluation etc.

9. The end-product of extension programme planning is an extension programme:

The first consideration for anyone who is to concern himself with a process or set of procedures for planning is to clearly identify the primary purpose of the

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planning process to be developed. Many have suggested that the purpose of planning is for educating those who participate.

According to Vanderberg (1965), 'the primary purpose of any planning, first and foremost is that of developing a sound, defensible and progressive course of action or plan. In the process followed, many other benefits might accrue, such as the education of participants, but we want a plan which can and will be used'.

11.5 Objectives of extension programme

The general objective of having an extension programme is to influence people to make changes in their way of life and making a living. The assumption is that there is a need for change and if people are not aware, it is necessary to make them aware of this; and to develop their needs. According to Kelsey and Hearne (1967), the following are reasons for having a programme:

- To ensure careful consideration of what is to be done and why.
- To furnish a guide against which to judge all new proposals.
- To establish objectives toward which progress can be measured and evaluated.
- To have a means of choosing the important (deep rooted) from incidental (less important) problems; and the permanent from the temporary changes.
- To develop a common understanding about the means and ends between functionaries and organizations.
- To ensure continuity during changes of personnel.
- To help develop leadership.
- To avoid wastage of time & money and promote efficiency.
- To justify expenditure and to ensure flow of funds.
- To have a statement in written form for public use.

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11.6 Rationale of programme planning

1. Progress requires a design: Effective education is results of design not drift; it results from a plan-not from trial and error. The experience of workers in education and in other educational agencies has been that progress is made most effectively when a plan of action is set forth and followed.

The pay-off for educational effort comes when people change their behaviour to improve their situation. These results come most rapidly when careful planning is done and when effective teaching methods are used.

2. Planning gives direction: There are no tests for directing the people's learning in extension. This argument the difficulty of designing a plan and underscores the fact that planning is one of the most important jobs of extension workers.

In planning or constructing a course of study, the teacher should be guided by five major factors: (1) the purpose for which the course is offered, its aims; (2) the characteristics and needs of those who are to take the course; (3) the educational environment of these persons; (4) the sources of information available; and (5) the requirements or demands of the vocation or other uses to which the learning is to be put.

These factors apply to the development of extension programmes as well as to the curriculum of the public schools. The factors that apply to the study of a situation will be considered more closely a little later.

3. Effective learning requires a plan: There must be consciously directed effort on the part of the teacher to give guidance to the learning process. The direction of this teaching effort can best be stated in terms of objectives. They must be developed with the people to be taught and must be capable of attainment by and with the people concerned.

4. Planning precedes action: The results of an action are dependent on the following: adequacy of analysis of the problems, situation of objectives and

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involvement of the people. Through the planning process, questions such as these are posed:

i. What information do farm men and women need most?

ii. Which kind of information shall be extended?

iii. What information shall be extended first?

iv. How much time shall be devoted to this line of work?

v. How much effort shall be devoted to this line of work?

The answers to these questions lie in the programme planning process.

Kelsey and Hearne (1949) have given the following rationale for a planned extension programme. According to them, sound extension programme planning:

1. is based on analysis of the facts in the situation

2. selects problems based on needs

3. determines objectives and solutions which offer satisfaction

4. reflects performance with flexibility

5. incorporate balance with emphasis

6. envisages a definite plan of work

7. is a continuous process

8. is a teaching process

9. is a coordinating process

10. involves local people and their institutions; and

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11. provides for evaluation of results

Thus it could be said that planning programmes is an integral part of the development process and ensures better and efficient utilization of resources, accountability and human development.

11.7 Principles of extension programme planning

After a critical analysis of the programme planning principles available in extension literature, Sandhu (1965) identified a set of principles that may be applicable in developing countries.

1. Sound programme building is based on the analysis of the facts in the situation: to be effective every programme must start with the people and situation as they are and then build towards the ultimate goal of better living.

It is important to take in to account all the facts concerning the people, the land, the community, the institutions, the organizations and the agencies operating in the area. Factual material is obtained through block staff, district staff available through local institutions like Panchayat, school, cooperative societies, youth club etc.

2. Sound programme planning selects "Problems based on needs: All the problems cannot be attacked once. It is necessary to select that most urgent concern. Choice of the problems must be among those brought out by the analysis of facts regarding what are felt and unfelt needs.

To be effective extension work must begin with the interests of the people. Problems should be related to family, community and block situations. The problem should be arrived at democratically through participation of people, extension staff and others who can contribute to programme

3. Good programme building determines objectives and solutions, which offer satisfaction: In order to hold interest, the workers, must set specific

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objectives for whom they are intended should understand solutions, which are within reach and will give the satisfaction of achievement of objectives.

They should be agreed upon by the people and be attainable and they should be stated in terms that can be measured. Objectives which are determined by extension worker should be made clear to the people

4. A good programme has permanence with flexibility: A good programme should be permanent. Without flexibility, the programme cannot meet the needs of the people. It has been found that particular items need to be changed to meet important emergencies.

A programme should be prepared well in advance of its execution but not too far ahead of time. Ordinary events may be subjected to change in part though not in total. Programmes should meet long term and short term changes to meet special emergencies

5. A sound programme has balance with emphasis: A good programme should cover the majority of their important interests. It must be comprehensive enough to embrace all the groups and all problems of family, village, block and district.

It is futile to deal with one phase of life in a community as an end itself. At the sanction a few of the most important or timely problems should be chosen for emphasis

6. A good programme has a definite plan of work: No matter how well the programme is sorted out it is of no use unless carried out. This implies good organization and careful planning of action.

A plan of work is answer to what, where, when and how the job will be done. It also includes part to be played by extension worker, part played by agencies and plans for measuring results

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7. Programme building is a continuous process: It is never finished. The situation changes through economic and social trends through actions of people, problems change, emphasis change and phases may be completed and new problems may arise and needs new solutions and new programmes

8. Programme building is a teaching process: The process of programme building itself an excellent teaching device. It teaches people to think, to reason, make decisions, and act through participation. It is time consuming but good investment

9. Programme is a coordinating process: Programme planning process find out the most important problems and seeks agreement on definite objectives. It obtains cooperation of many people and coordinates the efforts of leaders, groups, agencies and promotes the best use of all resources

10. Programme planning provides opportunity for evaluation of results: All attempts at evaluating extension work are dependent on clear objectives and records of results in terms of which changes in the action of the people are shown.

11.8 Steps in extension Programme Planning Process

The programme development process is on-going and continuous which involves various steps: analyzing the situation or context; setting objectives and; designing an action plan; implementing the plan; evaluating inputs, outputs, outcomes, and reconsider the weak and strong points of the programme.

The principles and key features of extension programme planning shall help us to develop the eight logical steps which form a continuous cycle of programme determination and programme implementation in extension

Each educational initiative, workshop or event we carry out modifies the initial situation. As a consequence, any plan of action continues to evolve and change as the situation or context changes.

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The preparation, execution and evaluation of the extension programme involves the following steps

- Collection of facts
- Analysis of situation
- Identification of problems
- Determination of objectives and goals
- Developing plan of work and calender of operations
- Following through plan of work and calender of operations
- Evaluation of progress
- Reconsideration and revision of the programme

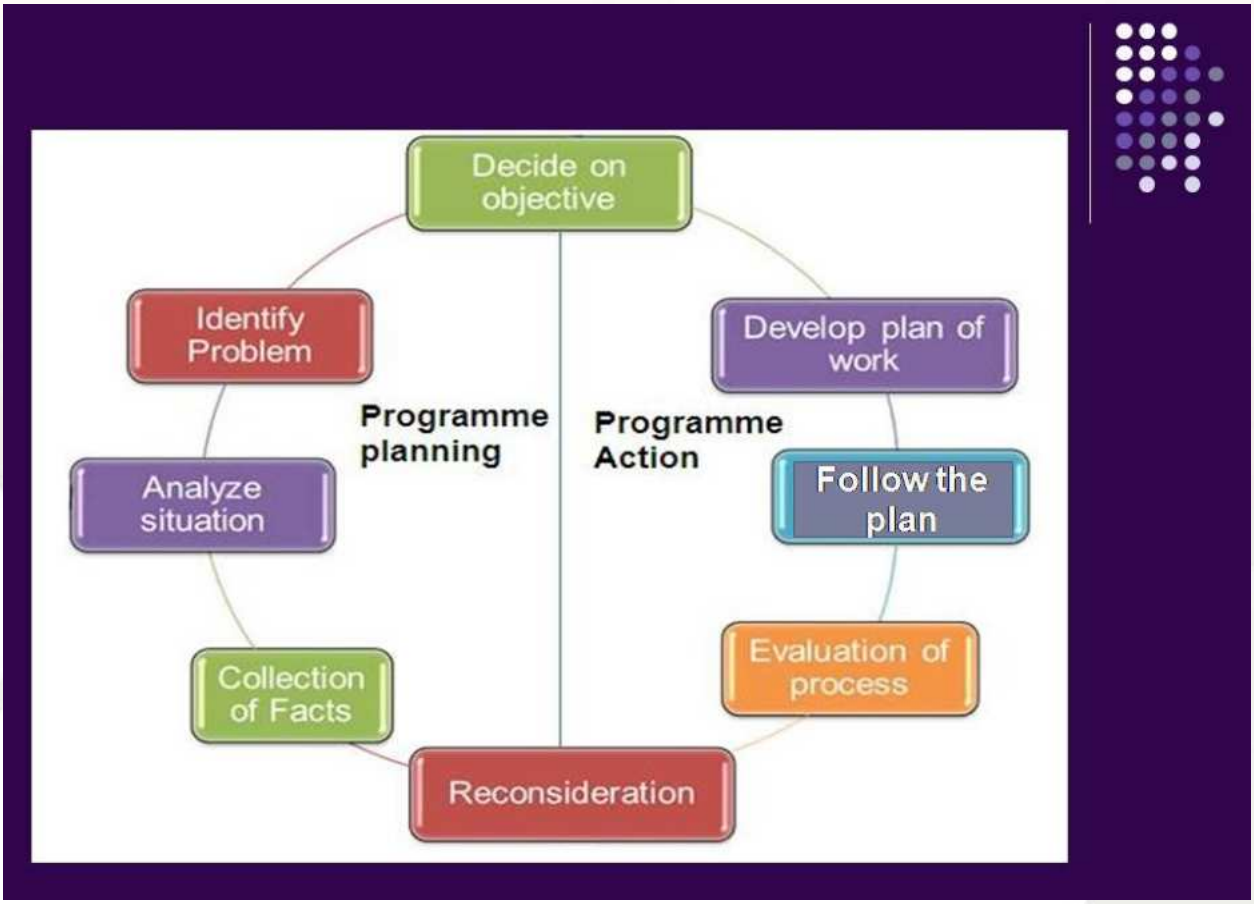

Fig. 11.1 Steps of extension programme planning

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11.8.1 Collection of facts

Sound plans are based on availability of relevant & reliable facts. This includes facts about the village people, physical conditions, existing farm & home practices, trends & outlook. Besides, other facts about customs, traditions, rural institutions, peoples' organisations operating in the area, etc. should be collected.

The tools & techniques for collecting data include systematic observations, a questionnaire, interviews & surveys, existing governmental records, census reports, reports of the district planning and statistics, and the past experiences of people.

For example, a survey and PRA tools was conducted to develop the extension programme for marginalized poor farmers in the village collecting various information. Information from panchyats, key informants, lay leaders, gram sathi also collected.

11.8.2 Analysis of the situation

After collecting facts, they are analysed and interpreted to find out the problems & needs of the people. The various dimension need to considered while analyzing the situation.

11.8.3 Identification of problems

Problem identification of the village and farmers through proper anlaysis and interpretation of data shall help to priritise the problem and identify the most important problem. As a result of the analysis of facts, the important problems are identified and the problems leading to such a situation are located.

These problems are identified based on their available resources and as perceived and felt need of that situation.

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For example, there may be several problems but only the urgent problem based on their significant need and interest may be identified like low level of income of the vegetable farmer due lack of market.

11.8.4 Determination of objectives

Once the needs & problems of the people have been identified, they are stated in terms of objectives & goals. The objectives represent a forecast of the changes in the behaviour of the people and the situation to be brought about. The objectives may be long-term as well as short-term, and must be stated clearly.

The stated objectives should be clearly achievable and realistic. The objectives should be such that they can be evaluated.

For example, to increase the farmer's income the market led extension or creation of farmer producer organization which act as linkage between farmer and market.

11.8.5 Developing the plan of work

In order to achieve the stated objectives & goals, the means & methods attaining each objective are selected; and the action plan, i.e. the calendar of activities is developed. It includes the technical content, who should do what, and the time-limit within the work will be completed. The plan of work may be seasonal, short-term, annual or long-term.

The calendar of work shall be prepared based on the plan of work and specify the when a particular work to be done with suitable date and time considering the resources available. Develop the plan of work considering various stakeholders involved in the programme like extension personnel, marketing personnel, farmer, association etc.

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11.8.6 Follow up the plan of work and calendar of operation

Once the action plan has been developed, arrangement for supplying the necessary inputs, credits, teaching aids, extension literature etc. has to be made and the specific action has to be initiated. The execution of the plan of work is to be done through extension methods for stimulating individuals and groups to think, act and participate effectively. People should be involved at every step to ensure the success of the programme.

11.8.7 Evaluation

It is done to measure the degree of success of the programme in terms of the objectives & goals set forth. This is basically done to determine the changes in the behaviour of the people as a result of the extension programme.

The evaluation is done not only of the physical achievements but also of the methods & techniques used and of the other steps in the programme planning process, so that the strong & weak points may be identified and necessary changes may be incorporated accordingly.

11.8.8 Reconsideration

The systematic and periodic evaluation of the programme will reveal the weak and strong points of the programme. Based on these points, the programme is reconsidered and the necessary adjustments & changes are made in order to make it more meaningful & sound.

Programme planning is not the end-product of extension activities, but it is an educational tool for helping people to identify their own problems and make timely & judicious decisions. From the above mentioned cycle, it is clear that the planning of an extension programme comprises a logical series of consecutive steps.

The first four steps form the programme determination phase. The steps five to seven form the action phase. The step eight, i.e. reconsideration, joins the

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two phases together, where it leads to the fact-collecting step, thus beginning once more the never ending or continuous process of planning the extension programme.

If it is found that the desire result and targeted objectives has not achieved the extension workers involved may find the issues or the objectives may reframed considering the various factors. Extension programme planning is the major objective of extension agent to materialize the goal and objective of the farmer.

11.9 Role of Extension Agencies in Programme Implementation

Different roles performed by the extension agencies during programme implementation include:

- Help the target beneficiaries to become aware of their needs and change their behaviour, bringing about a change in their knowledge, attitude, skills and abilities.
- The different extension agents involved in improving the rural conditions helps to build a good rapport amongst the clients. The clients must accept the extension agent and his credibility before they accept the innovations promoted by them. Good environment building helps in easing the process of programme implementation.
- Assemble, relate and analyze all factual information collected.
- Help people to diagnose their problems and decide which needs immediate solution.
- Motivate the clients to mentally accept the change being introduced.
- Assist the clients to implement the recommendations or solutions and emphasize on getting action of the clients on proposed solution.
- To develop complete procedures and train staff as well as villagers.
- Help to stabilize change and prevent discontinuance of the new behaviours by convincing through reinforcing messages to the clients who have adopted the new practice.

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- To strive for larger participation by the people and coordinate all efforts and resources of other agencies.
- Help to develop leadership among various sectors of the rural community.
- Help to transmit information based on agricultural research and applied experience.
- To keep research workers constantly informed about the problems at rural level to offer solutions based on further research in specific area concerned.
- These agencies help to set up a feedback process to known the problems arising for further implements.
- Help in providing inputs like seeds, fertilizers, raw materials, implements and may others to the target group and also the method of using it.
- Work with rural people through non-formal education and also involving their participation for anchoring community development covering several activities like agriculture, animal husbandry, fisheries, forestry and may other allied activities.
- Help in disseminating the latest technologies to rural people and communicate back the information on adoption of new techniques and improved practices in various sectors

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Course Name	Fundamentals of Extension Education
Lesson 12	Evaluation: Meaning, Importance and Methods
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
University Name	Kerala Agricultural University, Thrissur

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12.1 Objectives of the Lesson

- To understand the concepts, principles and purpose of monitoring in extension
- To find out the concepts, types and various degree of evaluation
- To explore the objectives and importance of evaluation
- To identify and understand the criteria and steps in effective evaluation

12.2 Glossary

Monitoring simply means to keep a watch on what is happening

Evaluation is the process of determining the extent to which objectives have been attained

Process evaluation is on documenting and analyzing the manner in which programmes work in action

Self-evaluation is the judgment that is to be carried out by every worker as a matter of routine practice.

Ex-post evaluation is done to review comprehensively the experience and impact of a project conducted

Formative Evaluation is done to monitor the progress during programme implementation.

Summative Evaluation refers to the evaluation which is conducted after completion of programme.

12.3 Concepts of monitoring and evaluation

Monitoring always play important role to judge the effectiveness, efficiency and worth of the programme, adoption and extension activities. Monitoring and evaluation of the programmes play a key role in implementation and hence help to determine the results and impact of its intervention on the target beneficiaries. It helps to know whether the programmes have led to –

- An increased income and consumption

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- Expanded access of people to basic services
- Created better living conditions for the rural folks

Monitoring and evaluation are two inter related processes that are used to guide decision-makers about how programmes should be carried out to achieve the desired results and benefits. The four important concepts which are basic to monitoring and evaluation are –

1. Capability: refers in terms of physical, financial and human resources, which are being used by the client group of the programme. Extension performance depends directly upon its capability.

2. Effectiveness: is defined as "the degree to which goals are attained". Among the different extension goals such as social goals (rural welfare), economic goals (increased income) and many others, the operational goals like physical and financial are of special significance, because with this, other goals are also easily achieved.

3. Efficiency: refers to the speed at which the client group is adopting the recommended practices.

4. Impact: after measuring different indicators, the results obtained help to determine the success and failure of programmes.

12.3.1 Meaning and definition of monitoring

Monitoring simply means to keep a watch on what is happening. The word "monitor" is derived from the latin word meaning to "warn". The monitoring can be understood in following ways:

Monitoring is referred to as a systematic and routine gathering of data, observation and documentation of the progress of programme implementation based on the programme plan. Essentially monitoring deals with comparing actual accomplishments with planned targets and provides prompt information about the status of the programmes.

This helps to make an assessment and take timely decisions in corporate corrections to keep implementation on the right direction.

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Monitoring is a continuous or periodic review by management at every level of the hierarchy of the implementation of an activity to ensure that input deliveries, work schedules, targeted outputs and other required actions are going according to the plan.

The basic objective of monitoring is to keep all concerned with the programme activities as planned and if there is any deviation then correct it timely. In other words, monitoring can be described as a regular observation and recording of activities taking place in a programme and helps to keep a check on how programme activities are going on.

Monitoring also involves giving feedback about the progress of an ongoing programme to the beneficiaries and implementers.

Cernea and Tepping defined monitoring as "It is the gathering of information on utilization of project inputs, on unfolding of project activities, on timely generation of project outputs and on circumstances that are critical to the effective implementation of the project".

Monitoring is an ongoing continuous exercise

The monitoring unit should include technical personnel having specialized skills. The staff often consists of extension specialists, economists, sociologist or anthropologists, statisticians, computer programmers and supporting staff. The head of the monitoring unit may come from any of these disciplines. The number of staff can be according to requirement for work accomplishments. The leader of the monitoring unit should report to one of the top managers in the organization.

Monitoring Indicators help to measure changes in a given situation. These are tools for monitoring and evaluating the effects of an activity, by which a monitoring unit keeps track of extension programme's capability, effectiveness and efficiency. Indicators are developed using two approaches:

1. Indicators developed on the basis of available statistics.

2. Indicators developed on the basis of areas of interest.

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For monitoring indicators are of 2 types – (1) Process indicators, (2) Impact indicators

There are qualitative / quantitative indicators. Qualitative indicators use proxy indicators

e.g. for measuring leadership ask 2-3 questions indirectly to assess it like how many women can take decision, how many can lead a group on her own, how many women can handle crisis situation.

Quantitative indicators deal with numerical values. They are easy to measure. Qualitative indicators assess changes in knowledge, attitude, behaviour and practices at individual, family, community levels.

12.3.2 Meaning and definition of evaluation

Educational evaluation became a part of extension education that judge the effectiveness of programme, appropriation of public funds and strengths and weakness of the objectives determined.

The word 'evaluation' has its origin in the Latin word "valere" meaning to be strong or valiant. Its dictionary meanings are the determination of the value, the strength or worth of something, an appraisal, an estimate of the force of or making a judgement of something.

Evaluation as applied to the field of extension education, may be defined as "a process of systematic appraisal by which we determine the value, worth or meaning of an activity or an enterprise". It is a method for determining how far an activity has progressed and how much further it should be carried to accomplish objectives'.

Thus to an extension worker evaluation means determining the results of his extension programmes in order to know the extent to which objectives have been achieved and why and what changes would be needed in case the programme is planned again, or in its implementation.

Tyler (1950) developed two basic notions regarding educational evaluation, which equally apply to extension evaluation. These notions are that the process of

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evaluation (i) is essentially a process of determining behaviour of the people covered under the programme and (ii) the process of determining the degree to which these behavioural changes are actually taking place. Thus extension evaluation may be said to be a process for determining behavioural changes of people resulting from extension programmes.

Definitions of Evaluation

It is a process, which enables the administrator to describe the effects of his programme and thereby make progressive adjustments in order to reach his goal more effectively (Jahoda and Barnit, 1955).

Programme evaluation is the determination of the extent to which the desired objectives have been attained or the amount of movement that has been made in the desired direction (Boyle and Johns, 1970).

Programme evaluation is the process of judging the worth or value of a programme. The judgement is formed by comparing the programme should be (Steele, 1970).

Evaluation is the process of delineating, obtaining and providing useful information for judging decision alternative (Stufflebeam, 1971).

Evaluation is a co-ordinated process carried on by the total system and its individual subsystem. It consists of making judgements about a planned programme based on established criteria and known, observable evidence (Boone, 1985).

Comparison between monitoring and evaluation

Parameters	MONITORING	EVALUATION
Meaning	Monitoring refers to a routine process that examines the activities and progress of the project and also identifies bottlenecks during the process.	Evaluation is a sporadic activity that is used to draw conclusion regarding the relevance and effectiveness of the project or program.

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Parameters	MONITORING	EVALUATION
Related to	Observation	Judgement
Occurs at	Operational level	Business level
Process	Short term	Long term
Focuses on	Improving efficiency	Improving effectiveness
Conducted by	Internal Party	Internal or External Party

12.4 Purpose and Principles of monitoring

12.4.1 Purpose of monitoring

1. The important purpose of monitoring is to provide the information that the concerned authorities need, to know how efficiently the programme is running. If certain loopholes exist then corrective action can be taken quickly while the programme is going on.

2. The basic reason of monitoring is to record whether the scheduled visits are being made, appropriate recommendations are being given, farmers are adopting the improved practices, inputs are given on time and the like.

3. Monitoring provides information that will be useful in:

- Analysis of situation in the community and its programme.
- Ensuring that the programme inputs are well utilized.
- Identifying problems and their solutions in programme implementation.
- Ascertaining that the roles and responsibilities are carried out by the people in time.
- Determining, if the programme planned is the best way of reaching the objectives or requires some modifications.

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12.4.2 Principles of Monitoring

The effective monitoring process follows certain principles and criteria to systemic check up of the pragramme

1. Simple: Monitoring must be simple because a complex monitoring system in itself leads to failures. The basic concern of monitoring is to ease out the difficult situations arising in the on going programmes.

2. Timely: Monitoring must be done well in time as the management requires feedback from the monitoring system to take timely action. Efficiency of monitoring is also judged by its action well in time.

3. Relevant: Monitoring must be relevant which means that the emphasis is only on those aspects which are concerned with programme objectives and none of the information is gathered which is of no use by the management.

4. Information is dependable: Information provided through monitoring should be accurate and then only the management will depend on monitoring findings.

5. Participatory: Monitoring efforts should be participatory that is monitoring be equally conducted by all concerned with the programme-field level personnel, subject matter specialists, farmers etc.

6. Flexible: Monitoring must be flexible, not rigid and can be modified according to the situation.

7. Action oriented: Monitoring should lead to action, hence whatever information is collected; it should be put to use and not be of waste.

8. Cost effective: Monitoring efforts cost money and time; hence it needs to be cost effective. Computerization makes monitoring more cost effective by reducing staff hours in data processing.

9. Top management oriented: Monitoring efforts should be top management oriented, keeping in mind their requirements when designing and operating a monitoring system.

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10. Monitoring units represent specialized undertakings: like that of diagnosing problems and suggesting practical solutions, besides collection and analysis of data.

12.5 Objectives and importance of evaluation

12.5.1 Objectives of evaluation

These include –

- Assessment of progress and impact
- Exploring areas of success or failure
- Analysis of reasons for success or failure
- Ensuring acceptance of programme benefits by people and their reactions towards it
- Identifying areas of improvement in programme formulation and implementation

12.5.2 Importance of evaluation

The primary purpose of evaluation in any extension programme is to ensure the effectiveness of extension workers and further how the efficiency can be improved. The importance of evaluation is for the following purposes:

1. Programme Improvement: Any educational process which is evaluated, gives direction to continuous improvement in the programme process. Evaluations can help to improve the ongoing programmes. Information provided from evaluations conducted during programme implementation is used one to modify different stages of a programme.

2. Programme Accomplishments: The progress of any activity and finally the results achieved during the end of the programme are assessed through evaluation. It helps to determine how far an activity has progressed and how much further it should be carried to achieve the objectives. The strengths, weaknesses as well as objectives of a programme are also determined through evaluation.

3. Public Relations: Evaluation provides a report to the public. Assessment of programmes at the end via evaluation provides true information about the success and failure of the programme, which can be reported to the public, parliament

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and legislative bodies. The individuals, local leaders, professional groups, institutions and organizations in the community can be informed about the accomplishments of the programme through evaluation.

4. Professional Growth: Evaluation gives an index of the one's role as a professional worker. It helps to improve the professional attitudes and knowledge of extension workers and clarifies the shortcomings. Also feedback information from evaluations conducted can help to improve the morale of the extension staff. It helps to determine the capability of the local leaders in absence of extension workers.

5. Professional Security: Evaluation results give us information that leads to confidence, satisfaction and sense of achievements in oneself.

6. Effective Workmanship: Evaluation provides opportunity for different extension personnel to work together efficiently. It improves one's skill in working and coordinating with much people.

7. Methods of Extension Teaching: Evaluation keeps a check on extension teaching methods used. It helps us to know whether the extension teaching methods are being used effectively or not and which methods are most effective in what situation. The teaching methods used may be meetings, written materials, radio, demonstrations and others. Also the other devices or equipments used in the programme were in successful and which were in effective and needs to be modified to suit the changing needs of community.

8. Programme Planning: Evaluation gives a basis for judging the programme i.e. to judge the effectiveness of programme planning procedure, modifications required in programme planning procedures and role and responsibilities of individuals in planning. This also gives a guidance and direction for future programme planning.

9. Effectiveness of Extension Organization: Evaluation helps to determine the efficiency of organizational, administrative and supervisory roles performed. This helps to determine how effectively the administrators, organizers, specialists and

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supervisors involved in programme implementation can work systematically and efficiently.

10. Information of Clientele: Evaluation provides information about the people with whom we work like their needs, wants and interests.

- Individual differences within groups and between groups.
- Customs, values and taboos.
- Identification of the organizations most effective in the extension programme.
- Success of leadership in particular areas and identification of areas where more leadership is required.
- Segments and percent of the population reached by the extension staff.
- Identifying different extension approaches for different population segments.

11. Decision making: Evaluation helps to make judgments or draw conclusions that are of significance in decision making. Decisions may be regarding-need of a new valuable programme, continuation or reduction of the ongoing programme or re-emphasis of certain aspects of a programme.

12. Satisfaction: Evaluation provides satisfaction to planners, leaders and clientele through an understanding and appreciation of what is accomplished.

13. Impact:

i. Evaluation helps to assess the short term and long term impact of the extension programmes in social and economic terms.

ii. Helps in identifying areas of success or failure.

iii. Compares value of achievements of the programme with costs.

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12.5.3 Assumptions of Evaluation

1. The method used in programmes to bring about changes is educational, not compulsive.

2. Learning in the programme is expressed in changes of behaviour, skill, knowledge and attitudes.

3. Success of the programme must be measured by the extent to which educational changes are attained.

4. Evaluation is not the main purpose of a programme, hence the programme should not be burdened and diverted from its main task by excessive record keeping.

12.6 Types and degrees of evaluation

12.6.1 Evaluation can be classified into informal and formal evaluation according to casual everyday judgment

Informal evaluation is “casual everyday evaluations” and in opposite to this is “extensive formal studies” which represent formal evaluations.

Casual everyday evaluations can be equated with first impressions of a particular expressive. According to Fruitchey “They are the ones we ordinarily make without much consideration of the principles of evaluation in the decisions we make about simple problems”.

Informal evaluations are unsystematic, biased and also misleading. The criteria and evidence used in making judgments of this type of evaluation are implicit.

On the other hand, extensive formal studies make use of sophisticated research procedures and are often more systematic and helpful in making useful decisions about an extension programme. These studies are conducted by teams of evaluation specialists and are hence formal in nature.

Self evaluation

This is to be carried out by every worker as a matter of routine practice. This requires self-critical attitude through which the growth and professional

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competency of the extension workers is improved. The successes and failures of the individuals are evaluated by themselves. For instance, self evaluation through ordinary observations, talking with others, was getting other people's judgments etc.

12.6.2 According to the sources, evaluation is divided into 2 types

1. Internal evaluation: Internal evaluation can be done in different forms. This type of evaluation is conducted by the agency responsible for planning and implementation of the programme or by any appointed committee of workers who present details of accounts, project, loss and efficiency. Some other methods for internal evaluation include:

- Systematic use of diaries and reports of workers.
- Scheduled visits of staff members to the working spots.
- Usage of questionnaires and proformas for observation and enquiry.

E.g: performance appraisals, review committees in an organization etc.

2. External evaluation: When an external person, institution or development agency has done an evaluation work, it is called external evaluation.

E.g: Evaluation of ATMA project by EEI.

12.6.3 According to purpose for which we conduct evaluation - it are of two types i.e. formative and summative evaluations. This type of classification is given by Swanson.

Formative Evaluation

This is done to monitor the progress during programme implementation. It involves gathering information during early stages of the project, with a focus on determining whether the efforts are being directed as planned. This helps in smooth running of the programme.

Attempts to identify and solve the shortcomings during the developmental stages of a programme (i.e. programme execution) and provides early feedback on programme weaknesses and obstacles that have emerged, to modify the remaining programme stages for gaining success.

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Formative evaluation is a structured way to provide feedback on the work conducted by programme staff.

An example of formative evaluation would be a radio programme or any television show which may be evaluated to get a feedback on how well it is received by the target audiance.

Summative Evaluation

Summative evaluation tries to measure end results of a programme in order to decide whether or not it should be continued or discontinued.

These are conducted after completion of programme. It is the systematic use of research techniques to measure outcomes and overall effectiveness of the programme.

Summative evaluation assesses the worth of the final outcome of the programme and examines whether the defined objectives are achieved or not.

This evaluation assesses the questions such as –

- Did the programme achieved their goals?
- What was the intensity of the programme impact?
- What were the unexpected outcomes?
- What aspects of the programme were most or least successful?

An example of summative evaluation would be an increase in fruit production at the end of the programme in five years through national horticulture mission.

12.6.4 According to the stage of the programme- when the evaluation is conducted. It is of two types Cernea and Tepping distinguished between on-going evaluation and ex-post evaluation.

Ongoing or process evaluation: Ongoing or process evaluation means evaluation when the work is in progress, it enables the evaluator and the stakeholders to develop a better understanding of the functioning of the programmes.

Outcome evaluation or ex-post evaluation: Outcome evaluation is done after completion of the work. It enables the participants to assess which of their goals are being achieved and how well this is being done.

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Ex-post evaluation is done to review comprehensively the experience and impact of a project conducted. This serves as a basis for future formulation of the policies and project design.

12.6.5 Degrees of evaluation

According to the nature of evaluation- it is divided into 5 degrees as suggested by Frutchey(1967)

Casual every day evaluations	Self-checking evaluations	Do-it-yourself evaluations	Extension studies	Scientific research
1	2	3	4	5

The first three degrees of evaluation are informal in nature and the next two degrees of evaluation are formal in nature.

1. Causal every-day evaluation: This is the initial part of evaluation we do every day. E.g.- Good dress, best actor, worst speech etc. These simple observations are important but have their own limitations. We must be careful in analyzing what is the truth and what is seen. It is most crude and subjective method of evaluation.

The following are some of the limitations of this type of evaluations:

- Personal ideas used instead of standard measurements.
- Intuition (guess) and personal bias cannot be eliminated
- No systematic plan for arriving at conclusion
- May have only part of the information.

2. Self-checking evaluation: This is the next higher degree of evaluation. It makes conscious attempt to apply principles of evaluation. For example, checking on ordinary observations, talking with others, getting other people's judgments etc.

For instance,if person X comes to an extension worker and says that in balrampur village, farmer Y got 10 tons / acre of yield with Alphanso variety in his mango orchard, Extension worker instead of directly accepting this information, (s)he personally visits the field of the farmer Y and talks to the villagers and self checks whether the information received was correct or not.

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3. Do-it-yourself evaluation: This is still higher degree of evaluation. This involves more careful planning and applies principles of evaluation and are more systematically done. They usually require surveys or score cards.

For example, if A.A.O. gets information that in an X village hail storm has damaged 100% of crops, he will not totally depend on this information alone but he visits the village and with the help of surveys or score cards, he will evaluate by himself the extent of damage to crops.

4. Extension studies: This is the fourth level of evaluation continuum, complicated than the above three methods. Extension personnel use higher tools, techniques, and methods for evaluation purpose. Uses more scientific approach. Eg: theses of M Sc and Ph D in extension studies come under this category

5. Scientific research: last on evaluation continuum and most complex. Experimental studies scientifically carried out to determine cause and affect relationships. The scientific research must be

a. Factual (or Valid): Measure what you think you are measuring

b. Analytical: Analyze the relationships of various factors

c. Reliable: Sample representative of population consistency of results.

d. Objective: Free of bias- others get similar results.

e. Impartial: Approach with a open mind and spirit of enquiry

16.6.6 According to Stages of Evaluation

These four stages are discussed here:

i) Baseline Evaluation

This is the evaluation in the initial planning stage. The data on the indicators are used as benchmark for evaluation. A reliable baseline data on agro-ecological, economical, social, physical and biological parameters are provided for this evaluation.

ii) Mid-term Evaluation

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This evaluation is done in the middle of the watershed program implementation. In this stage of evaluation, initial problems in the planning are overcome and the flow of inputs to the target population is commenced and their response can be observed. The purpose of such mid-term •evaluation is to check on •the effectiveness of each individual activity. This evaluation quantifies the short and mid-term benefits of the project.

iii) Terminal Evaluation

This evaluation is done at the end of the project economic life. It indicates the efficiency of project implementation, accuracy of the project estimates, etc.

iv) Post Terminal Evaluation

This evaluation is carried out after 5 to 15 years of watershed program period. Long-term effects and impacts become visible in this post-terminal evaluation.

12.7 Criteria for Effective Evaluation

For the evaluation to be carried out effectively, the following criteria may be taken into consideration:

1. Objectives defined clearly: For accurate evaluation the objectives need to be clearly defined, which helps in determining, the extent to which the programme is accomplishing its aims. Objectives need to be broken down into more simple, specific and clearly defined ones.

2. Valid instruments of measurement: The devices or instruments which are used for measuring the extent, to which the programme objectives have been achieved, must be authentic and valid. The devices and instruments used must be correct and capable of measuring, what it is to measure.

3. Objectivity: The evaluation conducted must be free from bias, personal prejudice and purely individual judgment. It should also be based on scientific facts and be accurate. For this purpose, external agencies which are not involved in the programme in any way are appointed to evaluate the programme, because of their objectivity.

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4. Reliability: The evaluation method used should be reliable, which means that there needs to be more usage of scientific methods in evaluation. This is important in the context that different experts who are using the same techniques and having equal competence, will reach at the same results.

5. Evidence of Change: The evaluation performed should reveal any change that indicates the accomplishments or non-achievements of the programme. At the end of the programme evaluation should make evident any kind of change that has occurred.

6. Practicability: The evaluation conducted needs to have a practical approach. This criterion refers to the resources available for evaluation and what can be done within the limitation of these resources.

12.8 Steps in extension evaluation process

These criteria represent the ideal with which to compare our practices and procedures or programme planning. Some of the steps needed to evaluate or programming function in view of these criteria include:
i. Identify the evidence needed to form a judgement about each criterion.
ii. Specify the methods that will be used to obtain the evidence, such as personal observation, personal interview or through a systematic survey.
iii. On the basis of the evidence gathered, judge whether or not each criterion is being adequately satisfied in the programme planning activities.

Extension evaluation process

There are several models of evaluation available in the literature. However, a very simplified version of most of these models may be quite workable for evaluating extension programmes since, as Bhatnagar (1987) has pointed out, any extension evaluation process has to be based on certain assumptions.

For example, if some inputs are provided in the form of a programme, specific outputs can be expected and if these outputs happen, then the purpose of the programme can be achieved; if the purpose is achieved, then the development goal is realised.

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This means that evaluation has to be so designed that the quality types and adequacy of the input measures, outputs and their impact in achieving the programme objectives have to be evaluated systematically.

The actual procedure used in evaluating extension programmes may differ depending on the nature, scope and complexity of programmes and resources available for conducting evaluations. Steps involved in an extension programme evaluative process may be as follows:

i) Formulate evaluation objectives: Specific objectives to be achieved through the evaluative process must be clearly and adequately identified and started. All further efforts should be knit around these objectives.

ii) Classify programme objectives:

It is assumed that each extension programme, when formulated and implemented, will have specific well-defined objectives. Since evaluation is basically a process of determining the extent to which various extension teaching activities were organized and managed and the extent to which they contributed to achieving the goals, programme objectives must be clearly understood and if necessary, further broke down into measurable terms. This is a crucial step as all further efforts will be directed towards collecting evidence related to these objectives.

iii) Identify indicators:

To identify indicators or the kind of evidence necessary to evaluate achievement in relation to specified programme objectives, it is necessary that specific beneficiaries of the programme be identified, the kind of behavioural changes expected in them be clearly stated, and the kin of learning experiences expected to be provided to them spelled out, together with the level of management to be achieved for provided those learning experiences are specified. Once this is done, identification of specific indicators to measures the achievements will not be difficult.

iv) Decide the kind of information needed:

Once the indicators for evaluating the management and performance of a programme have been indicated, specific information to be collected may be worked out. Since there is usually more information than an extension worker can collect, he has to be very discriminating about the kind and amount of

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information that should be collected. Timing for collection of information may also need to be specified.

v) Sampling:

The purpose of sampling is to take a relatively small number of units from a population in such a way that the evidence collected from them becomes representative evidence of the entire population. Although there are several sampling methods, perhaps stratified sampling procedures may be most suitable for extension evaluation studies as they allow inclusion of all interested groups and ensure enough heterogeneity in the sample.

vi) Decide the design of evaluation:

An ideal design of evaluation may be an experimental one. This would allow separating the effect of the programme from other factors, by setting control and treatment groups. Several experimental designs, such as one-group pre-test-post-test design, static groups comparison, pre-test, post-test control group design, Solomon four-group design, longitudinal study design, etc. are available in literature and can be used.

However, in actual practice, extension progammes are seldom run in a way that allows an experimental design of evaluation. In Pilot Projects, it might be possible to use an experimental design of evaluation. By and large, a survey method is use. This method can be used for evaluating ongoing progress or as an ex-post facto evaluation of the programme after it has completed its tenure.

vii) Collection and analysis of evaluation evidence:

There are many methods for collecting information for evaluative purposes, such as the mail questionnaire, personal interview, distributed questionnaires, group interviews, case studies, systematic field observations, systematic study of secondary data etc.

Selection of the right kind of data collection method will depend on the objectives of the evaluation, kind of information needed, time and resources available and the type of respondents from whom information is to be collected. However, whatever the method used, a specific questionnaire or interview schedule or data recording sheet must be developed with care.

Once the data is collected, it must be tabulated, summarized and analyzed with

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adequate care. This step should not be rushed. To avoid delay, however, analysis may be done with the help of a computer.

viii) Interpretation and reporting of the results in a proper way:

It is a very crucial as evaluation results can be missed also. Once tentative generalizations are arrived at, it may be appropriate and they are informally discussed among the interpreters as well as with programme planning and implementation officials, so that the results of evaluation are put in a proper perspective.

The evaluation results must clearly state the achievements, failures and future adjustments needed. A written report of the evaluation findings should be prepared and made available to all concerned.

12.8.1 Keys for Evaluation

Six important keys for evaluation are:

1. Statement of Objectives: The objectives of a programme or activity to be evaluated must be clearly defined in terms of "desired behaviour changes" to be observed in the people who are undergoing the process of learning.

2. Source of Evidence: There must be ample proof of the success or failure of each activity of the programme. The programme be examined with the following questions in mind:

- What are educational objectives?
- What subject matter has been taught?
- What teaching methods were used?
- Who could have been influenced to change?
- What kinds of change could we expect?

3. Representative Sample: The persons providing evidence of success must be "representative" of all the population that was involved in the programme.

4. Appropriate Method: The method of obtaining evidence of success must be appropriate to the kind of information being collected.

5. Reliable Questions: Carefully selected language of questions to get reliable and unbiased data.

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6. Plan to use results: It needs to be decided beforehand the real use of evaluation results before actually the evaluation is conducted.

12.9 Problems in Evaluation

Basically, the purpose of evaluation is to judge the effectiveness of a programme, usually in terms of how well it has achieved its objectives. But conducting evaluation is not an easy task. Following problems encountered in evaluation are:

1. Error of observation: Difference is observed in the description of the phenomenon between two evaluators or difference in opinion of the same observer at different occasions.

2. Error of measuring instrument: in data collection

3. Error of measurement: While taking measurements of a sample, errors may occur while measuring.

4. Error of quantification: Chances of error during the process of transfer of data from qualitative to quantitative form.

5. Error due to lack of control: Evaluation deals with human beings and human beings are constantly changing and difficult to control.

6. Error of true responses: Most of the information obtained is based on the expressed opinion of respondents and they may not be giving the correct responses. It is quite difficult to check the truthfulness of the information.

7. Error of operational difficulties: Errors occur if the respondents drop out at the terminal stage or the selected respondents may not be present at the time of researcher's visit.

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Course Name	Fundamentals of Extension Education
Lesson 13	People's Participation: PRA and RRA
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
University Name	Kerala Agricultural University, Thrissur

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13.1 Objectives of the Lesson

- To understand the concepts, principles and levels of people's participation in extension
- To find out the concepts, principles and various tools of RRA
- To explore the concepts, features and principles of PRA
- To identify and understand the selected PRA techniques in people's participation

13.2 Glossary

Participation means that people are involved to achieve the goal of developmental programme

Participatory Rural Appraisal (PRA) is the methodology for interacting with villagers and seeking their participation in putting forward their points of views about problems, analysing them and utilising the information to acquire learning.

Rapid Rural Appraisal (RRA) represents one particular combination of techniques for information collection and approaches to learning about rural conditions which was collected during this period.

Triangulation is the process of cross-checking and progressive approximation of truth

Transect walks are systematic walks with key informants through the area of interest observing, asking, listening, looking and seeking problems and solutions.

Social mapping is mapping tool on the depiction of habitation patterns and the nature of housing and social infrastructure, institutions, organisation etc.

Resource mapping is the diagrammatic representation mainly focuses on the natural resources in the locality and depicts land, hills, rivers, fields, vegetation etc

Ranking method is technique to provides a chance to rural people to express their preferences and reasons for liking certain items

Venn diagram is particularly useful for illustrating the relationships between different groups and institutions within communities,

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13.3 Meaning and typology of People's Participation

13.3.1 Participation and Participatory Extension

The concept of participation is to be taken in terms of verb rather noun. The verb 'participate' has several roots. These are to 'take, grasp and hold'; to 'have a share' to 'make ready' (Shipley 1984 and Barnhart 2001).

Participation refers to: 'coming beyond or before' one may dally' or prepare for other help or harm' to exemplify the sense of 'making ready'. Shipley (1984)

Participation means that people are involved to achieve the goal of developmental programme. i.e from designing to evaluation. It will help to achieve greater equity and efficiency.

13.3.2 Meaning and Definition

It is a multi-directional communication process between and among extension staff and farmers, Involving the sharing, sourcing and development of knowledge and skills, in order to meet farmers needs and to develop innovative capacity among all actors.

The various methods of people participation are Farmer-to-farmer extension, farmer-led extension, farmer-based extension, participatory technology development and dissemination (PTD&D). Cohen and Uphoff (1977)

Participatory Extension includes people involvement in decision making process in implementing programmes and their sharing in the benefits of development programmes and their involvement in the efforts to evaluate such programme.

People's participation can be sought in 4 different ways contract, consultative, collaborative and collegial. Biggs (1989)

It is way to attain general development objectives like efficiency, equity, good governance, capacity building and sustainability. Schneider and Libercier (1995)

13.3.3 Typology of Participation

Participation which means the degree of influence exercised by the people on decision making process in government and administration can assume different

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typology. The major typologies are democratic, social, administrative and community development.

S. N. Mishra mentions two parallel approaches to participation. These are: Political participation and programmatic participation.

D. P. Fauri describes 4 types of participation. These are:

1. Democratic participation
2. Social protest participation
3. Community development participation and
4. Programme participation

1. Democratic participation: Democratic participation may be called political participation. It is the basis of democracy and political modernization or development. According to S. P. Huntington and John M. Nelson, "political participation is the activity by private citizens designed to influence governmental decision making."

2. Social participation: It includes all types of participation. Social participation sometimes takes the form of social protest. The deprived section people have less access to the center of authority to influence the decision making process in government and politics. In this situation social protest can be an effective form of communication between social and political system.

3. Administrative participation: Various scholars called it in different forms as "programme participation" and "community development". It is used synonymously with decision making process. Such as policy planning, programme planning, implementation and evaluation of policies and programmes.

4. Community development participation: Community development is the process by which the people combine their efforts with a view to improving the socio-economic and cultural life of the communities. Community development in South Asian countries primarily mean encouraging rural people to become self reliant making them capable of enlighten their participation in socio-economic

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development and nation building measures through mobilization and utilization of resources.

Three different participation processes can be identified though they do not necessarily exclude one another: non participation, controlled participation, and power participation.

The first type non participation is also a form of participation even though in this type one participates passively. In non participation process one gives ones power to certain another person. The example of this kind of participation can be voting.

The second type of participation is controlled participation. This type partaking is limited as well as can be somehow manipulated and controlled. Limited participation means that participation is limited for example with budgets, higher education.etc.

The power participation is strongest form of participation, which is based on the ways that promote democratic, authenticate and autonomous participation. Power participation is neither passive nor manipulated. This type of management can be divided to co management and self management.

Co-management means active participation in decision making. The participation may be limited and not all decision making shared in co-management

Self management on the contrary is the most advanced form of power participation. In the strictest sense this refers to people's direct participation in decision making.

13.4 Levels and principles of People's Participation

13.4.1 Level of People's Participation in Programme Planning

People's participation is of crucial importance for the success of an extension programme. The various levels and degree of people participation in the extension programme planning process.

Nothing can be imposed on the people, rather voluntary participation of the people has to be encouraged and obtained. Participation in planning and

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implementation of programmes is important, because this process helps people to learn to change their behaviour for their own development.

1. Passive Participation

People participate by being told what is going to happen or has already happened. It is a unilateral announcement by an administration or project management without listening to people's responses. The information being shared belongs only to external professionals.

2. Participation by consultation

People participate by being consulted and external agents listen to their views. These external agents define both problems and solutions and may modify these in the light of people's responses. Such a consultative process does not concede any share in decision making and professional are under no obligation to accept people's views.

3. Interactive Participation

People participate in joint analysis, which leads to action plans and the formation of new local institutions or strengthening of existing ones. It tends to involve interdisciplinary methodologies that seek multiple perspectives and make use of systemic and structural learning processes.

4. Participation in information giving

People participate by answering questions posed by extractive researches using questionnaire surveys or similar approaches. People do not have the opportunity to influence proceedings as the findings of the researches are neither shared nor checked for accuracy. For instance, President of SHG to providing necessary information to the members

5. Participation for material incentive

People participate by providing some on-farm facilities like land, labour, irrigation etc. in lieu of certain external inputs like seeds, fertilizer, pesticides and even cash incentives etc. The people may not prolong the activities when the incentives end.

6. Functional participation

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If the above mentioned arrangement is for conducting on-farm demonstrations, on farm trial there is more of functional involvement and more of sharing knowledge by the people of external agency. People may also participate by forming groups to meet predetermined objectives related to a project.

7. Self-Mobilization

People participate by taking initiative independent of external institution to change systems. They develop contact with external institutions for resources and technical advice they need, but retain control over their resources are used. Such self-initiated mobilization and collection 'action may or may not challenge existing inequitable distribution of wealth & power for example, 3- tier Panchayati Raj system in India.

13.4.2 Principles of Participation

1. Inclusion

2. Equal Partnership

3. Transparency

4. Sharing Power

5. Sharing Responsibility

6. Empowerment

7. Co operation

1. Inclusion of all people or representatives of all groups who will be affected by the results of a decision or a process. For example, inclusion of all types of people involve in a development project.

2. Equal partnership means recognizing that every person skill, ability and initiative and has equal rights to participate in the process regardless of their status.

3. Transparency principle indicates all participants must help to create a climate conducive to open communication and building dialogue.

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4. Sharing power refers authority and power must be balanced evenly between all stakeholders to avoid the domination of one party.

5. Sharing responsibility principles conveys similarly, all stakeholders have equal responsibility for decision that is made and each should have clear responsibilities within each process.

6. Empowerment is the participation with special skills should be encouraged to take responsibility for tasks within their speciality, but should also encourage others to also be involved to promote mutual learning and empowerment.

7. Cooperation is very important in every people participation process where sharing everybody's strength reduces everybody's weaknesses. The community is responsible for implementing the program activities as specified by the government; community members attend project planning, implementation and review meetings and also actively involved in decision about how to implement a particular project and provide some of the necessary supports and inputs.

13.5 Method of People's Participation: concept of RRA and PRA

There are various methods of participatory extension like RRA, PRA, PLA, PAR etc. There are also others participatory extension approaches such as Farmer-to-farmer extension, farmer-led extension, farmer-based extension, participatory technology development and dissemination. We are going to discuss the two methods viz; RRA and PRA in details.

There are three terms, which we should be acquainted with: (i) RRA – RRA originally stood for Rapid Rural Appraisal, but its approach and methods are also used in urban and other contexts; (ii) PRA – PRA originally stood for Participatory Rural Appraisal, but its applications are in many contexts besides rural and good practice is far more than just appraisal; and (iii) PLA – PLA stands for Participatory Learning and Action. As a term, it is often used interchangeably with PRA.

RRA is about finding out. It is data collecting, with the analysis done mainly by experts. There are some methods, which are typically RRA methods like observation, semi-structured interviews, transects, etc., whereas participatory mapping, diagramming, using the ground in various ways, making comparisons

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etc., often in small groups are typically PRA/PLA methods. However, the methods can be used in all the three with certain precautions

Participatory Learning and Action (PLA) is an umbrella term for a wide range of similar approaches and methodologies, including Participatory Rural Appraisal (PRA), Rapid Rural Appraisal (RRA), Participatory Learning Methods (PALM), Participatory Action Research (PAR), Farming Systems Research (FSR), and many others.

The common theme to all these approaches is the full participation of people in the processes of learning about their needs and opportunities, and in the action required to address them.

13.5.1 Meaning and concepts of RRA

Concept of RRA

During the 1970s and early 1980s, efforts were being carried out in numerous parts of the world, with the encouragement of a variety of organisations, to create such a methodology to overcome the draw backs of non-participatory extension. Rapid Rural Appraisal (RRA) represents one particular combination of techniques for information collection and approaches to learning about rural conditions which was collected during this period.

It needs to be emphasised that, at least initially, what came to be called RRA was a collection of techniques, most of which were already being used by development workers and NGOs in many parts of the world. The development of RRA consisted in putting these techniques together into a more systematic framework which was then tested, added to and refined in order to make it usable and accessible to a wider range of operators.

Rapid Rural Appraisal (RRA) emerged in the late 1970s in response to some of the problems with large-scale, structured questionnaire surveys. It provided an alternative technique for outsiders often scientists carrying out research into agriculture and to quickly learn from local people about their realities and challenges.

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RRA practitioners worked in multi-disciplinary teams and pioneered the use a suite of visual methods and semi-structured interviews to learn from respondents. While it was largely about data collection, usually analysed by outsiders, RRA contained the seeds from which other PMs grew in the 1980s. Reflections on RRA led to the development of Participatory Rural Appraisal (PRA), which focused more strongly on facilitation, empowerment, behaviour change, local knowledge and sustainable action.

RRA is more commonly described as a systematic but semi-structured activity out in the field by a multidisciplinary team and is designed to obtain new information and to formulate new hypotheses about rural life. A central characteristic of RRA is that its research teams are multidisciplinary.

13.5.2 Features of RRA:

RRA essentially consists of the following:

- an activity carried out by a group of people from different professional fields or disciplines which usually aims to learn about a particular topic, area, situation, group of people or whatever else is of concern to those organising the RRA
- it usually involves collecting information by talking directly to people "on the ground"
- it uses a set of guidelines on how to approach the collection of information, learning from that information and the involvement of local people in its interpretation and presentation
- it uses a set of tools - these consist of exercises and techniques for collecting information, means of organising that information so that it is easily understood by a wide range of people, techniques for stimulating interaction with community members and methods for quickly analysing and reporting findings and suggesting appropriate action.
- Chambers (1992) has suggested 'R' of RRA stands better for relaxed (and not for rapid) allowing plenty of time

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13.5.3 Meaning and concepts of PRA

Robert Chambers describes the orientation of RRA as a "fairly-quick and-fairly-clean" appraisal and he propounded more participatory, empowered method PRA. Participatory Rural Appraisal (PRA) is most widely used participatory methods used in agriculture and rural development as data collection techniques.

Participatory Rural Appraisal is a family of approaches and methods to enable local people to share, enhance, and analyse their knowledge of life and conditions, to plan, and to act. (Robert Chambers, 1992)

These are rapid rural appraisal (RRA) and participatory rural appraisal (PRA). These techniques have enabled local people to express, share, emphasize and examine their knowledge. RRA had been in practice till late 1970s and 1980s. Some limitations and flaws have been observed in participation of village community in RRA. This is due to some outsiders who used to enter the village area to obtain data from the village people and thus they finally become the central executing members.

In the late 1980s, PRA technique was evolved. In PRA, investigators or members are all villagers. They control the whole project. They are learners, catalysts and facilitators.

PRA is the methodology for interacting with villagers and seeking their participation in putting forward their points of views about problems, analysing them and utilising the information to acquire learning.

It is a methodology for action research and utilizes a range of techniques. it involves local people and outsiders from different sectors and disciplines, outsiders a facilitates local people in analyzing information, practicing critical self-awareness, taking responsibility and sharing their knowledge of life and conditions to plan and to act.

13.5.4 Difference between RRA and PRA

Criteria	RRA	PRA
Major development	Late 1970s, 1980s	Late 1980s, 1990s
Major innovators in	Universities	NGOs

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Main users	Aid agencies, universities	NGOs, government field organizations
Key resource earlier overlooked	Local people's knowledge	Local people's capabilities
Main innovation	Methods	Behaviour
Outsider's mode	Eliciting	Facilitating
Objectives	Data collection	Empowerment
Main actors	Outsiders	Local people
Longer-term outcomes	Plans, projects, publications	Sustainable local action and institutions

13.6 Principles of RRA

13.6.1The fundamental principles of RRA

The fundamental principles of RRA must be adhered to despite a variety of approaches have been used by different researchers. These principles are triangulation, optimal ignorance, appropriate imprecision, rapid and progressive learning, learning from, and along with, rural people.

1. Triangulation relates to the use of more than one, often three, sources of information for validation. In order to obtain information, there is no way that can be termed the "best." Therefore, in order to improve accuracy of information, triangulation becomes an important element of RRA.

2. Optimal ignorance means knowing the difference between what is worth knowing and what is not, enabling the collection of information that is required for the research projects. This avoids collection of too much irrelevant data.

3. Appropriate imprecision. In conventional surveys, many of the data collected have a degree of precision that is really unnecessary. It is often more useful to obtain causes of problems, trends and directions of change, rather than accurate information on the absolute numbers affected by the problem.

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4. Rapid and progressive learning can occur because of the exploratory and iterative nature of RRA. Many new issues are raised along with better insights into the problems. However, it is these new issues and insights that lead to an understanding of the real problems and their solutions.

5. Learning from, and along with, rural people. Local perceptions and comprehension of situations and problems are essential to learn and understand, since the intention is to plan programmes that are viable and acceptable to the local inhabitants.

The knowledge base of local inhabitants must be tapped in order to avoid misconceptions about the lives and constraints of this population. Also, by involving the local community in both defining community needs and identifying possible solutions, the people develop a "sense of ownership" of the activity. This reduces the possibility of failure.

13.7 Techniques of RRA

RRA has tended to stress the use of secondary sources, observation and verbal interaction. Semi-structured interviewing and focus groups have been stressed.

The techniques of RRA include:

- interview and question design techniques for individual, household and key informant interviews
- methods of cross-checking information from different sources
- sampling techniques that can be adapted to a particular objective
- methods of obtaining quantitative data in a short time frame
- group interview techniques, including focus-group interviewing
- methods of direct observation at site level, and
- use of secondary data sources.

13.7.1 Some selected tools of RRA

There is no standard set of techniques that can be used in all circumstances, and a deliberate selection of a combination of tools should be used. Nonetheless, data must be collected from secondary as well as primary sources.

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13.7.2 Secondary data collection

Collection of information from secondary sources is vital prior to the initiation of actual field work. Various secondary sources should be tapped, depending upon the objectives of the particular research. Secondary sources include:

• Review papers on the issue for the particular region under study.

• Published government data/statistics

• Discussions with selected experts from various disciplines.

• Informal discussions with selected key-informants, which may constitute village leaders, members of local voluntary agencies or organizations, local health personnel, school teachers, etc.

• Maps and aerial photographs can also be used to mark the region for study and assess the topographic and other characteristics of the area selected.

• A knowledge of existing programmes for community development, both regional and national.

13.7.3 Primary data collection

Semi-structured interviews: in this method, the interview schedules are developed in a semi structured manner. The interviewee is allowed to put forward his/her views on a particular issue and the role of the interviewer is to listen and maintain focus and direction to prevent the conversation from going off on a tangent. The most crucial part of such an interview is to develop a rapport with the community, and this is most often established by listening to the people talk about their problems rather than suggesting solutions.

Group discussions: Group discussions have a special advantage over personal interviews in that a larger body of information can be collected, covering larger groups of people, in a short time. Group discussions are also useful to cross check information. Also, certain information that may be sensitive is more easily obtained in larger gatherings where the source cannot be pin-pointed to one individual alone. Such information often relates to misuse of funds and resources or to maltreatment or violence directed against certain groups of people.

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However, selections of the group should be done carefully and it must be homogeneous in nature.

Focus group discussions: Focus group discussions are techniques in which specific related group like mango cultivator's group, vegetable marketing group etc. are discussed in details. Focus group discussion is particularly useful to elicit information regarding disease pest infestation, homogenous problems faced by the members and their control. Group and focus group discussions have an advantage of the self-correcting mechanism within the group, Participants for focus group discussions may be selected at random, following brief interviews.

Direct observations: Direct observations of all major activities may not be possible with RRA. However, taking the time to just walk around in the community, observing activities and asking questions at opportune moments, may yield important information. The best way to study the socio-cultural patterns, customs and local behaviour of the community is by simply being there. Direct observations are valuable for checking differences between knowledge and actual practice. Direct observation of the farmers about their daily work activities is effective tool to get the in depth knowledge regarding their socio-economic situations, agro-ecosystem etc.

Key informants: Key informants can be a major source of information. People from the community who, because of official position or informal leadership have access to information about the community rather than individual problems are good resources. Key informants can be government officials, local health service personnel, traditional healers, community leaders (elected or self-appointed), local shop owners and members of nongovernmental organizations.

Village or community profile: Simply being around in the community and observing facilitates information gathering. In the initial days, when efforts are being made to develop a rapport with the people and to make your own presence less conspicuous, it is useful to map the village. All that would be required for this is a notebook, pen/pencil and observational skills. The socio-economic condition, resources available in the villages' etc information on all these aspects can be

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gleaned over a period of time through mere observation. It is a handy tool, once completed, and gives a total view of the area under study at a glance.

13.8 Scope and application of PRA

13.8.1 Scope of PRA

1. It takes into account the people's indigenous knowledge

2. It is learning through participation about livelihood system and interaction of various facts.

3. It helps in joint evaluation of problems and opportunities.

4. The PRA is concerned with collecting information through participation.

5. It helps farmers to communicate their perception in their own language and mode of communication. Thus the of use symbols, maps and drawings is made not in standard forms of art but in a manner villager can understand and do naturally.

6. It requires living and looking at life from close quarters, using methods that enables participation and learning. It lays emphasis on listening to peoples experiences, history, culture, priorities and performance.

7. It encourages multidisciplinary investigation using multiple methods for cross checking to allow different perspectives.

8. Attitude of listening, learning and respect for rural people is essential for conducting PRA to enable mutual learning and understanding.

13.8.2 Objectives of PRA

The PRA has multiple uses in various sectors with varieties of application. PRA is used

- To ascertain needs
- To determine priorities for development activities
- Within the scope of feasibility studies
- During programme execution
- During monitoring and evaluation of projects for specified studies
- To focus on formal surveys and identify conflicting group interests

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13.8.3 Areas of application

- Natural resource management
- Agriculture/farming systems
- Poverty alleviation/women in development programme
- Adult education
- Health and nutrition
- Water and sanitation
- Preliminary and primary education
- Village and district level planning
- Institutional and policy analysis
- Gender and socioeconomic analysis

13.9 Source and principles of PRA

13.9.1 Sources of PRA

The approaches and methods described as PRA and evolving so fast that the to propose one secure and final definition would be unhelpful. As PRA further evolves, there will be changes in what it can usefully mean. It has been called an approach and method for learning about rural life and conditions from, with and by rural people the prepositions have sometimes been reversed in order to ready by with and from PRA is though more than just learning.

It extends into analysis planning and action. PRA as a term is also used to describe a variety of approaches to cover these a recent description is that PRA is a family of approaches and methods to enable rural people to share, enhance and analyse their knowledge of life and conditions to plan and to act.

Five streams which stands out of as sources and parallel to PRA are in alphabetical order

1. Active participatory research

2. Agro-ecosystem analysis

3. Applied anthropology

4. Field research on farming system

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5. Rapid rural appraisal

Active participatory research

It is nothing but the family of approaches and methods which use dialogue and participatory research to enhance the people's awareness and confidence and to manpower their action. Activist participatory research in this sense owes much to the work and inspiration of Paulo Freire Key commonly shared ideas and an imperative that stands out are

1. A poor people are act creative and capable and can and should do much of their own investigation, analysis and planning.

2. Outsiders have a role as convenors, catalysts and facilitators and

3. The weak should be empowered.

Agro-ecosystem analysis

Agro-ecosystem analysis was so powerful and practical that it quickly overlapped with and contributed much to PRA. In some cases, either or both labels could be used to describe what was done. Some of the major contributions of agro-ecosystems analysis to current PRA and have been

1. Transects

2. Informal mapping

3. Diagramming and

4. Innovation

PRA represents an extension and application of social anthropological insights, approaches and methods, cross –fertilised with others. Some of the many insights and contributions coming from and shared with social anthropology have been;

1. The idea of field learning as flexible art rather than rigid science.

2. The value of field residence, unhurried participant observation and conservations.

3. The importance of attitudes, behaviour and support.

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4. The emic-etic distinction and

5. The validity of indigenous technical knowledge.

13.9.2 Basic Principles and Fundamentals of PRA

Basic Principles

PRA is a reversal of learning. It is an informal way of learning from the local, physical, technical, social and psychological knowledge of the people. PRA is a way to understand and analyze the peoples' living conditions, to share the outcomes and to plan for their activities.

PRA is conducted to establish rapport with the people. It also aims to identify and define their problems for prioritization in the village itself. PRA is the technique of immediate analysis and survey of village resources, based on principle of listening and progressive learning. Thus, the main principle is to gather information about the villagers, their willingness to participate and resources of the area through patient listening and interaction.

Fundamentals of Participatory Rural Appraisal

1. A reversal of learning: To learn from rural people directly on the site and face to face gaining from local, physical, technical and social knowledge.

2. Flexible and use of local resources: Learning rapidly and progressively with conscious exploration. Flexible use of method, opportunism, improvisation and easy to adapt in the learning process through PRA.

3. **Offsetting biases:** PRA method mainly based on the overall equity participation of the villagers by being relaxed and not rushing. Listening not lecturing is key communication skill. Probing instead of passing on to the next topic being unimposing instead of important and seeking out the poorer men and women and learning their concerns and priorities.

4. **Optimising tradeoffs**: Relating the cost of learning to the useful truth of information, with tradeoffs between quantity, relevance, accuracy and timeliness. This includes the principles of optimal ignorance knowing what is not worth knowing and of appropriate impression not measuring more than needed. As

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keyness is reputed to have said it is better to be approximately right than the precisely wrong.

5. Sharing: It is the sharing of information, ideas, knowledge and experience between facilitators (i.e., policy makers) and villagers (i.e., stake-holder population).

6. Villagers as Performers: The facilitators should initiate a process so that villagers can work as performers, taking up the task of facilitating investigation, analysis, presentation and learning.

7. Self-Critical Awareness: Facilitators examine critically and continuously their own behavior.

8. Personal Responsibility: Personal responsibility should be taken up by the facilitators for what is done rather than relying on the authority or authorities for the rigid set of rules.

9. Maximizing Diversity: By ensuring maximum diversity, the information is enriched. It is essential to notice and investigate the differences, contradictions and anomalies. The objective should be to seek variability rather than objectives.

10. Triangulation: It is the process of cross-checking and progressive approximation of truth. Here, investigators assess from findings from different methods, places, times and disciplines.

13.9.3 Assumptions and Basics of Participatory Rural Appraisal

PRA is based on the following assumptions.

- It is assumed that it is quite possible and desirable to involve local community in the development projects of the watershed.
- It is also assumed that active participation of the local people can be increased with time in the ongoing works.
- It is assumed that learning from the local people is possible.
- It is assumed that informal approaches and discussions with local people are more effective as the projects progress.

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- In the execution of the project, multidisciplinary teams are more effective in completing the works in time smoothly.
- The issues that may be involved in the developmental works should be investigated from different perspectives with the help of different approaches.
- The circumstances and systems can be explored instead of adhering to statistical findings.

The PRA need to include the following basic approaches:

- Due respect for behaviour, attitudes, aptitude and knowledge of the village people should be given.
- Facilitators should have full confidence on the ability of the community to do things.
- There exists a lot of scope for learning from the community.
- Facilitation to the community should be recommended to encourage them to do all the investigations, planning and analysis.
- The community should be empowered to own the outcome as an incentive.
- Information and field experience are to be collected and shared by both the facilitators and the community.

Thus, in the basic approaches of PRA, more emphasis is given to the establishment of a cordial relationship between the community and the facilitators. It is also attempted to let the community feel more empowered during the whole process. Local people should be involved as active agents.

13.10 Techniques of PRA

PRA uses various tools and techniques which can be broadly categories in to following category viz; mapping related, ranking related, relationship oriented, time related and diagram methods.

13.10.1 Mapping

Participatory mapping is one of the most versatile and powerful tools in generating pictures on any aspect of the physical reality. The technique is pictorial or symbolic representation of information. It is a visual representation of what the community perceives as their community space.

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This involves construction of maps on the sand, ground or on paper using locally available materials such as sticks, stones, flowers, grass and others. Also it is used for providing distribution information for instance, population distribution, demographic data, infrastructure, natural resources etc.

These maps cannot be compared with the geographical maps, exactly reduced representations of geophysical structures. Different types of maps used are social maps and resource maps. The social and resource mapping combined called as socio-resource mapping or village mapping

13.10.1.1 Social mapping: Social mapping is perhaps the most popular method in PRA. For many, in fact, it is synonymous with PRA itself. The focus here is on the depiction of habitation patterns and the nature of housing and social infrastructure: roads, drainage systems, schools, drinking water facilities, etc.

Social map is different from other regular maps in significant ways. For one, it is made by local people and not by experts. For another, it is not drawn to scale. It depicts what the local people believe to be relevant and important for them.

Thus it reflects their perceptions of the social dimensions with their reality with the high degree of authenticity. In spite of there being many overlaps, a social map is different from a resource map. The latter depicts the natural resources – land, water sources, flora and fauna, etc. In certain cases, though, a map could be a rich combination of the two. This is a quite often so in the case of areas having a dispersed settlement pattern.

The chief feature of a social map is that it is a big help in developing a broad understanding for the various facets of social reality, viz., social stratification, demographics, settlements patterns, social infrastructure, etc.

13.10.1.2 Resource Map: Resource map is one of the most commonly used PRA methods next to social map. While the social map focuses on habitation, community facilities, roads, temples, etc., the resource map focuses on the natural resources in the locality and depicts land, hills, rivers, fields, vegetation etc.

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A resource map may cover habitation as well. At times, the distinction between the resource and social map may get blurred. A resource map in PRA is not drawn to scale. It is done not by experts, but by the local people.

The local people are considered to have an in-depth knowledge for the surroundings where they have survived for a long time. Hence the resource map drawn by the local people is considered to be accurate and detained.

It is important to keep in mind, however, that it reflects the people's perception rather than precise measurements to scale. Thus, a resource map reflects how people view their own locality in terms of natural resources.

Resource maps have been used for depicting of various aspects related to the natural resource management of a locality Resource maps have been found especially useful because they provide a focussed spatial structure for discussion and analysis.

Fig13.1 socio-resource map of singhjharan village.odisha

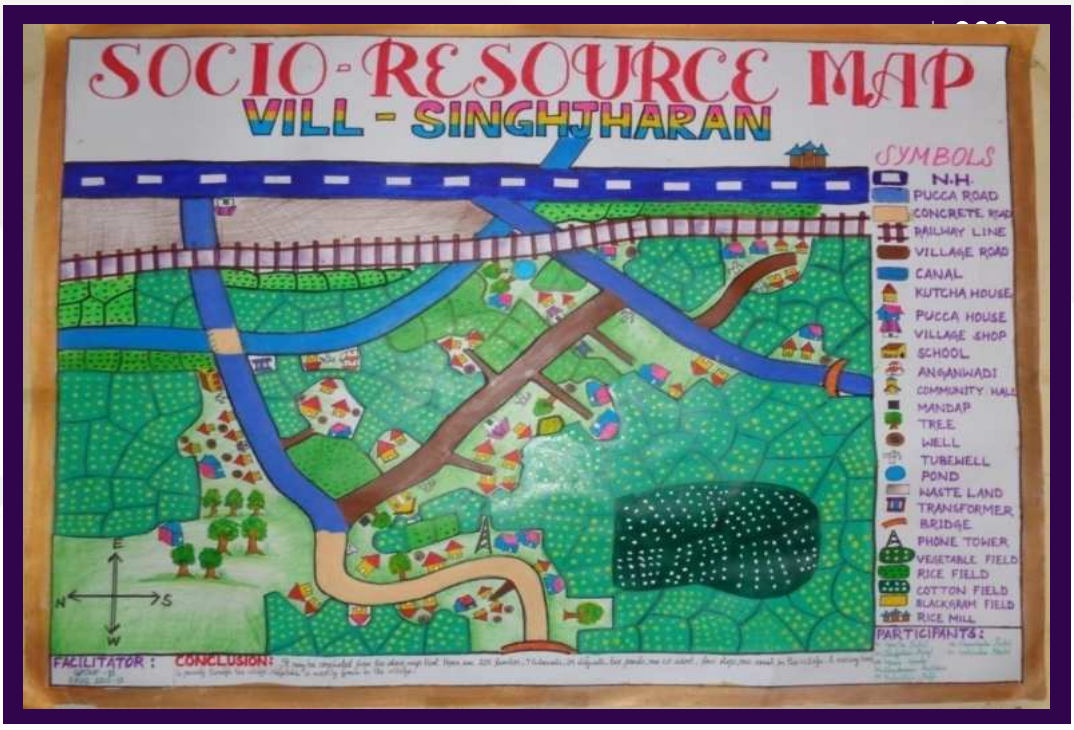

Fig13.2 drawing of socio-resource map balarampur village, Odisha

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Source: RAWE Report 2014, C. A. Bhawanipatna, OUAT.

13.10.2 Transect walk:

Transect is another PRA method used to explore the spatial dimensions of people's realities. It has been popularly used for natural resource management. It provides a cross sectional representation of the different agro- ecological zones and their comparison against certain parameters including topography, land type, land usage, ownership, access, soil type, soil fertility, vegetation, crops, problems, opportunities and solutions.

Though natural resources remain the focus of any transect, this does not mean that there is no place for the depiction of social aspects. Various social aspects for e.g., the caste and ethnic determinants of a settlement access and control and gender-related dimensions are captured in detail, depending upon the objectives of the exercise.

A transect is different from resource map despite areas of overlap. The resource map provides a bird's eye view of the locality with a focus of natural resources. A transect, however depicts a cross sectional view of the different agro- ecological zones and provides a comparative assessment of the zones of different parameters.

It is generally done after a resource map and, therefore, helps in triangulation. It also helps in taking forward the process of problem identification and planning for the development of the natural resources in the area.

Fig 13.3 Trasect map of singhjharan village, Odisha

Source: RAWE Report 2014, C. A. Bhawanipatna, OUAT.

13.10.3 Mobility map:

Mobility map is a PRA tool which is used to explore the movement pattern of farmers for in search of resources, services, and other purposes. It tries to answer questions which are based on their movement like where people go and for what reason? How frequent are the visits, what is the distance, and what is important about the place visited?

This information gives us a snapshot of resources which are lacking in the village and which are surplus. For all other purposes where villagers go or from where they avail like marketing of agricultural produce, procurement of seeds and planting materials, purchase of fertilizers, pesticides, agricultural tools and implements, etc. By knowing this scientist, researchers, policy makers can suggest possible interventions for arranging such services or materials either within the village or at a nearby place.

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Mobility map is a PRA method used to explore the movement pattern of an individual, a group, or the community. The focus is on where people go and for what. The main objective is to understand the mobility pattern of local people where they go and for what purpose

Other aspects, like the frequency of visits, distance, and the importance of the place visited, may also be studied and depicted. It reflects the people's perception of movement patterns and the reasons there of.

Fig 13.4 mobility map of singhjharan village, Odisha

Source: RAWE Report 2014, C. A. Bhawanipatna, OUAT.

13.10.4 Venn diagram

Venn diagram or chapati diagram is another PRA tool use to know about the institutions, organizations, groups etc. working with or for the particular village. In venn diagram, village and organisations are drawn in the form of circle, village circle is present at the centre while institute circles are present either within village circle or in its periphery depending upon their locations with respect to the village.

Sizes of the institute circles are directly proportional to their importance with respect to the villagers and connection among them indicates their interaction

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with each other. Here main focus is to identify external and internal organizations/groups/important persons active in the community

It is a PRA method that shows the institutions, organisations or groups as well as influential individuals in a village and their inter relationship and their importance in decision making.

In the Chapati diagram as the method uses circles of various sizes to represent institutions or individuals. Discuss for each organisation how important they are for the villagers. The most important one are then drawn as a big circle and the less important ones as smaller circles. Discuss in which way the villagers benefit from the different organisations.

Show the degree of contact/co-operation between the community and those institutions by distance between the circles as follows:

- Largely distanced circles: no or little contact or co-operation
- Circles close to each other: only loose contacts exist
- Touching circles: some co-operation
- Overlapping circles: close co-operation

Fig 13.5 Venn diagram of Karlaguda village,odisha

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Source: RAWE Report 2015, C. A. Bhawanipatna, OUAT.

13.10.5 Time line

Time line is an important PRA method quite commonly used to explore the temporal dimensions from historical perspective. Time line captures the chronology of events as recalled by local people. It is drawn as a sequential aggregate of past events.

It thus provides the historical landmarks of a community individual or institutions. The important point to note here is that it is not history as such but events of the past as perceived and recalled by the people themselves.

It is another PRA tool which quite commonly used to explore the temporal aspects of a village. Timeline captures the chronology of events as recalled by local people; especially here old age peoples are preferred mostly for information. It is a historical transect of the village which is used for linking past and present conditions of the village.

The purpose of this tool is to obtain historical account of changes in demography, socio-economic conditions, communication, social relationships and interaction, technology diffusion and adoption etc.

It helps outsiders to learn from the community what villagers consider the important past events happens in the village. Timeline as a PRA tool also generate information on changes of different issues of a community/ village.

Fig 13.6 Timeline of Pradhaniguda village.odisha

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TIMELINE OF PRADHANIGUDA

YEAR	KEY EVENTS	SIGN.
1806	ESTABLISHMENT OF THE VILLAGE.	
1810	ESTABLISHMENT OF LORD SHIVA TEMPLE.	
1901	PRIMARY SCHOOL ESTABLISHED.	
1960	FIRST BI-CYCLE PURCHASED.	
1965	FIRST RADIO PURCHASED.	
1975	FIRST ELECTRICITY SUPPLIED.	
1980	FIRST BIKE PURCHASED.	
	FIRST TUBEWELL DUG.	
1989	FIRST TELEVISION PURCHASED.	
1990	COTTON CULTIVATION STARTED.	
1994	FERTILISER APPLICATION STARTED.	
1995	FIRST TELEPHONE PURCHASED.	
	INDIRA AWAS YOJANA STARTED.	
1996	FIRST PUCCA HOUSE BUILT.	
2006	CONCRETE ROAD CONSTRUCTED.	
2013	SRI CULTIVATION STARTED, ADOPTED BY KVK.	
2015	FOUNDATION OF MEGA IRRIGATION PROJECT.	
	FIRST USE OF HARVESTER.	
2017	FARMERS' CLUB STARTED IN THE VILLAGE.	

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CONCLUSION

From above data, we concluded that Pradhaniguda is developing rapidly in last two decades through adoption of modern technologies.

FACILITATORS:-
ADPS NO.

Source: RAWE Report 2017, C. A. Bhawanipatna, OUAT.

13.10.6 Seasonal analysis

Seasonal diagram is also called seasonal calendar, seasonal activity profile and seasonal analysis. Seasonal diagram is one of the popular PRA methods that has been used for temporal analysis across annual cycles, with months or seasons as the basic unit of analysis. It reflects the perceptions of the local people regarding seasonal variations on a wide range of items.

Seasonal diagrams, however, are not based on statistics, though they may be triangulated against secondary or primary data in order to verify the information generated. Seasons are an integral part of people's lives and exert an important impact upon the livelihood of the local people, particularly in rural areas. Seasonal diagrams have been used to explore what happens during the year and when. Quantification and depiction of the magnitude of the various activities adds to their utility and richness.

Seasonal diagram helps to identify heavy workload periods, periods of relative ease, credit crunch, diseases, food security, wage availability etc. It has proved to be useful in project planning, i.e., when to implement various activities. It has been

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used to identify periods of stress and to plan for when intervention is most required.

With a seasonal diagram it is possible to identify and analyse the livelihood pattern across the year. The major strength of seasonal analysis is that it depicts a range of items and their magnitudes, which helps in understanding how these items are related to and influence one another. These relationships can be quite revealing

Fig 13.7 seasonal analysis map of Pradhaniguda village, Odisha

(Seasonality Diagram of VillagePradhaniguda)

Source: RAWE Report 2017, C. A. Bhawanipatna, OUAT.

13.10.7 Trend analysis

Trend line or time trend is a time related or temporal method which is used to depict changes directly or indirectly related to agriculture and allied takes place over time. This is also useful to represent the data quantitatively. This use mainly to grasp the changes in many variable like area under cultivation, production over time, human population, food production in village, imported food from outside of the village, livestock population, rainfall pattern, temperature, mechanization in village (number of tractors, number of power tiller etc.) ,

Fig 13.8 Trend analysis of cotton karlaguda village.odisha

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Source : RAWE Report 2015, C.A.Bhawanipatna

13.10.8 Daily activity profile:

Daily activity profile of both the male and female farmers of any village depicts their economical and uneconomical daily activities since morning to night. Every farmer has different daily routine based on their type of farming and other activities.

In order to plan any extension intervention, information about the daily routine of the farmers is a prerequisite. Here main focus is to find out their free time which they may spare on any planned intervention. It helps us to plan some suitable intervention based on their free time available.

13.10.9 Matrix ranking:

Matrix ranking is a tool used for systematic comparison of related technologies viz., cultivars or varieties of a crop adopted in a village. Three key informants who have enough practical knowledge about the adopted cultivars / varieties in respective crops need to be referred for information.

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Key informants or selected farmers will be asked to rank the cultivars / varieties on the basis of different criteria selected. Later, ranks given by participants need to convert to scores. All the scores with respect to different criteria were summed (for one particular criteria, total numbers of scores assigned are equal to the number of key informants enquired) to get grand total.

The cultivar / variety which receive the highest score will be ranked first while others receive subsequent rank as per the score received. This tool will help to know which cultivar lacking which quality and how to overcome that.

Fig 13.9 Matrix ranking map of Rica and cotton singhjharan village,Odisha

Source: RAWE Report 2014-15, C. A. Bhawanipatna, OUAT.

13.11 Advantages and disadvantages of PRA

13.11.1 Advantages of PRA

Identification of genuine priorities for target group: PRA allows local people to present their own priorities for development and get them incorporated into development plans.

Devolution of management responsibilities: An important goal of PRA is to encourage self-reliant development with as much of the responsibility for the

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management and implementation of development activities devolved to local people themselves. This can greatly improve the efficiency of development work and eliminate many of the problems regarding proprietorship of development activities at the community level.

Motivation and mobilisation of local development workers: Participation in PRA by local development workers, whether from NGOs, government or other agencies can greatly increase the motivation and level of mobilisation in support of the project or programme of which it is part. Involvement in a PRA can help them understand the priorities of workers from other disciplines as well as those of members of the community.

Forming better linkages between communities and development institutions: PRA can assist in forming better links between communities and the agencies and institutions concerned with rural development. PRAs involve intensive interaction between communities and outsiders which can have lasting effects in breaking down the barriers of reticence and suspicion which often characterise these relationships.

Use of local resources: Where local people have had more say in the design of projects they are also more likely to design activities which make full use of existing resources.

Mobilisation of community resources: Greater commitment from the community can also mean greater mobilisation of community resources for development and less reliance on outside inputs. This can take the form of labour inputs, savings or time devoted to management functions.

More sustainable development activities: This combination of effects will generally lead to more sustainable development activities which are less reliant on support from outside agencies and is technically, environmentally and socially appropriate to local conditions.

13.11.2 Disadvantages of PRA

Raising expectations which cannot be realised: One of the most immediate and frequently encountered risks in PRA is that it raises a complex set of expectations

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in communities which frequently cannot be realised given the institutional or political context of the area. This can be due to the political situation, the local power and social structure or simply to bureaucratic inertia in institutions which are supposed to be supporting development.

Proposal of development plans which participating agencies cannot respond to: Linked to this first point is the risk that the development priorities which communities identify during the course of a PRA may be ones which participating agencies simply cannot respond to adequately in the technical sense, thus again raising expectations only to disappoint them.

Risk of "capture" of activities by local interests: Poor people in the community might support "community" decisions which will not benefit them at all because they are supported by their wealthier and more influential patrons. Fruit orchards can be particularly prone to this as it is often proposed as a means of making better use of "common" land. The act of "developing" those areas may bring them into the sphere of influence of local authorities and deprive poorer people of access.

Failure to take account of stratification in communities: In PRA, decisions about how to accommodate the conflicting interests of different groups have to be left up to the community itself and, while one of the roles of outsiders involved in PRA is to encourage negotiation and arbitration between different interest groups, if the "community" decides that they want to resolve problems by ignoring the interests of the poor and weak, it may be difficult for "outsiders" to do much about it, especially if they are committed to devolving responsibility to the community

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Course Name	Fundamentals of Extension Education
Lesson 14	Motivation of Farmers: Concept and Techniques
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
University Name	Kerala Agricultural University, Thrissur

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14.1 Objectives of the Lesson

- To understand the concepts, characteristics and importance of motivation
- To explain the process, elements and factors influencing the motivation process
- To explore the various types and theories of motivation
- To identify and understand the techniques and methods of motivating farmers

14.2 Glossary

Motivation is the goal directed need satisfying behaviour is called motivation.

Motive is the desire or want that energizes and directs goal-oriented behavior

Tension is a condition when a need or motive remains unsatisfied or unaccomplished

Goals are the ends which provide satisfaction of human wants.

A need is a condition of lack or deficit of something required by the organism

Intrinsic motivation is internal or self-driven and is when a person acts without expecting to be rewarded

Extrinsic motivation is external or other-driven, where a person expects to be rewarded

Physiological needs are the basic needs for sustaining human life itself

Achievement need is the need for competitive success measured against a personal standard of excellence

Self-actualisation means becoming everything one is capable of, or becoming what he can, that is, fulfillment of his basic potentialities

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14.3 meaning and concept of motivation

Motivation is defined as the drive, urges and action towards goal-directed behavior. Motivation used to explain behavior which gives the reasons for people's actions, desires, and needs.

Motivation can also be defined as one's direction to behavior or what causes a person to want to repeat a behavior and vice versa.

The word 'motivation' has its origin in the Latin word *'movere,'* meaning "to move". Psychologically, it means an inner or environmental stimulus to action, forces or the factors that are responsible for behavioural action and reaction.

A motive is what prompts the person to act in a certain way, or at least develop an inclination for specific behavior

- ✓ internal state or condition that activates behavior and gives it direction;
- ✓ desire or want that energizes and directs goal-oriented behavior;
- ✓ influence of needs and desires on the intensity and direction of behavior.

Motivation is the process of initiating a conscious and purposeful action

Motive means an urge (drive or force) or combination of urges, to induce conscious or purposeful action.

Motivation is a goal directed and need satisfying behavior. It explains

- ✓ why people do the things they do. It influences a person to do a thing in a certain way.
- ✓ Motive is something (a need or desire) that causes a person to act.

Motivation may be defined as goal seeking or goal directed behavior or activity. Behavior is a function of the person, which is interaction within a situation

Motivation is also defined as a stage of the organism in which bodily energy is mobilized and selectively directed towards parts of the environment

According to Joe Kelly, "Motivation is a process whereby needs instigate behavior directed towards the goals that can satisfy those needs."

According to W. G. Scot, "Motivation means a process of stimulating people to action to accomplish the desired goals."

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According to Michael J. Jucius, "Motivation is the act of stimulating someone or oneself to get a desired course of action, to push the right button to get a desired result."

14.3.1 Characteristics of Motivation

1. Motivation is a psychological phenomenon. Motivation is an internal feeling which means it cannot be forced on farmers. The internal feelings such as need, desire, aspirations etc. influence human behavior to behave in a particular manner. For example, desire to have a new farm implement, respect and recognition etc.

2. Motivation produces goal directed behavior. Motivation induces people to behave in such a manner so that they can achieve their goal. Motivated person need no supervision or direction. He will always work in desired manner. For example, a farmer has a motive to get recognition of best farmer so he will work efficiently to get the award.

3. Motivators can be positive as well as negative. A positive motivation promotes incentives to people while a negative motivation threatens the enforcement of disincentives. Promotion, increment, bonus, respect, recognition etc. are positive motivation whereas warning, issue o memo, demotion; stopping increments etc. are negative motivation. Sometimes fear of negative motivators also induces person to behave in a desired manner.

4. Motivation is a complex process. Motivation is a complex and difficult task. Some get satisfied with monetary incentives, some with non-monetary, some with positive and some with negative motivators. So it is not possible to make generalization in motivation.

5. Motivation is a dynamic and continuous process. Because human wants are unlimited, therefore motivation is an ongoing process.

6. Motivation is a personal and internal feeling. Motivation is a psychological phenomenon which generates within an individual.

7. Motivation is a planned process. People differ in their approach, to respond to the process of motivation; as no two individuals could be motivated in an exactly

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similar manner. Accordingly, motivation is a psychological concept and a complex process.

14.3.2 Functions of motivation

1. Motives encourage a learner in his learning activities. For example, extrinsic motives like prizes, medals etc., motivate children.

2. Motives act as selectors of the type of activity in which the person desires to engage. For example, Selection of courses for training

3. Motives direct and regulate behaviour. For example, discipline in schools etc.

4. Motivation is concerned with the arousal of interest in learning. This forms the basis for learning.

14.3.3 Importance of motivation in agricultural extension:

Motivation is necessary for mobilising the village people. Most of the development programmes could not bring the desired results because there was no motivation. Both the extension workers and rural people are to be motivated to achieve the results.

Motivation brings need based approach. It is possible for the extension workers to motivate the people to satisfy the five categories of needs. If there is a desire for security, the farmers can be motivated to adopt new practices by convincing them that the new practice will increase their income and enhance their security. If they have a desire for new experience, the extension teaching is oriented towards impairing new skills. Similarly, other desires can be met with.

Motivation helps for the better involvement of farmers in development programmes.

The role of audio-visuals in motivating farmers needs no emphasis. The proper selection, combination and use of various audio-visuals for the appropriate purpose will act as lubricants for motivation.

Various studies conducted in India indicate that economic motivation is much predominant followed by innovativeness. Among the economic motives, providing

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better food, clothing and educating for one's children seem to be the dominant movies.

The job of the extension worker is to understand the basic wants or incentives of the people with whom he is working. He should show the learner how to satisfy these basic wants by learning new things (i.e. by adopting new methods or practices)

The extension worker should find the personal goals of the learner and tie with his teaching goals. When people are shown how learning a subject will enable them to gratify (satisfy) a desire or realize a need, they are being motivated to learn

14.4 Process of Motivation

The process of motivation comprises different steps, within an individual, which are explained hereunder:

1. Motive: A motive is the actual driving force that enables an individual to perform any task to achieve his goal. This is the starting point of the motivation process.

2. Tension: The second step in this process is the "Tension" When a need or motive remains unsatisfied or unaccomplished; it results in a stimulus within an individual as to how I can do this.

3. Search: Once an individual enters the phase of Tension, it immediately takes him to the third step of the process of motivation, "Search". The individual instantly starts searching as to how he can complete this task.

4. Action: The last step may be termed as "Action". Action is the logical accomplishment of the first three steps. After going through the phase of Motive, Tension and Search, the ultimate result Action, takes the individual towards successful achievement of Goal that fulfills his motives.

5. Feedback: The final step in the process of motivation is "Feedback". This is extremely important for the extension organization or institution to get feedback

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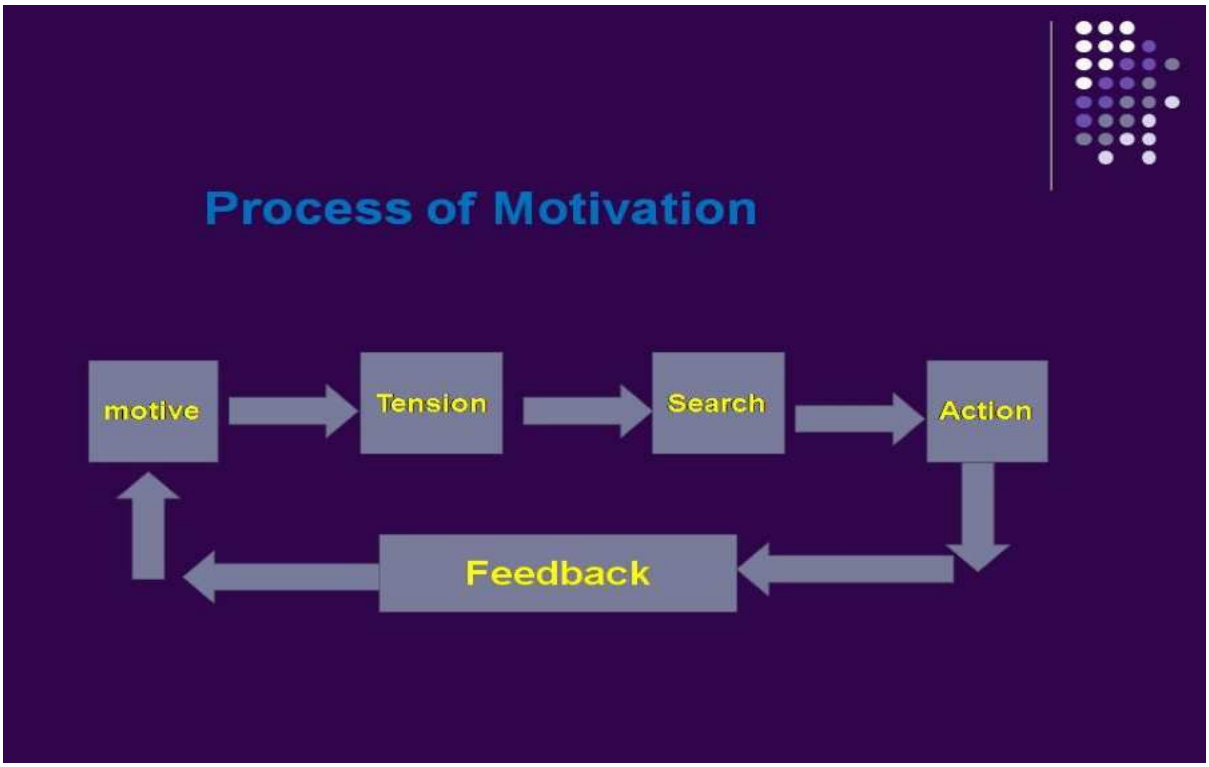
from the farmers, farm women and youth in order to formulate and upgrade its line of action to improve the work environment and motivational level.

Fig 14.1 process of motivation



Process of Motivation may include six steps which consist following elements:

1. Unsatisfied need. Motivation process begins when there is an unsatisfied need in a human being.

2. Tension. The presence of unsatisfied need gives him tension.

3. Drive. This tension creates an urge of drive in the human being an he starts looking for various alternatives to satisfy the drive.

4. Search Behavior. After searching for alternatives the human being starts behaving according to chosen option.

5. Satisfied need. After behaving in a particular manner for a long time then he evaluates that whether the need is satisfied or not.

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6. Reduction of tension. After fulfilling the need, the human being gets satisfied and his tension gets reduced.

For example, if an employee develops a need to earn more, this need will make him restless and he will start thinking how to satisfy his need. To satisfy his need he may think of working hard in organization and get promotion so he will start working hard. After sometime he will get incentives or increments or promotion which will satisfy his need.

But motivation process does not end by satisfaction of one need. After fulfilling one need another need develops and the same process continues till needs keep emerging in human beings.

14.4.1 Elements of Motivation

Motivation concerns those processes which produces goal-directed behavior. The basic elements of the process of motivation are:

1. Behavior: All behaviour is a series of activities. Behaviour is generally motivated by a desire to achieve a goal. In order to predict and control behaviour managers must understand the motives of people.

2. Motives: Motives prompt people to action. They are the primary energizers of behaviour. They are the 'ways' of behaviour and mainsprings of action. They are largely subjective and represent the mental feelings of human beings. They are cognitive variables. They cause behaviour in many ways. They arise continuously and determine the general direction of an individual's behavior.

3. Goals: Motives are directed toward goals. Motives generally create a state of disequilibrium, physiological or psychological imbalance, within the individuals. Attaining a goal will tend to restore physiological or psychological balance. Goals are the ends which provide satisfaction of human wants. A need can be satisfied by several alternate goals.

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4. Intensity: It describes how hard a person tries. This is the element most of us focus on when we talk about motivation.

5. Direction: High intensity is unlikely to lead to favorable job-performance outcomes unless the effort is channeled in a direction that benefits the organization. Therefore, the quality of effort as well as its intensity matters. Effort directed toward, and consistent with, the organization's goals is the kind of effort once should be seeking.

6. Persistence: It measures how long a person can maintain effort. Motivated individuals stay with a task long enough to achieve their goal.

14.4.2 Some concept related to Motivation

i. Needs and Motives

A need is a condition of lack or deficit of something required by the organism. In order to maintain homeostasis or balance the organism finds it necessary to satisfy the needs.

The needs are of different types. The need for food or water is a physiological need, which arises out of lack or deficit of food or water in the organism. The need for contact with other persons is a social need. The other social needs include need for prestige, status, affection, self-esteem, and so on.

A person becomes more aware of his needs when they are not fulfilled. In other words, when you are hungry, you need food, and, when you are thirsty you need water. In these cases you are in a state of deprivation and your bodily system suffers from some kind of imbalance.

The needs may be broadly categorised as, primary or physiological needs and secondary or social needs. Needs for food, water, sex, sleep and rest, and elimination are primary needs. Needs for achievement, affiliation, power are examples of social needs.

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Needs may be divided into two broad catagories viz;biological needs and socio-psychological needs

The term 'motive' refers to goal directed behaviour and energising conditions within the organism that drive behaviour. It is generally used to refer to certain conditions which, besides arousing, predispose a person to respond, or behave in a way appropriate to that motive. Motives direct the activity of the individual towards person's goals.

ii. Goals

Thinking about the goal motivates a person to organize his or her action. If hunger is a need, eating food is a goal. Thus goal is related to the need state. However, in certain cases, behaviour is also guided by intrinsic goals. goal of the farmer to enhance productivity.

It means behaviour does not always need external goal. It may be satisfying and enjoyable in itself. Some people may like to sing, dance or play just for the sake of singing, dancing or playing. They like such activities. Thus goals can be intrinsic or extrinsic.

iii. Incentives

Incentives refer to the goal or objects which satisfy the needs. Incentives vary in quality and quantity which make them less or more satisfying and attractive. Thus one can put in greater amount of effort to attain a more attractive incentive. As a matter of fact, many incentives assume considerable significance in the lives of people and they do everything possible to attain those incentives.

iv. Instincts

It is defined as an innate biological force that predisposes the organism to act in a certain way. At one time all behaviours were supposed to be results of certain instincts. Some of the instincts identified by early psychologists are fight,

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repulsion, curiosity, self-abasement, acquisition etc. for instance some farmers may always curious about innovative techniques

It was thought that instincts were inherited and compelling sources of conduct, but can be modified by learning and experience. This term is no more used in relation to human behaviour. Animal behaviour is sometimes explained using this term. In current usage 'instinct' is reserved for innate response tendencies found among animals.

v. Needs which motive human beings

a. Organic needs or physiological motives:

Man is constructed in such a way that he requires certain basic things for his living. He is also constituted that these needs initiate activity that will eventually satisfy them. These are all the basic organic needs which demand periodic or continual satisfaction. These needs are called appetites. For example, breathing air; appetite of thirst, appetite for sleep or rest etc.

b.Wants

People have unique personal wants. For example, Likes and dislikes for specific food; play etc.,

c. Emotions as motives

Under the influence of fear, anger etc., people may do many things they would not do normally. For example, Parents use fear to direct the behaviour of children. Organisations use fear to produce a desired form of behaviour.

d. Feelings and attitudes as motives

An individual's experience activity is evaluated by him as pleasant or unpleasant. When the experience is pleasant, individual has an attitude or approach to that experience and if it is unpleasant, his attitude is withdrawal.

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e. Social motives

Most people have a strong desire to achieve social approval. For this, they try to improve their personality through clothes, possession of things, knowledge, skills etc.

f. Others

Habit: Somebody's settled practice, especially something that cannot easily be given up. Established habit becomes almost automatic and requires only a stimulus to set it in action.

Objective environment: People act differently in different situations. The objective environment produces a 'set' or 'readiness' to respond in a particular way.

14.5 Types of Motivation

Generally speaking, there are two main kinds or components of motivation: Intrinsic motivation and extrinsic motivation

Motivation can be divided into two different theories known as intrinsic (internal or inherent) motivation and extrinsic (external) motivation.

Intrinsic motivation are self-generated factors (responsibility, freedom to act, scope to use and develop skills and abilities, interesting and challenging work, opportunities for advancement) – they have a deeper and longer-term effect

Extrinsic motivation means what is done for people to motivate them (rewards, promotion, punishment) – they have an immediate and powerful effect, but won't necessarily last long

In other words: Intrinsic motivation comes from a person's internal desire to do something. Reasons may be that a particular activity gives him or her pleasure, helps to develop a particular skill of seems to be the right thing to do in moral / ethical terms. Extrinsic motivation is generated by external factors that are less related to the particular task.

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Intrinsic motivation is internal or self-driven and is when a person acts without expecting to be rewarded, while extrinsic motivation is external or other-driven, where a person expects to be rewarded

External motivators include things like deadlines and money. Internal motivators are personal factors, such as a passion for a subject or career choice, a desire to help others, or even just enjoyment of the work itself.

Internal and external motivations are further divided into multiple categories positive, negative, financial, non-financial motivations.

1. Positive and Negative Motivation

Positive motivation is when we do something because it makes us feel good and boosts our mood. Negative motivation happens when we want to avoid a feeling or situation that would be unpleasant.

For example, as a farmer it may be hard to concentrate in demonstration because you feel it is not at all help for your crop, or you may eagerly be listening in the training because you want to learn more enthusiastically.

2. Financial and Non-Financial Motivation

If famers or extension workers are motivated for financial gain or non-financial sources like status, self-esteem it may refer as Financial and Non-Financial Motivation

3. Biological and Social motivation

Biological motivation are motives of physiological needs like hunger motivation, thirst motivation etc where as Social motivation--achievement motivation, power motivation.

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14.5.1 Others Types of Motivation

1. Achievement Motivation: It is the drive to pursue and attain goals. An individual with achievement motivation wishes to achieve objectives and advance up on the ladder of success.

2. Affiliation Motivation: It is a drive to relate to people on a social basis. Persons with affiliation motivation perform work better when they are complimented for their favorable attitudes and co-operation.

3. Competence Motivation: It is the drive to be good at something, allowing the individual to perform high quality work. Competence motivated people seek job mastery, take pride in developing and using their problem-solving skills and strive to be creative when confronted with obstacles. They learn from their experience.

4. Power Motivation: It is the drive to influence people and change situations. Power motivated people wish to create an impact on their organization and are willing to take risks to do so.

5. Attitude Motivation: Attitude motivation is how people think and feel. It is their self-confidence, their belief in themselves, their attitude to life. It is how they feel about the future and how they react to the past.

6. Incentive Motivation: It is where a person or a team reaps a reward from an activity. It is "You do this and you get that", attitude. It is the types of awards and prizes that drive people to work a little harder.

7. Fear Motivation: Fear motivation coercion's a person to act against will. It is instantaneous and gets the job done quickly. It is helpful in the short run.

14.6 Theories of motivation

The theories of motivation provide general sets of principles to guide our understanding of the drives, motives, urges, wants, needs, desires, strivings and goals that come under the heading motivation. There are different views on motivation. These views are explained as theories of motivation.

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14.6.1 Drive reduction theory

Drive-reduction theory was proposed by a psychologist named Clark L. Hull in 1943. The theory is founded on the idea that motivation comes from the body's physiological need to maintain homeostasis and equilibrium in all functions and systems. Basically, this means that the body leaves a state of equilibrium or balance whenever there is a biological need; this creates a drive for certain behavior.

These may be described as push theory of motivation. Drive theory explain Drive-Reduction--internal tensions "push" toward satisfying basic needs.

Eating when you are hungry, sleeping when you are tired, and drinking when you are thirst are examples of motivation based on drive-reduction theory. In this example, hunger, fatigue, and thirst create an instinctual drive that the body must reduce in order to reach the goal of maintaining homeostasis.

14.6.2 Incentive theory

Incentive theory is based on the beliefs of motivational values mainly based on two types of incentives Intrinsic and Extrinsic

Incentive theory treats motivation and behavior of the individual as they are influenced by beliefs, such as engaging in activities that are expected to be profitable. Incentive theory is promoted by behavioral psychologists, such as B.F. Skinner.

Incentive theory is especially supported by Skinner in his philosophy of Radical behaviorism, meaning that a person's actions always has social ramifications: and if actions are positively received people are more likely to act in this manner, or if negatively received people are less likely to act in this manner.

Incentive theory distinguishes itself from other motivation theories, such as drive theory, in the direction of the motivation. In incentive theory, stimuli "attract", a person towards them, and push them towards the stimulus.

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In terms of behaviorism, incentive theory involves positive reinforcement: the reinforcing stimulus has been conditioned to make the person happier. As opposed to in drive theory, which involves negative reinforcement: a stimulus has been associated with the removal of the punishment—the lack of homeostasis in the body.

For example, a person has come to know that if they eat when hungry, it will eliminate that negative feeling of hunger, or if they drink when thirsty, it will eliminate that negative feeling of thirst

14.6.3 Opponent-Process Theory

Richard Solomon (1980) has developed a theory of motivation/emotion that views emotions as pairs of opposites (for example, fear-relief, pleasure-pain etc). The opponent-process theory states that when one emotion is experienced, the other is suppressed.

For example, if you are frightened by a mean dog, the emotion of fear is expressed and relief is suppressed. If the fear-causing stimulus continues to be present, after a while the fear decreases and the relief intensifies.

For example, if the dog didn't move, your fear would decrease and relief that the dog didn't attack would increase. If the stimulus is no longer present, then the first emotion disappears and is replaced totally with the second emotion. If the dog turns and runs, you are no longer afraid, but rather feel very relieved.

Solomon and Corbit (1974) analyzed the emotions present when skydivers jump from planes. Beginners experience extreme fear as they jump, which is replaced by great relief when they land. With repeated jumps, the fear decreases and the post-jump pleasure increases.

This process may explain a variety of thrill-seeking behaviors. It has also been proposed as a model of drug addiction. The drug initially produces pleasurable feelings, but then a negative emotional experience occurs. Eventually, the drug

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user takes drugs not for their pleasurable effects, but to avoid withdrawal symptoms.

The opponent-process theory is an attempt to link emotional states with motivation. Although it is an intriguing idea, some researchers have not found support for the opponent-process theory.

14.6.4 Optimal-level Theory

This is also called as theory of homeostasis. Claud Bernard coined the word homeostasis to explain the state of equilibrium in the body. This is a 'hedonistic' (hedonism- doctrine that happiness is the highest good) theory which says that, there is a certain optimal level for normal functioning of the body.

Maintenance of optimal level leads to equilibrium which gives pleasure. Disequilibrium leads to displeasure. Hence, every individual strives to avoid disequilibrium by maintaining optimal level of the needs like food, water, body temperature, etc.

14.6.5 Psychoanalytic Theory or Instinct theories

This theory which has been explained by Sigmund Freud, deals with unconscious motivation. According to Freud, the inborn tendencies called instincts influence our behaviour. There are two groups of instincts with opposite nature:

i. Life instincts (Eros): these instincts have the life energy called Libido-which motivates the individual towards constructive activities like love, sympathy/helping others, etc.

ii. Death instincts (Thanatos)-motivate the individual for destructive activities like murder, suicides, aggression, attack, etc.

Freud has emphasised that the unconscious motives play more dominant role in determining our behaviour, than conscious or preconscious. He pointed that, our actions are determined by our unconscious motives.

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According to him, our unconscious mannerisms, slips of tongue and pen, phobias are the result of these hidden motives. These hidden motives may also drive the people towards various psychosomatic disorders like chronic headaches, insomnia, gastric troubles, etc. Our motives also appear in the form of dreams according to Freud.

14.6.6 The Needs (content) Theory

Need is the lack of something. All Needs theories focus on specific needs people want to satisfy. There are several theories that explain motivation as a result of these needs.

The underlying concept is the belief that an unsatisfied need creates tension and a state of disequilibrium. To restore balance, a goal is identified that will satisfy the need and a behavior pathway to this goal is selected.

All behavior is motivated by unsatisfied needs. People will be better motivated if their work experience satisfies their needs and wants.

Needs theories distinguish between primary needs, such as food, sleep and other biological needs, and secondary psychological needs that are learned and vary by culture and by individual.

14.6.7 Humanistic Theory

This theory believes in striving tendency of the individual for realizing his potentialities, especially creative ones, strengthening self-confidence and attaining the ideal self. There are two important persons related to this theory—Abraham Maslow and Carl Rogers.

These are:

- ✓ Biological motives like hunger, thirst, etc.
- ✓ Safety and security needs like protection from external threats etc.
- ✓ Love and belongingness needs like Affection, warmth, etc.
- ✓ Esteem needs like self-esteem, respect, approval, etc.

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- ✓ Self-actualisation motive i.e. achieving maximum development of one's potentialities).

Maslow has explained that every individual struggles to fulfil basic needs first, and then followed by safety, love, esteem and finally actualisation needs.

According to him the needs at one level should be satisfied at least partially, before the next level needs become active. Most of the people end their struggle to reach third or fourth level needs. Only a few will aspire for self-actualisation which is the ultimate goal of life.

Self-actualisation means becoming everything one is capable of, or becoming what he can, that is, fulfillment of his basic potentialities. Maslow explains that the self-actualised people experience, what he calls the 'peak experiences', when they fulfill the need for self-actualisation (The triangular Figure 4.1 signifies the decreasing size of population in their effort to fulfil the higher order needs).

Carl Rogers, as a humanist believes in the strength and potentialities of human beings. According to him all human beings have a natural inclination for learning and a desire to grow and progress known as self-actualizing tendency.

Every individual will strive to realise his potentialities and to grow to become a fully functioning person. Hence in the view of Rogers, the motivation for self-growth and becoming a fully functioning person are important concepts

14.6.8 Hierarchy of Needs Theory

It is one of the most widely accepted theories of motivation developed by psychologist Abraham Maslow. It also called as Maslow's Self-actualization Theory.

Maslow saw human needs are in the form of a hierarchy, ascending from the lowest to highest and he concluded that when one set of needs was satisfied, people drives for higher need.

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1. Physiological Needs: These are the basic needs for sustaining human life itself, such as food, water, shelter, and sleep. Until these needs are satisfied other needs will not motivate people.

2. Security or Safety Needs: These are the needs to be free of physical danger and the fear of loss of a job, property, food or shelter.

3. Affiliation or Acceptance Needs: Since people are social beings, they need to belong, to be accepted by others.

4. Esteem Needs: According to Maslow, once people begin to satisfy first three types of needs, they tend to want to be held in esteem both by themselves and by others. This kind of need produces such satisfactions as power, prestige, status and self-confidence.

5. Need for Self-actualization: Maslow regards this as the highest need in his hierarchy. It is the desire to become what one is capable of becoming - to maximize one's potential and to accomplish something. Selfactualization can never be completely fulfilled by the general people.

Fig 14.2 Maslow Need Hierarchy Theory

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If a lower need is satisfied, it no longer motivates behavior; the next higher one becomes dominant. It follows the deficit principle.

The five needs exist in a hierarchy. Higher needs only become important when lower needs are satisfied

Higher-order needs provide greater motivation. Different people may have different priorities. The theory helps extension personnel to identify which particular needs are relevant for employees and thus to determine appropriate motivators.

14.6.9 Theory X and Theory Y

The Theory X and Theory Y are the theories of motivation given by Douglas McGregor in 1960's. Douglas McGregor formulated two distinct views of human being based on participation of workers. The first basically negative labeled as Theory X, and the other basically positive, labeled as Theory Y.

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McGregor believed that management can use either of the needs to motivate his employees, as grouped under theory X and theory Y.

Theory X: Theory X relies on the authoritarian style of management, where the managers are required to give instructions and keep a close check on each employee. As it is assumed, the employees are not motivated, and they dislike working.

Theory X is based on the following assumptions:

1. The employee is lazy and dislikes work.

2. He is not ambitious and dislikes responsibility and therefore prefers to be led.

3. The employee is self-centered and indifferent towards the organizational interest.

4. Management is responsible for assembling all the factors of production, Viz. Money, material, equipment, and people.

5. The managers are required to control his employees, manage their efforts, motivate them, and modify their behavior to comply with the organizational needs.

6. The management must intervene to keep the employees working towards the economic ends. The employees must be persuaded, rewarded, motivated, punished, controlled to get the work completed.

Theory Y: Theory Y relies on the participative style of management, where the managers assume that the employees are self-directed and self- motivated to accomplish the organizational objectives. Thus, here the management attempts to get the maximum output with least efforts on their part.

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Following are the assumptions of Theory Y:

1. The average human being does not inherently dislike work, they are creative and self-motivated and likes to work with greater responsibilities.

2. Employees are self-directed and self-controlled and therefore the threat of punishment is not only the means for getting the desired results.

3. The extent to which an employee is committed to objectives is determined by the rewards associated with their achievement. The most significant rewards in this context could be the satisfaction of the ego and the fulfillment of self-actualization needs.

4. The average human being is ambitious and is ready to take responsibilities. He likes to lead rather than to be led by others.

5. The employees exercise a relatively high degree of imagination and creativity in solving the complex organizational problems.

Thus, theory X and theory Y are two contrasting models that depict the set of assumptions a manager holds on his employees, which may or may not coincide with their general way of behaving. Therefore, these theories are based on the attitude, not attributes

14.6.10 Alderfer's ERG Theory

Is based on Maslows Hierchy of needs; recategorizes Maslows categories of needs into three simpler and broader groups:

Existence needs – need for material and energy exchange; basic physiological and safety needs

Relatedness needs – transactions with human environment, process of sharing or mutuality; need for interpersonal relationships and attention; is about equivalent to Maslows social needs and part of the esteem needs

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Growth needs – people make creative or productive efforts for themselves; need for personal growth and self-development; part of Maslows esteem needs and self-fulfillment needs

On contrast to Maslow, here more than one level of needs can be relevant at the same time. There is no hierarchy; people may for instance work to fulfill their personal growth needs, whereas not all relatedness needs are fulfilled

14.6.11 Herzbergs two-factor model

There are some factors that result in satisfaction and some factors that just prevent dissatisfaction. According to Herzberg, the opposite of Satisfaction is No Satisfaction and the opposite of Dissatisfaction is No Dissatisfaction.

Motivators – factors that really motivate people, also called satisfiers, provide intrinsic motivation. Examples for Motivators: recognition, growth and career development opportunities, responsibility, autonomy, self-fulfillment

Hygiene factors – dissatisfiers; their absence would demotivate people, but their presence not necessarily improves motivation; essentially describe the environment, little effect on positive job attitudes. Examples for Hygiene factors: salary, work conditions, relationships with superios and peers, company policy

14.6.12 McClelland needs Theory of Motivation

Davids McClelland has identified three types of basic motivating needs. He classified them as need for power (n/PWR), need for affiliation (n/AFF) and need for achievement n ACH).

Need for Power

McClelland and other researchers have found that people with a high need for power motivation possess the following qualities.

- ✓ They have a great concern for exercising influence and control over others.
- ✓ They are seeking positions of leadership.

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- ✓ Good conversationalists
- ✓ They are forceful, outspoken and often argumentative.
- ✓ They enjoy public speaking etc.

Need for Affiliation

People with a high need for affiliation motivation possess the following qualities.

- ✓ They derive pleasure from being loved.
- ✓ Maintain pleasant social relationships with others.
- ✓ Enjoy a sense of intimacy and understanding.
- ✓ Ready to console and help others in trouble.
- ✓ Enjoy friendly interaction with others etc.

Need for achievement

People with a high need for achivement motivation possess the following qualities.

- ✓ They have an intense desire for success as well as equally intense fear of failure.
- ✓ They set moderately difficult goals.
- ✓ Take a realistic approach to risk.
- ✓ Prefer to analyse and assess problems.
- ✓ Tend to be restless and like to work long hours.
- ✓ Do not worry if failure occurs.
- ✓ Like specific and prompt feedback on how they are doing etc.

McClelland's need-theory is closely associated with learning theory, because he believed that needs are learned or acquired by the kinds of events people experienced in their environment and culture.

14.7 Techniques and Methods of motivation

Motivation act as facilitating, catalyzing, influencing and energizing ways to achieve the goal of institution, organization. Extension system consists of

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extension personnel as well as clientele like farmer, farm women, youth, SHG, FIG, etc.

14.7.1 Techniques for motivating/influencing farmer's behaviour

Rural development and agricultural development mainly depend on motivation of farmers and stakeholders involved. There are various techniques and methods to motivating the farmers as well as extension personnel to increase the production and productivity of organization and farming communities.

Van den Ban and Hawkins (1988) suggested the following techniques for influencing human behavior in a social system.

i. Compulsion

In this case, power is exerted by an authority, forcing the farmers or people to do something. Certain laws and legal provisions come in this category. For example, our government can give appropriate directions that the farmers must grow eco-friendly tree species for the protection of environment and soil erosion.

This method can also be used in preventing the farmers from taking rotation like wheat-rice rotation in Punjab, Haryana etc. But this method is not suitable for changing the behaviour which requires initiation on the part of the people.

ii. Exchange

In this method, goods or services are exchanged between the two individuals / parties or organizations. For instance, state government can motivate the farmers to grow multi-purpose tree species by providing marginal land free of cost or at minimal charges through a mechanism of mutual benefit sharing.

iii. Advice

In this method of influencing the behaviour, advice is given for choosing solution to a problem. But the extension worker must have adequate information about the farmers' problems and their solutions. The farmers should also have

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confidence in the competency of the extension worker besides sufficient means at their disposal to follow the advice.

iv. Openly influencing a farmer's knowledge and attitude

This method may be used when we believe that the farmers can not solve their own problems due to insufficient or incorrect knowledge or unmatched attitude with their goals. Farmers should trust our expertise and motives and must be prepared to cooperate with us in our task of changing their knowledge or attitudes.

Long term behavioural changes are possible by using this method. Moreover, farmers' self-confidence and capacity to solve other similar problems by themselves in future are increased.

v. Manipulation

In this case, the farmers' knowledge level and attitude are influenced without their being aware of it. This method is used when we believe that it is necessary and desirable for the farmers to change their behaviour in a certain direction. The farmers should not actively object to being influenced in this way and we think that it is unnecessary or undesirable for the farmers to make independent decisions.

For example, by showing the documentary on 'global warming, climate change and deforestation', we may motivate the farmers indirectly for afforestation, i.e. manipulating them to grow more trees. This method can also be used for promoting the adoption of technology

Sagar Mondal (2014) has also suggested various methods motivation techniques for rural people which are given below;

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i. Demonstration

Different method of demonstration like result demonstration, method demonstration, frontline demonstration need to be organized which may be the best techniques to motivate the rural people to adopt new technologies.

ii. Training

Knowledge, skill and attitude may be changed through the motivation of their goal and action.

iii. Providing stimulus or incentives

Awards, rewards and recognition act as vital motivators for the farming communities. For example, recognition of best progressive farmer in the kisan mela, exhibition may motivate the famer to enhance their productivity.

iv. Use of audio-visual aids

Audio-visual aids enhance the learning capabilities of learner hence energise and drive the instinct of the rural people to adopt new ideas, techniques, and practices.

v. success story

Visualising success of others would create an intrinsic motivation among the farmer to act towards desire goal.

vi. Economic gain

Financial motivation may increase the interest of the rural people for rural development.

14.7.2 Techniques of motivation for extension personnel

1. Financial incentives: First techniques of motivation are financial incentives as money is indicator of success. Therefore, it fulfills psychological safety and status

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need as people satisfy their needs by money. Wages, salary motivates employees to perform better.

2. Job enlargement: Under this technique, task assigned to do job are increased by adding simile task. So the scope of job enlargement is high for the motivation of subordinates. It is also known as horizontally leading of job.

3. Job enrichment: Under this technique jobs are made challenging and meaningful by increasing responsibility and growth opportunities. In such technique of motivation, planning and control responsibility are added to the job usually with less supervision and more self-evaluation. It is also called vertical leading.

4. Job rotation: it refers to shifting an employee from one job to another. Such job rotation doesn't mean hanging of their job but only the employees are rotated. By this it helps to develop the competency in several job which helps in development of employees.

5. Participation: Participation refers to involvement of employee in planning and decision making .it helps the employees feel that they are an asset of the organization which helps in developing ideas to solve the problems.

6. Delegation of authority: Delegation of authority is concerned with the granting of authority to the subordinates who helps in developing a feeling of dedication to work in an organization because it provides the employees high morale to perform any task.

7. Quality of work life: It is the relationship between employees' and the total working environment of organization. It integrates employee needs and wellbeing with improves productivity, higher job satisfaction and great employee involvement. It ensures higher level of satisfaction.

8. Management by objectives: It is used as a motivation and technique for self control of performance. By this technique superior and subordinates set goals and

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each individual subordinates responsibilities clearly defined which help to explore the sill and use in the organization effectively.

9. Behavior modification: The last technique of motivation is behavior modification. It develops positive motivation to the workers to do the work in desired behavior in order to modify behavior.

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Course Name	Fundamentals of Extension Education
Lesson 15	Management and Administration: Meaning, Principles and Functions
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
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15.1Objectives of the Lesson

- To understand the meaning, concepts and nature of management and administration
- To find out the basic functions and principles of management
- To identify the basic functions and principles of extension administration
- To explore the characteristics and elements of extension management
- To understand the meaning, concept and features of extension organisation

15.2 Glossary

Management is the process of organising, designing and maintaining an conducive environment in which individuals working together to accomplish desire goal

Administration can be defined as the guidance leadership and control of the efforts of a group of individuals towards some common goal.

Extension administration is the process through which agriculture and allied departments can implement development projects and programmes by performing managerial functions

Organization is the process of identifying and grouping work to be performed, defining and delegating responsibility and authority and establishing relationships

Planning is deciding in advances what to do, how to do it, when to do it and who should do it.

Principle of hierarchy is also known as the 'Scalar process', where in lines of positional authority and responsibility run upward and downward through several levels

Authority is defined as the right to give orders and the power to exact obedience.

Controlling is the function that evaluates quality in all areas and detects potential or actual deviations from the organization plan

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15.3 Meaning and concepts of Management

Management is the process by which various resources are combined and coordinated so as to effectively achieve organizational objectives

The term management stems from, the word *manage* which in turn, is derived from the French word *ménage* meaning 'housekeeping'.

In general usage, the word management identifies a special group of people whose job is to direct the effort and activities of other people toward common objectives.

Knootz and Weihrich (1988) conceptualized management as the process of designing and maintaining an environment in which individuals, working together in groups, accomplish efficiently selected aims. It means that

- ✓ As managers, people carry out the managerial functions of planning, organizing, staffing, leading and controlling.
- ✓ Management applies to any kind of organization.
- ✓ It applies to managers at all organizational levels;
- ✓ The aim of all managers is the same to create a surplus.
- ✓ Managing is concerned with productivity which implies efficiency and effectiveness

George R Terry defines management as "a process consisting of planning, organizing, actuating and controlling performed to determine and accomplish the objectives by the use of people and resources". According to him, management is a process-a systematic way of doing thing using four managerial functions namely planning, organizing, actuating and controlling.

According to Koontz and O'Donnel, "Management is the direction and maintenance of an internal environment in an enterprise where individuals working in groups can perform efficiently and effectively towards the attainment of group goals".

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15.4 Characteristics of Management

1. Management is goal and objective oriented process:

Management always aims at achieving the organisational objectives. The functions and activities of manager lead to the achievement of organisational objectives

2. Management is pervasive in nature:

Management is a universal phenomenon. Concept of management is used in the whole world and almost every sector. The use of management is not restricted to business firms only it is applicable in profit-making, non-profit-making, business or non-business organisations; even in other sectors like hospital, school, club and house has to be managed properly.

3. Management is multidimensional:

Management does not mean one single activity but it includes three main activities:

i. Management of work: All organisations are set up to perform some task or goal. Management activities aim at achieving goals or tasks to be accomplished. Management makes sure that work is accomplished effectively and efficiently.

ii. Management of people: People refer to Human resources and Human resources are the most important assets of an organisation. An organisation can win over competitor with efficient employees only because two organisations can have same physical, technological and financial resources but not human resources.

iii. Management of operations: Management of operations concentrates on mixing management of work with management of people, i.e., deciding what work has to be done, how it has to be done and who will do it.

4. Management is a continuous process:

Management is a continuous or never ending function. All the functions of management are performed continuously, for example planning, organising, staffing, directing and controlling are performed by all the managers all the time

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5. Management is a group activity:

Management always refers to a group of people involved in managerial activities. The management functions cannot be performed in isolation. Each individual performs his/her role at his/her status and department, and then only management function can be executed.

6. Management is a dynamic function:

Management has to make changes in goal, objectives and other activities according to changes taking place in the environment. The external environment such as social, economical, technical and political environment has great influence over the management.

7. Management is intangible:

Management function cannot be physically seen but its presence can be felt. The presence of management can be felt by seeing the orderliness and coordination in the working environment.

8. Composite process:

Management consists of series of functions which must be performed in a proper sequence. These functions are not independent of each other. They are inter-dependent on each other. All the functions inter-dependent on each other that is why management is considered as a composite process of all these functions.

9. Balancing effectiveness and efficiency:

Effectiveness means achieving targets and objectives on time. Efficiency refers to optimum or best utilisation of resources. Managements always try to balance both and get the work done successfully.

10. Improving in three key skills:

Management concerned with the three basic skills viz; conceptual skills, technical skills and human resource skills.

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15.5 Function of Management

Gulick first used the acronym 'POSDCORB' and UR wick (1987) to explain the seven process of administration/management planning, organizing, staffing, directing, coordinating, reporting and budgeting. These processes can explain the total working or management conditions of an institution.

This theory has basic assumption that the development processes and goals of the individual and his organization are at crucial points and fundamentally different. This is an antagonistic trend. The fusion theory is depicted as under.

Agricultural sector being an important part of the economy must have professional scientist's/technocrats managers. This has to come by educational training designs aimed at preparing agricultural scientists for the top leadership and overall management.

The important management functions are planning, organizing, motivating and controlling and these are central to any discussion of management. These functions which constitute the management process (a step by step doing something) are relevant regardless the type of organization or level of management. The management process is briefly described as under.

1. Planning: It involves setting goals and objectives for the organization and developing work maps showing how these goals and objectives are to be accomplished. Planning includes both the broadest view of the organization, i.e. its mission, and the narrowest, such as a tactic for accomplishing a specific goal.

2. Organizing: It involves bringing together resources – the people capital and equipment – in the most effective way to accomplish the goals. It therefore, involves an integration of resources. And also it is establishing the internal organizational structures of the organization. The focus is on division, coordination and control of tasks and the flow of information within the organization. It is in this function that managers distribute authority to holders.

3. Motivating: Motivating plays a large part in determining the level of performance of employees, which in turn influences how effectively the

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organizational goals will be met. It involves directing along with communicating and leading. Leading or influencing requires three general skills/competencies.

- ✓ Diagnosing : it is cognitive
- ✓ Adapting : it is a behavioural competency and
- ✓ Communicating : it is a process competency

4. It involves feedback of results and follow up to compare accomplishment with plans and to make appropriate adjustment with plans and to make appropriate adjustments where outcomes have deviated from expectations.

5. Controlling: Controlling is the function that evaluates quality in all areas and detects potential or actual deviations from the organization plan. This ensures high quality performance and satisfactory results while maintaining an orderly and problem free environment controlling includes information management measurement of performance and institutions of correcting actions.

15.6 Principles of management

Fayol's fourteen principles of management are as follows

1. Division of work: the staffs of any organization function better way when assigned tasks according to their specialties. Work specialization results improving efficiency of operation. The concept of division of work can be applied to both managerial and technical function.

2. Authority and responsibility: Authority is defined as the right to give orders and the power to exact obedience. Authority can be formal or personal. Normal authority is derived from once official position and personal authority is derived from factors like intelligence and experience. Authority and responsibility go hand in hand.

3. Discipline: it supports strict and clearly defined rules and regulations in the workplace. Discipline is vital for running on organization smoothly. It involves obedience to authority, adherence to rules, respect for superiors and dedication to ones job.

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4. Unity of command: Each employee should receive orders or instruction from superiors only. The employees should only receive command and report to one administrator or authority.

5. Unity of direction: Activity should be organized in such a way that they all come under plane and are supervised from one person

6. Subordination from the individual interest to the general interest: Individual interest should not take precedence over the goals of the organization.

7. Remuneration: The compensation paid to employees should be based on the ability of the firm to pay. Remuneration principle invoke that both staff and management salary should be fairly earned, justifiable.

8. Centralization: depending on the situation an organization should adopt be centralized are approach to make optimum use of its personal.

9. Scalar chain: The reference to the chain of authority that extends from the top to the bottom organization. The scalar chain defines communication path in an organization. Scalar chain principle mainly based on the line of authority with peer level communication.

10. Order: This refers to both material and social order in organization material order indicated that everything is kept in the right place to facilitate smooth coordination of work activities. Similarly, social order is that the right person is placed in the right job.

11. Equality: All employ should be treated fairly. A manager should treat all employ in the same manner without prejudice. The relationship should still be in compliance with the principle of subordination of individual interest to general.

12. Stability of tenure personnel: A high labour turn over should be prevented and managers should motivate they are employees to do better job.

13. Initiative: The initiative principle refers to the management and their creativity and their ability to implement them within the organization to ensure growth and success in the organization. Employee should be encouraged to give suggestion and develop new work and better to practices.

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14. Esprit de corps: this means a management must a team spirit in its employees.

15.7 Meaning and concept of extension administration

Administration derived from Latin roots Ad + Ministaire which refer to management of affairs or looking after the people. Administration refers to management functions of planning & control.

Administration is various kinds like Public administration, Private administration, Extension administration, personnel administration etc

The Management of public affairs of a government or institution is called administration. In extension education knowledge of administration is very important which can be developed by administrators.

This knowledge will make the administrators aware of some of the unanticipated consequences of their decision. The higher level administration makes the others administrator to fully capable in skill, knowledge for solving problems of organization.

Administration can be defined as the guidance leadership and control of the efforts of a group of individuals towards some common goal. According to this definition the essence of administration is the ability of administrator to plan large projects held together and organization for its accomplishment.

Keep the organization functioning smoothly and efficiently and achieve the agreed upon objecting well within the allotment of the personal, time and resources available and without doing all the work himself.

Extension administration is the process through which agriculture and allied departments can implement development projects and programmes by performing managerial functions of planning, organising, leading and controlling.

Administration gives emphasis on policy making, obtaining finance, production & distribution. Whereas management mainly deals with actual execution of policies within limits set by administration.

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15.7.1 Nature of administration

It is universal: Concept of administration is used in every department, establishment, section to smooth management and used by whole world

It is holistic: it emphasis on various managerial, technical, policy making aspects as well as overall development of the organization.

It is goal oriented: The functions and activities of administrator lead to the achievement of organisational objectives and goal.

Social and human nature: administration utilizes all the resources and particularly human resource. Human resource management is one of the key dimensions of administration

It is dynamic: Administration has to make changes in goal, objectives and other activities according to changes taking place in the environment

It is continuous and ongoing process

Components of Administration

1. The establishment of predetermined objectives

2. The directing and control of resources

3. The measurement of the achievement of the objectives.

4. The goals of any organization are achieved through the setting out of objectives, which later becomes the policy of the organization.

5. The objectives are the guide poles of the work to be done. The administrator therefore must first of all understand all the ramifications of the objectives if he must achieve success.

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15.7.2 Difference between management and administration

Table 15.1 Difference between management and administration

Criteria	Management	Administration
Meaning	It is the skill of organizing people, resources and getting work done	It is the process of setting up objectives and crucial policies
Nature	Doing function – who should do and how	Thinking function – what is to be done where and why
Authority	Both middle and lower level	Strictly upper level
Core function	Policy implementation	Policy formulation
Role	Executive	Decisive
Area of Operation	Work under administration	Fully control over activities
Key Person	Manager	Administrator
Function	Governing and executive	Legislative and determinative
Main Focus	Managing work	Making policies and assembling resources
Application	Generally Profit-making organizations	Government offices, business enterprises, military, hospitals, educational organizations etc.
Decides on	Who will do the work? And How will it be done?	What should be done? And when should it be done?

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15.8 Functions of administration

An administrator generally divides the process of planning and implementation at different level from higher to lower level of management. He assigns tasks and responsibilities to the professionals operating at various levels.

Administrators, broadly speaking, engage in a common set of functions to meet the organizations goals. These 'functions' of the administrator were described by 'Henri Fayol'as the '5 elements of administration'.

1. Planning: Planning is deciding in advances what to do, how to do it, when to do it and who should do it. It maps the path from where the organization is to, where it wants to be. The planning function involves establishing goals and arranging them in logical order. Administration engages in both short-range and long range planning.

2. Organizing: organizing involves identifying responsibilities to be performed, grouping responsibilities into departments or division and specifying organizational relationships. The purpose is to achieve coordinated efforts among all the elements in the organization. Organization must take into account delegation of authority and responsibility and span of control within supervisory units.

3. Staffing: staffing means filling job positions with the right at the right time. It involves determining staffing needs, writing job descriptions, recruiting and screening people to fill positions.

4. Directing: Directing is the leading people in a manner that achieves the goals of the organization. This involves proper allocation of resources and providing an effective support. Directing requires exceptional interpersonal skills and the ability to motivate people. One of the crucial issues in directing is to find the correct balance between emphasis on staff needs and emphasis on economic production.

5. Controlling: Controlling is the function that evaluates quality in all areas and detects potential or actual deviations from the organization plan. This ensures high quality performance and satisfactory results while maintaining an orderly and

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problem free environment controlling includes information management measurement of performance and institutions of correcting actions.

6. Budgeting: Exempted from the list above, incorporates most of the administrative functions, beginning with the implementation of a budget plan through the application of budget controls.

15.9 Basic principles of administration

It is assumed that increased effectiveness of administration will occur when the principles of administration are followed. These principles are also called guidelines as they guide the administration in the performance of their job.

1. Principle of Hierarchy

a. The members of the organizations are arranged in a definite subordinate – super ordinate hierarchy of line positions, for example various class and group of employee.

It is also known as the 'Scalar process', where in lines of positional authority and responsibility run upward and downward through several levels with a broad base at the bottom and a single head at the top in order to preserve the 'unity of command'

b. In the effective organization each worker knows who his supervisor is and each supervisor knows whom he is expected to supervise. If a worker is subject to orders from several supervisors (as in case of village development officer), he gets confused, in efficient and irresponsible. In this arrangement the authority of making vital decision is entrusted with a specialized person located at the helm of the organization.

2. Principles of Authority

Effective administration occurs when authority allocated to and individual or group of individuals is sufficient. The authority and the responsibility should be clearly defined and understand by all persons in the organizations.

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3. Principles of responsibility with matching authority

The individual should not be burdened only with responsibilities but should also be provided with matching authority. This is more important in a decentralized form of administration. Responsibility without authority is just lie leaving an individual to fight with a tiger without a gun or weapon.

4. Principles of span of control

Span of control is the number of subordinates one has he supervise. In general, the span of control is such as to permit to decision making as it needed. It helps in attaining quality decision. It results in increased effectiveness and efficiency in attaining the organizational objectives. Some of the factors influencing the span of control include

a. the intensity and frequency of the need to see the chief,

b. the age of the agency

c. the magnitude of their problems

d. the professional competence and length of service of the staff

e. the size of the agency

f. the size of the geographic area in which the supervisor must operate

g. the importance of the decisions which the supervisor must make

h. the degree of control that must be exercised

i. the degree of repetitiveness of the work to be done.

5. Principles of communication

There should be two-way channel of communication, both vertical and horizontal in the organization. Communication ensures common understanding of organization values and objectives clear and proper assignments of authority and functions are required for success in large operations. Employees want to know what is going on without a broad sharing of information and purpose their morale will be low and the agency's task will be more difficult.

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6. Principles of organizational structure

The organization can no longer remain fixed or static changes in basic objectives, in size of staff, in professional competency, adjustments in programme emphasis, in the nature of institutional relationship within which the organization must operate will have to be made.

Similarly, the need for long range as well as short range planning of programmer personnel and finances may require many adjustments, in the form of the administrative organizational structures. In short the organizational structure should be subject to continue adaptations as conditions warrant.

15.9.1 Good Quality of Administrators

1. Initiative, Imaginative, Creative, Intelligent, Honest, Resourceful.

2. Drive

3. Translation of idealistic goals to tangible results

4. Persistence

5. Efficiency

6. Readjustment to new demand

7. Accommodating

8. Conversion of resources into goals and services.

15.10 Levels of Management

There are mainly three levels of management. The levels of management and their Functions are discussed below:

1. Top Level Management

Top level management is also referred to as the administrative level. They coordinate services and are keen on planning. The top-level management is made up of the Board of Directors, the Chief Executive Officer (CEO), the President and the Vice President etc.

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The top level management controls the management of goals and policies and the ultimate source of authority of the organization. They apply control and coordination of all the activities of the organization, department which would include their budget, techniques, and agendas.

There are several functions performed by the top-level management like

- ✓ To lay down the policies and objective of the organization
- ✓ Strategizing the plans of the organisation and aligning competent managers to the departments or middle level to carry them out.

2. Middle Level of Management

Middle level management is also referred to as the executive level; they are subordinates of the top level management and are responsible for the organization and direction of the low-level management. They account for the top-level management for the activities of their departments.

The middle-level managers are semi executives and are made up of the departmental managers and branch managers. They could be divided into senior and junior middle level management. The middle-level managers are in charge of the employment and training of the lower levels.

They are also the communicators between the top level and the lower level as they transfer information, reports, and other data of the enterprise to the top-level.

3. Lower Level of Management

The lower level of Management is also referred to as the supervisory or the operative level of managers. They oversee and direct the operative employees. They spend most of their time addressing the functions of the department, sections, as instructed by the managers above them.

The lower level managers are the first line of managers as they feature at the base of operations, so they are essential personnel that communicate the fundamental problems of the firm to the higher levels.

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They are the intermediary; they solve issues amidst the workers and are responsible for the maintenance of appropriate relationships within the organization. They are also responsible for training, supervising, and directing the operative employees.

The lower level managers represent the management to the operative workers as they ensure discipline and efficiency in the organization. They also organize the essential machines, tools, and other materials required by the employees to get their job done.

15.11 Basic Element in Extension Management

Extension plays vital links for rural development. India being developing country extension management act as facilitating tools to accomplish the desire objective. Some of the elements that are important in Extension Management (Benor and Baxter - 1981; Bhatnagar and Desai - 1987) need to be understood by everyone and these are:

Professionalism: Any extension organisation must have technically qualified staff to understand the problems of the farmers and guide them properly in adopting the agricultural technologies. Hence, their professional competence needs to be enhanced through in service training.

Every care has to be taken to select people of desired professional background depending upon the job requirements. They have to also understand the needs, aspirations, and attitude of farmers towards technology in order to plan appropriate educational programmes/activities.

Organisational Structure: An extension organisation must have a sound orgaaisational structure. The single line of command is always helpful than the dual control especially at the operational level. The single line of command is give greater emphasis in T&V System in India. Defective organisational structure leads to many organizational problems, making the agency ineffective.

Concentration of Efforts: The grass roots level extension workers would be more effective if they concentrate their work on any one area like, agriculture, horticulture, animal husbandry, fisheries etc. Otherwise, he or she may not be able

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to comprehend all the technical problems related to these subject matter areas and provide solutions to farmers.

Specificity: Any extension organisation should identify its target group, the nature of extension activity and the agricultural technology as such in specific terms. The extension worker should identify specifically his target group, extension activities and the technology and work to achieve the expected results.

Development of Professional Competence: The development of competence of the extension professionals through human resource development is essential in the context of fast changing technologies around the world. The need for updating the technical knowledge and skills of the extension professionals is vital.

The farmers today are more intelligent and knowledgeable because of their constant exposure to the mass media; social media etc. hence to maintain credibility need more capacity building efforts.

Linkages and Coordination: An extension system should have effective linkages with the research system and client system, to obtain latest knowledge from research stations and to effectively communicate the same to the farmers for large scale adoption. The extension system should carry the problems 'of the farmers to the research stations and solutions from research stations to the farmers.

Coordination with Other Support Systems: The extension organisation must have coordination with input agencies and credit institutions to help to meet the requirements of farmers. Coordination among all these system is equally important to achieve the required results.

Personnel Management Policies: There is a need for effective and efficient management of the personnel in extension organizations as they have deal with all kinds of people and take risks in involved in rural development

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15.12 Characteristics of Extension Management

The management properties of Extension include:

i. The Policies of the extension organisation should facilitate the organisation in recruiting, retaining and utilising the services of individuals having initiative, drive, integrity and honesty.
ii. Pre-service and in-service training programmes for the staff in order to develop their, technical competence. ,
iii. The extension system should establish strong linkages with research systems to help scientists understand the farmers' needs and problems and finalise research priorities.
iv. The organisational climate to be conducive for the extension functionaries to perform better.
v. A suitable model for the service and support function to cater to the needs of extension organisation in terms of quantity, quality and time of supply.
vi. Delegation of authority down to the field level to take decisions on matters which deserve immediate action.
vii. A good organisatioal communication to facilitate fee flow of information, ideas, thought in upward, downward and horizontal etc
viii. The extension organisation, not only have a plan of action, but also to have a system of monitoring and evaluation support for taking corrective steps in an on-going action programme.
ix. Appropriate organisational design for large scale participation of people, both in planning and execution of agricultural and rural development programmes

15.13 Meaning and Concepts of Organisation

Organization is the process of establishing relationships and coordinating the human as well as other resources to achieve the goal effectively and efficiently.

Organization is the ways of combines the work in such a way with individuals/groups that duties formed provide best possible application of available effort

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Louis Allen defines, “Organization is the process of identifying and grouping work to be performed, defining and delegating responsibility and authority and establishing relationships for the purpose of enabling people to work most effectively together in accomplishing objectives.”

Koontz and O’Donnell define the organization as the establishment of authority relationships with provision for co-ordination between them, both vertically and horizontally in the enterprise structure.

According to George Terry, “Organizing is the establishing of effective authority relationships among selected work, persons, and work places in order for the group to work together efficiently”.

There are two concepts of organization viz; static concept and dynamic concept

1. Static Concept: Under static concept the term ‘organization’ is used as a structure, an entity or a network of specified relationship.

2. Dynamic Concept: Under dynamic concept, the term ‘organization’ is used as a process of an on-going activity. In this sense, organization is a process of organizing work, people and the systems. Dynamic concept lays emphasis on individuals and considers organization as a continuous process.

15.13.1 Characteristics of Organization

Organization is the establishment of authority relationship among persons so that it helps in the achievement of organizational objectives. Some of the characteristics of organization are studied as follows:

1. Division of Work: Organization deals with the whole task of business. The total work of the enterprise is divided into activities and functions. Various activities are assigned to different persons for their efficient accomplishment. This brings in division of labour.

It is not that one person cannot carry out many functions but specialization in different activities is necessary to improve one’s efficiency. Organization helps

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in dividing the work into related activities so that they are assigned to different individuals.

2. Co-Ordination: Co-ordination of various activities is as essential as their division. It helps in integrating and harmonizing various activities. Co-ordination also avoids duplications and delays.

In fact, various functions in an organization depend upon one another and the performance of one influences the other. Unless all of them are properly coordinated, the performance of all segments is adversely affected.

3. Common Objectives: All organizational structure is a means towards the achievement of enterprise goals. The goals of various segments lead to the achievement of major business goals. The organizational structure should build around common and clear cut objectives. This will help in their proper accomplishment.

4. Co-operative Relationship: An organization creates co-operative relationship among various members of the group. An organization cannot be constituted by one person. It requires at least two or more persons.

Organization is a system which helps in creating meaningful relationship among persons. The relationship should be both vertical and horizontal among members of various departments. The structure should be designed that it motivates people to perform their part of work together.

5. Well-Defined Authority-Responsibility Relationships: An organization consists of various positions arranged in a hierarchy with well defined authority and responsibility. There is always a central authority from which a chain of authority relationship stretches throughout the organization. The hierarchy of positions defines the lines of communication and pattern of relationships.

6. Organization as a Process: As a process, organization is an executive function. It becomes a managerial function involving the activities such as Determining activities necessary for the accomplishment of the business

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objectives, Division of work, (iii) Grouping of inter-related activities, Assigning duties to persons with requisite competence, (v) Delegating authority, and Co-ordinating the efforts of different persons and groups.

When we consider organization as a process, it becomes the function of every manager. Organizing is a continuous process and goes on throughout the life-time of an enterprise. Whenever there is a change in the circumstances or material change in situation, new type of activities spring up. So, there is a need for constant review and re-assignment of duties. Right persons have to be recruited and necessary training imparted to make them competent to handle the jobs.

7. Organization as a structure (or, framework of relationships): As a structure, organization is a network of internal authority and responsibility relationships. It is the framework of relationships of persons operating at various levels to accomplish common objectives.

An organization structure is a systematic combination of people, functions and physical facilities. It constitutes a formal structure with definite authority and clear responsibility. It has to be first designed for determining the channel of communication and flow of authority and responsibility.

15.13.2 Features of extension organisation

1. The organization should have a name in consistence with its objectives.

2. It should be approved and recognized by the government. .

3. It should have a definite goals and objectives for which the members would work to achieve.

4. The objectives should be achievable.

5. Extension organizations should have provision for Subject Mater Specialists in different fields.

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6. The members should perform their duties and responsibilities under close supervision by the authority in order to maintain unity and integrity of the organization.

7. There should have a provision for horizontal as well as vertical communication the organizational structure.

8. Span of control should permit administrators and supervisors to fulfill their roles adequately.

9. There should be such arrangement that the individuals in the organizations get supply of needed materials in time.

10. The organization should have clearly defined salary and promotion policies.

11. Workers at different hierarchical levels in the organization should get adequate counsel, advice and guidance from their administrators and supervisors.

12. There should have a provision for training for all officers and employees.

13. There should have a provision for flexibility of programs.

14. There should have a regular activities aimed at organizational goals as fixed official duties.

15. Operations should be governed by a consistent system of abstract rules that are applied to each and

15.14 Reference

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Course Name	Fundamentals of Extension Education
Lesson 16	Rural Leadership: Concept, Importance and Types
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
University Name	Kerala Agricultural University, Thrissur

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16.1Objectives of the Lesson

- To understand the meaning, concepts and elements of leadership
- To find out the basic functions and qualities of leader
- To explore the classification and characteristics of leadership and leader
- To understand the methods of selection and training of rural leader

16.2 Glossary

Leadership is the technique or process to promote, stimulate, guide or influence the members to action

Leader is a person of influencing the behaviour of the follower in a given situation

Democratic leadership is one in which the leader and the members of the group have more or less equal participation in planning and decision making processes towards common goals

Autocratic leadership is one wherein the leader exerts absolute power and determines by him all plans or policies of the group

Laissez–faire Leadership is one in which the leader keeps his role to a minimum and allows maximum freedom to members of the group to determine the policies

Opinion leadership is one in which the persons to whom the village people go for opinion and advice on certain issues.

Professional leader is one who has received specific specialized training in the field.

Lay leader may or may not have received special training, is not paid for his work and usually works part time

Functional leaders are recognised because of their specialized knowledge and function in the society

Sociometry is a scientific method for identification of leaders

Training is the process of change in the knowledge, skills and attitudes of the individual through capacity building

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16.3 Meaning and concepts of Leadership and Leader

Leadership act as stimulating mechanism for the extension work can be more effective and efficient

Leadership is the technique or process to promote, stimulate, guide or influence the members to action. Such activity has been called as leadership and the individuals have been referred to as to leaders.

Leadership refers to the process of influencing members towards common goal while the person influencing the members towards common goal is called leader.

Leadership is the process of directing the behavior of others towards the accomplishment of some common objectives.

Leadership is influencing people to get things done to a standard and quality above their norm and doing it willingly.

Leadership is a process by which a person influences others to accomplish an objective and directs the organization in a way that makes it more cohesive and coherent.

16.3. Definition of Leadership

“Leadership is the influencing people so that they will strive willingly towards the achievement of group goals” Koontz, H. and C. O’Donnell, (1978).

Leadership is the process whereby an individual directs, guides and influences the thoughts, feelings and behaviour of other human beings. Hariman.

Leadership is the process of influencing the behaviour of the individual in a given situation. Dahama and Bhatnagar

Leadership is essential in simply influencing attitudes and actions of one or more persons leading towards the achievement or so purpose. Niderfrank (1966)

"Leadership is an act that influences" says Tead (1926).

"Leadership is the ability to persuade others to seek defined objectives enthusiastically". Davis (1977)

Leaders are persons who are selected by the people because of their special interest or fitness to work on several phases of the local programmes. - J. S. Gang

A leader is one who, in a social situation, can elicit (stimulate) positive reaction from other members of the group. - B. M. Stogdill

Leader is a person who has been spontaneously considered or chosen as being influential. - Dahama & Bhatnagar

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16.3.2 Elements of leadership

Leadership is the process of influencing, guiding, motivating and directing his follower to achieve the goal in a specific context.

The basic elements of leadership are:

a) leader – who leads the mechanism or activity

b) The followers – who allow themselves to be influenced by the leader.

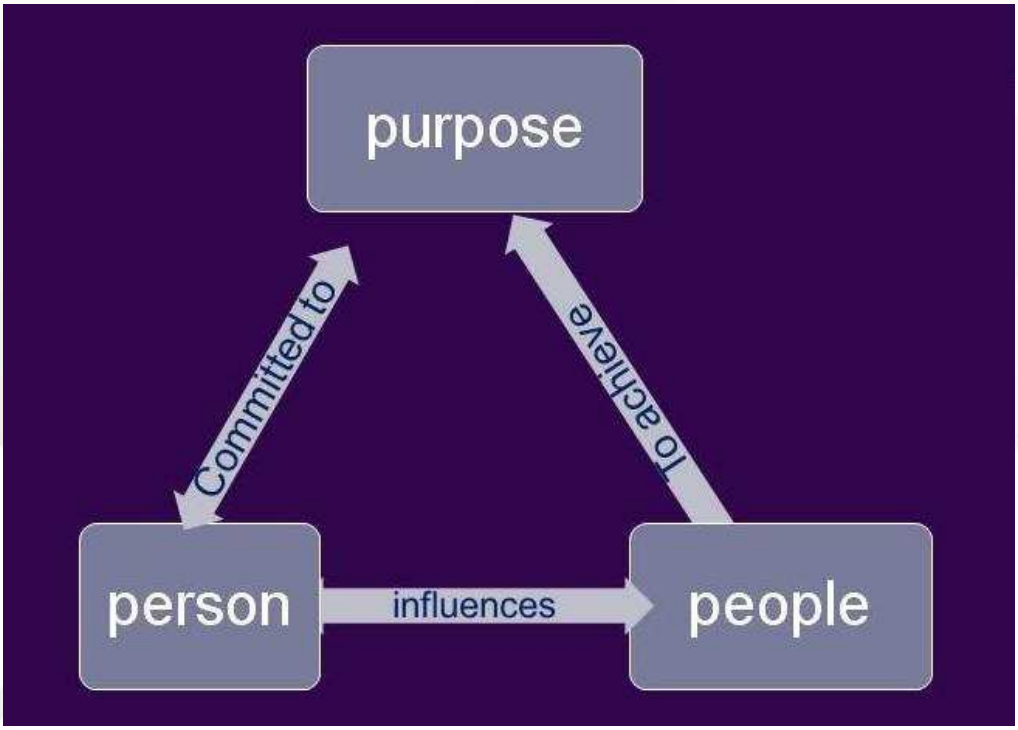
c) The situation – the cultural context and social context

d) The task – the common goal set by the group for achievement.

16.3.3 Three P element of leadership

Leadership could be conceptualizes considering 3 P viz; Person(leader), People(the follower) and Purpose(the goal).

Fig 16.1: element of leadership



16.4 Functions and roles of leadership

16.4.1 Functions of Leaders

Leader is act as change agent who plays the function of management viz; leading organizing, guiding, and managing others. The functions of leadership are every from situation. Generally speaking, leadership functions are related to goal achievement and to the maintenance and strengthening of the group.

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The primary tasks of a leader are to set direction which includes mission, goals, vision. A leader builds commitment, motivate & inspire to achieve. Leadership role confront challenges considering the innovation, deal with change, turbulence, take risks.

According to Barnard, a leader performs four main functions.

They are determination of objective, manipulation of means, control of the instrumentality of action; and stimulation of coordination action.

Following are the development functions of leaders:

1. Serve as first- foot-hold: Rural leaders are helpful to development agents for their first contact in the village.

2. Serve as introducers: Rural leaders help in introducing the development agents to the people of a community.

3. Serve as informants: Rural leaders help development agents in collecting vital statistics about the community.

4. Serve as effective planners: When leaders are involved in planning development programmes, the programmes get the quality of being that of the people and carry an implicit assurance of people's participation. Their knowledge about the local problems helps in formulating effective development programmes.

5. Serve as effective executors: The leaders can be entrusted a part of the programme for execution as they enjoy more popularity and confidence of people in the community. This makes the leaders to take more interest in influencing people to accept and adopt the programmes.

6. Serve as legitimizers: Social or moral support of the leaders to the development programmes enables larger adoption of them by the people. This is because of the intimate relationship between the leaders and people.

7. Serve as multipliers: Leaders help development agents in spreading development message or programme to all the people in community. This is mainly due to their close personal contact with people.

8. Serve as mass mobilizers: The rural development could be achieved to a higher level only when people participate in the development programmes. This could be achieved only when the leaders are involved in development process.

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9. Serve as resource mobilizers: Leaders are very much useful to mobilize the resources (material, manpower, money) locally required for executing development programmes.

10. Serve as beneficiary identifiers: Recent rural development programmes are beneficiary oriented. Hence, there is need for identifying deserving beneficiaries and in this process the leaders are highly useful as they have better knowledge about living conditions of people.

According to Dahama and Bhatnagar (1985) following are the functions:

a) Executive
b) Planner
c) Policy maker
d) Expert in human relations as well as technical field.
e) External group representative
f) Controller of internal relationship
g) Purveyor of reward and punishment
h) Arbitrator
i) Exemplar
j) Group symbol
k) Surrogate of individual responsibility
l) Idealist
m) Father figure and
n) Scape goat.

16.4.2 Role of Leaders

Leader plays various roles to achieve the goals. Reddy (1987) brought out the following eight important roles.

1. Group Spokesman: Leader has the responsibility to speak for the group and representing the group's interests and position faithfully and accurately.

2. Group Harmonizer: All groups will usually have both uniformities and differences of opinion. The leader is responsible for pointing out to the group when potential conflict situations arise, that the common purpose is sufficiently worthy of co-operation that the differences be resolved peacefully.

3. Group Planner: Generally, persons are chosen for leadership positions because it is assumed that they know a little more about the problems confronting the

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group and their possible solutions than do the other members of the group. The group expects its leader to have new ideas for initiating activities. To meet this expectation leader must be able to plan, and visualize in his imagination, the ways by which the group can satisfy its needs.

4. Group Executive: Most groups have established some methods of conducting business and achieving consensus of opinion on issues that come up before them. The leader is one who presides when the group is conducting business. As a group executive the leader is responsible for seeing that the business of the organisation is carried on according to democratic principles.

5. Group Educator or Teacher: Leader must share with the followers' his knowledge and experience. Such sharing of experience and insight is teaching. Good leadership depends on a large part upon because the good teacher is not a dictator.

6. Symbol of Group: Ideals All social groups have implicit or explicit norms or ideas. As a rule, persons accepted as leaders are those who have accepted these norms and live by them. The group expects his leadership to embody the ideals of group.

7. Group Discussion Chairman: This role is more related to that of group executive. In recent years there has been an increased interest in group discussions. Generally, a group meets for a panel discussion or a forum or a group thinking conference as something apart from the routine business of the organization.

8. Group Supervisor: The leader has to work with followers and also with group organizations like youth clubs, co-operatives, farmer's associations, etc. Therefore, this role becomes important for the leader.

Dahama and Bhatnagar (1985) ascertained the **role expectations of farm leaders** in view of the new strategy of agricultural production from the experts in the field of agricultural extension. By working out the index, following were identified as the expected role of farm leaders.

1. Raising demonstration plots and showing it to others.
2. Keeping themselves abreast with the latest agricultural technology.
3. Adopting themselves all the improved agricultural practices.
4. Organizing meetings and other discussion groups.
5. Serving as marketing advisers.

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6. Supplying the improved seeds to the farmers.
7. Assisting the farmers in getting credits.
8. Serving the innovative farmers in the village.
9. Educating the farmers to grow more than two crops a year.
10. Acting as liaison officers between the extension workers and the farmers.
11. Educating the farmers in the latest agricultural technology.
12. Helping the fellow-farmers in getting the needed agricultural inputs.

Singh and Saraswat (1968) as quoted by Singh (1987) studied the important roles of leaders in promoting the rural development efforts. They are:

1. They co-ordinate the efforts of the group to achieve its goals.
2. It is the responsibility of group leaders, to establish proper social climate in the group.
3. Leaders assist the groups to organize themselves.
4. They promote the message of the extension agencies.
5. They help extension workers in planning and executing various development programmes.
6. They act as demonstrators for the innovations.
7. It is their job to create better inter-group and intra-group coordination.
8. They also act as spokesman for their respective groups.
9. Local leaders help the group to make the effective decisions and develop scientific decision-making process.
10. They encourage the members to learn from each other's experiences.
11. They develop self confidence in the followers to solve their own problems.
12. They act as model for other members.
13. They help in establishing favourable climate for various developmental agencies to start their work.
14. They support and motivate the followers to make self efforts for realizing their needs.
15. They take an active part in organizing and the functioning of various institutions.

16.5 Qualities of a Good Leader

A good leader should act as motivator, guide, facilitator, influencer, problem solver etc. The following qualities need to be possess to become a good leader:

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Commendable: A leader should be commendable and exemplary. A good leader should be trustworthy so that people can follow him. He should live his life with honesty and integrity. He should live a life such that nobody can question his character.

Enthusiastic: A good leader is always enthusiastic about the cause of the people. He must have the capability to see what is good or bad for the people in the long run. He approaches a problem in a holistic manner and never believes himself different from his people and subject.

Discipline: A leader believes in discipline. He follows an orderly manner and routine but still he is tolerant. He takes decision keeping emotions and personal matters aside.

Logical and analytical: A leader has excellent logical and analytical skills. He looks each and every aspect of the situation before arriving to any decision and never loses his temper in difficult situations. He should think positively in each and every situation.

Goal achiever: A leader should always focus towards his goals, what he has envisioned for and promised to his people. He should take each and every decision keeping in mind the people and his subject.

Proactive: A great leader is proactive and committed to excellence. He always maintains high standard and acts as an idol for his followers. His personal and public life both are remarkable and stain-free.

Crisis manger: A leader inspires his team to achieve target and lead them to success. He brings best out of them in the time of crisis also.

A good leader is the one who can give people voice and direction.

Persistence: A leader should be tolerant of uncertainty and should always remain tranquil, composed and persistent to his goals.

Dahama and Bhatnagar (1985) brought out the determinants of effectiveness in leadership functions (ten 'A's).

1. Awareness of the functions of the group.
2. Ability (self-adjustment) in performing the functions
3. Achievement of goals
4. Assignment of group functions to members
5. Appraisal of effects of distribution of functions

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6. Accomplishment of different purposes under different environments
7. Attainment of positive value as a leader
8. Attaching a high code of conduct, ethical values and high morale in the group
9. Arrangement of communication structures
10. Acceptance of failure

There are significant and important factors for effectiveness of leaders have also identified by various research finding. The factors identified are given below:

1. Need fulfillment
2. Prestige
3. Valued membership
4. Co-operative relationship
5. Heightened interaction
6. Clarity of goal
7. Small units
8. Homogeneity
9. Outside events
10. Increased position
11. Attack from environment

Reddy (1987) tested the following traits or qualities as desirable for effective leadership.

1. Physical fitness
2. Mental ability (intelligence)
3. Sense of purpose (having definite ideas regarding the aims of the group)
4. Social insight (sensitivity to other person's position problems or points of view)
5. Communication (including good listening and speaking acceptably in public)
6. Love for people (friendliness without favoritism or without giving scope for indiscipline)
7. Democracy (giving all members equal opportunities for participation, etc.)
8. Initiative
9. Enthusiasm
10. Authority (based upon mastery of knowledge and skills in a particular field)
11. Decisiveness (ability to make good and prompt decisions or judgments)
12. Integrity or character

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13. Teaching ability
14. Convictions and faith

16.6 Classification of Leadership and Leaders

16.6.1 Classification of Leadership and their characteristics

Generally, leadership is classified into three types as follows based on nature of functioning of the leaders in groups/societies.

1. Democratic leadership.
2. Autocratic leadership
3. Laissez-faire leadership

1. Democratic leadership is one in which the leader and the members of the group have more or less equal participation in planning and decision making processes towards common goals.

There is ample scope in this type of leadership for mutual discussions and suggestions between leader and members. Thus, there is no question of either the leader or the members of the group depending wholly on each other. This type of leadership could be seen in groups or societies where democratic system of governance prevails.

2. Autocratic leadership is one wherein the leader exerts absolute power and determines by him all plans or policies of the group. The leader never consults any member nor allows any freedom to give suggestions on any of his plans/policies or decisions. He expects that his judgment should be obeyed without any questioning.

He brushes aside all doubts and doubters. Thus, there is more dependency and less of individuality on the part of the members of a group. This kind of leadership existed in Germany during Nazi period when Hitler was the leader.

3. Laissez–faire Leadership is one in which the leader keeps his role to a minimum and allows maximum freedom to members of the group to determine the policies and plans essential for achieving the goals. Thus, there is less dependency and more individuality on the part of the members of the group.

16.6.2 Leadership in Indian Villages:

The leadership in Indian villages is classified as follows:

1. Administrative leadership is one wherein the leaders are appointed by the Government to take care of village administration and development. Examples are

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extension agents and village officers like village accountant, agricultu ral assistant, health extension agents, etc.

2. Institutional leadership is one wherein the leaders are elected by the village people to village organizations like panchayat, co-operatives etc. The leaders hold office in these organizations only for some specific period of time. Examples of these leaders are chairman of a panchayat, president and other office bearers of youth club, farmers'association, mahila mandal, etc.

3. Opinion leadership is one in which the persons to whom the village people go for opinion and advice on certain issues. The opinion leaders also act as legitimizers and influence decision making of the opinion seekers.

4. Functional leadership is one in which the leaders are recognized because of their specialized knowledge and function in the society. Examples are headmaster of a school, doctor, scientist, agricultural innovators, etc.

16.6.2.1 Types of leaders in rural area

1. Professional leaders: the professional leader is one who has received specific specialized training in the field. He works full time as an occupation and is paid for his work. E.g. Extension Officer, Gram Sevak, Agricultural Officer etc.

2. Lay leaders: the lay leader may or may not have received special training, is not paid for his work and usually works part time e.g. youth club president, Gram Sahayak etc. Lay leaders also called as Volunteer leaders, or local leaders or natural leaders.

These local leaders may be either formal leaders or informal leaders, depending on whether they are regular office bearers of organized groups or not Professional leaders are otherwise called as formal leaders

3. Traditional leaders: They emerge out of tradition and stick to tradition. They are Static type and do not accept change. They have vested interests. e. g. Tribal chiefs

4. Caste leaders: the followers belong to the same caste as that of leaders. They Provide leadership in matters related to caste.

5. Religious leaders: Become leader by preaching religious doctrines or performing religious acts or rituals. Advise followers on religious matters. e.g Temple priest

6. Political leaders: Arise out of the political system. For example, the ward member, sarpanch of the village panchayat

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7. Functional leaders: Recognised because of their specialized knowledge and function in the society. E.g. Professionals like teachers, doctors etc.

8. Opinion leaders: These are the people to whom other people go for opinion or advice on certain issues. Also act as legtimisers and influence decision making of the followers.

In comparison to opinion seekers, opinion leaders have more social participation, extension agency contact and exposure to mass media. Opinion leaders are more cosmopolite and more innovative. They amplify the dissemination.

16.6.3 Classification of Leaders

Different authors classified the leaders in different ways. Some of the classifications are:

1) Lester (1975) also pointed three types as:

a) Autocratic

b) Democratic and

c) Free rein

2) Haiman (1951) described five categories as the

a) Executive

b) Judge

c) Advocate

d) Expert and

e) Discussion leader

6) Carter (1961) identified three leadership patterns according to the manner in which the leader was mostly oriented such as

a) Personal

b) Institutional and

c) Flexible

7) Sachdeva and Vidyabhushan (1974) studied three main leadership types as;

a) Authoritarian

b) Democratic and

c) Laissez-faire

8) Dahama and Bhatnagar (1985) found several ways of classifying leaders, some of them are;

a) Democratic, autocratic and laissez-faire

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b) Formal and informal leaders
c) Professional and lay (voluntary) leaders
d) Political, religious, social and academic
e) Elected, selected or nominated
f) Popular and unpopular
g) Traditional and progressive leaders

Jhirli (2019) identified three leadership patterns according to concern for production and people

a) Laissez-faire (L) Leader
b) Autocratic (X) Leader
c) Benevolent (Y) Leader
d) Team (Z) Leader

16.6.4 Classification of Leader and their characteristics

The characteristics of leaders differ according to leadership styles or pattern. The three major styles of leadership are authoritarian or autocratic, participative or democratic and delegative or Free Reign. The characteristics of three types of leaders are as detailed:

1) Autocratic

Autocratic leader is also known as authoritarian leader. He operates as if he cannot trust people. He thinks his subordinates are never doing what they should do; that the employee is paid to work and therefore must work

a) Determines all policies, activities and goals of the organization.
b) Takes no part in work except when conducting meeting, telling others what to do or demonstrating.
c) Members are uncertain about what to do and usually take actions they are told to take.
d) Leader is personal in both praise and criticism of the work.

2) Democratic

Democratic leader shares with the group members the decision making and planning of activities. The participation of all members is encouraged. He works to develop a feeling of responsibility on the part of every member of the group

a) Produces a shared leadership that permits a feeling of satisfaction and achievement.

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b) Helps the members of understand the steps required in working.

c) Members take more responsibility for group maintenance and task performance.

3) Laissez faire

He believes that if you leave workers alone, the work will be done. He seems to have no confidence in himself. If at all possible he puts off decision-making. He tends to withdraw from the work group. He is often a rationalizer.

a) Gives minimum guidance

b) Remains in the background and seldom express an opinion or works with a minimum of roles. c) Members often act as leaders in making decisions that guide the organization.

Role of Democratic leadership in extension

In extension education, the extension worker will be dealing mainly with democratic leadership. Therefore, it will be worthwhile to know their advantages and limitations.

Advantages

- ✓ People fully understand those ideas which they have helped to formulate.
- ✓ Decision made by the group members will get more support from the members.
- ✓ Democratic leadership enables the society to grow upon all of' the human resources that are available to it.
- ✓ Democratic leadership creates strong, responsible and self-reliant individuals.
- ✓ It builds a group which will not fall apart if something happens to the leaders.
- ✓ Democratic leadership makes for higher morale in a society than does the autocratic leadership.
- ✓ Those who disagree with group decisions are free to express their discontent, even though they may have to abide by the group decisions.
- ✓ It is always opened to the possibility of change.
- ✓ The method of making social decisions is important as the decisions themselves.

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Limitations

- ✓ The vocal and powerful members become dominant, thus creating sense of inequality in the group. Policies are agreed upon verbally in groups which do not automatically provide an answer to every specific question which arises.
- ✓ Problem of individual who refuses to confirm to group decisions.
- ✓ Decision making is a time consuming process. The officials have to face the tyranny of indecisions. Participation of large number of people becomes a problem, because the physical limit to the number of people who can work together conveniently at one time.

16.7 Rural Leaders in Extension Service

1. Leaders speak in the language of the local people and therefore often are understood by the people.
2. Leaders can help to analyse local problems which is a basis for programme development.
3. Prestige and personal following of the leaders increase the likelihood of new practices being adopted.
4. They amplify the dissemination of innovations in a social system
5. They help the participation of local community in extension programmes.
6. They act as linkages between the extension worker and the community.

16.8 Advantages and Limitations of leaders in extension

Reddy (1987) brought out the following advantages and limitations in using local leaders in extension.

16.8.1 Advantages of leaders in extension

i. Local leaders virtually play the role of extension teachers and hence the volume of coverage with improved practice is increased.

ii. Cost of extension is reduced, as local leaders are not paid for their work.

iii. Local leaders themselves become better taught, because of the experience they gain in teaching and influencing others.

iv. People accept a new idea more readily from a local person who has practically tried it, while they may resist if the ideas were to come from a paid extension worker.

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v. The frequent association of extension personnel with the local leaders enhances his prestige.

16.8.2 Limitations of leaders in extension

i. Persons selected as leader may not have the expected following among neighbours.

ii. Sometimes they may not be willing to devote required time to work or may be a poor teacher.

iii. Considerable time is required to locate and train local leaders.56

iv. Local leaders may try to use prestige with position for personal advantage.

v. Public recognition and publicity given to informal local leaders may sometimes jeopardise their position and adversely affect their influence among the people.

16.9 Methods of selection of professional and lay leaders

Principle of leadership emphasize the essentiality of leadership in the technology transfer, rural development, enhanced agricultural productivity etc. Leader can act as functional and change agent and hence selection of professional and lay leader is important.

16.9.1 Selection of Professional Leaders

A. Interview: The most widely used method of selecting persons for position of professional leadership. It is based primarily upon an interview and an evaluation of past academic and occupational records of the individual.

The chief difficulty with the interview is that one can observe and evaluate the applicant only as he answers questions during a brief period of time

Now days interview are combined with the group discussion which measure ability, aptitudes, attitudes and interests and both the academic training and practical experience

B. Performance Tests: These have been used in certain situations as a part of the basis for selection of professional leaders. One type of these is the 'Leaderless group tests' in which seven or eight persons are given a common task to perform and it is left up to the persons involved to determine which person have become the leader

Another type of test is to appoint an individual as a leader and then observe how well he directs the activities of the members of the group. The big advantage of

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these performance tests is that one can observe the potential leader in a real life situation in which he is functioning as the leader of a group

16.9.2 Selection of lay leaders

1. Sociometry: It is a scientific method for identification of leaders. Sociogram is a diagram consisting of circles representing persons in a group with lines indicating which people did not choose each other. This technique describes the Social relationship that exists between individuals in a group.

This is primarily concerned with obtaining choices on interpersonal relations such as with whom one would like to work, play etc. or to whom one would go for advice or for dealing other problems. It attempts to describe social phenomena in quantitative terms. It may be used in selecting both professional and lay leaders.

2. The workshop method: Through this method, the larger group is divided into smaller groups and the responsibility of the programme and decision making rests upon the smaller unit; leadership emerges in each group. Person can be selected as leader if he successfully takes the responsibility.

3. Key informants: In a community, key informants like Gaon sathi, youth club president etc may be asked to indicate leaders in that area. This is a cost-saving and time-saving method.

4. Self-designating technique: In this technique, a respondent is asked a series of questions to determine the degree to which he perceives himself as an opinion leader.

5. Election method: Leader may be selected through the election process among the village people. It is the method widely used in selecting leaders, consists simply of the members of the group electing a leader through voting or any other method

6. The Group Observer: The extension worker should observe a community or group in action and then he will be able to spot potential leaders. He may observe the community in any type of situation. For obtaining the best results, the group should not be aware of that the extension worker is observing them

16.10 Training of professional and lay leader

Capacity building is key objective of human resource development. Training programmes are organised for to further develop the skills of leaders who were already considered as leaders and to promote leaders who have hidden leadership qualities.

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These trainings will help the leaders to improve this technical competence and also their confidence levels.

16.10.1 Meaning of training:

The term 'training' is used to those activities aimed at improving the ability of a person to do his job including acquainting information, developing abilities, attitudes that will result in greater professional competency. The potential leaders who are selected by various methods, lack some of the essential traits of leadership, the qualities can be developed by training objectives as follows:

16.10.2 Objectives of training of leaders:

1. To develop the essentials of good leadership in the selected leaders
2. To give them a perfect understanding of the people, to enable them to understand group behavior
3. Develop competence in group processes i.e. teaching them the methods of identifying problems develop cooperative thinking, exchange and analysis of ideas
4. To acquire technical skills necessary to carry out a job, how to identify problems and plan appropriate procedures.
5. To obtain attitudes, knowledge and skills of dealing with people.
6. To develop in them latest capacities of leadership

16.10.3 Methods of training of professional leaders

1. Refresher courses organized by various institutions for leadership development. It emphasise the new creative skills needed for leadership
2. Background courses in college or an institution: Giving training on general college education in a college or an institution in psychology or sociology
3. Induction training: apprenticeship experience under the direction of a trained and experienced leader in the field will enable the new professional leader to develop his abilities for successful leadership
4. In-service training: This is training is given to the professional leaders for constantly improving their efficiency by focusing attention upon the problems they have faced in the field and the ways to solve them. In-service training has become increasingly important in view of the fast changing technology in agriculture in recent times

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16.10.4 Methods of training of Lay leaders

The different methods of training lay leaders are classified in to two types one is formal and the other is informal as given below

Informal Methods: It may be observation, where leaders are noticing how others have performed.

Reading the printed literature, circular letters, farm publications etc. from community development workers

Talking with other leaders or progressive farmers or others in the field of interest to effective utilization of experience

Formal methods of training of lay leaders:

1. Lecture: This is probably most common method. Through this method local leaders under training are given enough material for thought, but little opportunity for self-expression. The lecture method is effective in certain situations, but usually is supplemented by other methods, depending on the objectives to be attained

2. Discussion: Discussion usually occurs in a face to face or co-acting situation in which people involved, exchange the useful information by speaking with each other

3. Workshop: It is essentially a long-term meeting form one day to several weeks, involving all the delegates (participants) in which problems are discussed by delegates in small private groups. The workshop as the name indicates must produce something in the end a report, a publication, a visual or any other material object

4. Forum: it is assemble (group of people) for discussion of matters of interest and usually follows the other extension teaching methods. In the forum the audience clear their doubts and raise questions for additional information

5. Symposium: this is short series of lectures in which 3 or 4 speakers explain the different parts of a particular subject

6. Field trip: in this method a group people go to see and gain firsthand knowledge of improved practices in their natural setting

7. Training camps: Training is imparted by organizing camps in which several local leaders are involved in the training sessions at the same time

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8. Direct assistance from experts: this may come in the form of advice from an expert in the field of leadership

9. Buzz Session: in this a large group is divided into smaller units for a short period called buzz session. It is also called as huddle system or Phillips 66 in which group of 6 to 8 persons get together after receiving instructions to discuss about a specific issue assigned

10. Giving responsibility to local leaders: giving everyone a job by which self-confidence may be attained by achievement in activities useful to the group is essential for development of leadership

11. Use of Audio-visuals: These include role playing, socio-drama, demonstration, movies etc

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Course Name	Fundamentals of Extension Education
Lesson 17	ICT in Extension Education and ICT Use in Rural India
Course Revisor	Sujit Majhi
University Name	Orissa University of Agricultural and Technology, Bhubaneswar
Course Reviewer	Binoo P Bonny
University Name	Kerala Agricultural University, Thrissur

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17.1Objectives of the Lesson

- To understand the meaning, concepts and features of ICT
- To find out the need of cyber extension and benefits of ICT in extension education
- To understand the various tools and application of ICT in extension education
- To explore ICT initiatives for agricultural development in India

17.2 Glossary

Information and communication technology (ICT) can be defined as an electronic means of capturing, processing, storing, and communicating information

Information Technology (IT) refers to computer based technology and telecommunications.

Cyber extension refers to the using of online networks, computer communications & digital interactive multi-media to facilitate dissemination of agricultural technology, innovation, practices.

E-Governance is the application of IT to governance in rendering administrative services

Multimedia communication is the representation, storage, retrieval and dissemination of machine processed information expressed in multimedia such as text, voice, image, audio and video

Internet is a network of networks connected through different types of communication channel to communicate irrespective of distance and time.

Fax is a device used for transmission of a written document, photograph, map or any other graphic, material electronically.

Agriculture portal are website that serves as a gateway or a main entry point ('cyber door') on the internet to a specific field-of-interest or an industry.

Information kiosks are the public installations wherein computers are installed to make agricultural extension services accessible to people

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Expert system defined as a system that uses human knowledge captured in a computer to solve problems that ordinarily require human expertise

17.3 Meaning and concepts of ICT and Cyber extension

Information and Communication Technology (ICT) are usually understood as technologies that facilitate communication and the processing and transmission of information by electronic means. It encompasses the full range of ICTs from radio and television to telephones (fixed and mobile), computers and the Internet.

Information and Communication Technology (ICT) have been key enablers of development, facilitating flows of information, ideas, people and products.

ICTs are basically information handling tools that is a varied set of goods, applications and services that are used to produce, process, store, distribute and exchange information. (UNDP, 2001)

ICT in agriculture is an emerging field focusing on the enhancement of agricultural and rural development in India. It involves application of innovative ways to use ICT in the rural sector.

Information and communication technology (ICT) can be defined as an electronic means of capturing, processing, storing, and communicating information (Duncombe & Heeks, 2005)

Concept of IT and ICT

There are mainly three components of ICT viz; computer technology, communication technology, and information management technology. These technologies are applied for processing, exchanging and managing data, information and knowledge.

Information is data that have been put into a meaningful and useful context and communicated to a recipient who uses it to make decisions.

Information Technology (IT) refers to computer based technology and telecommunications. These are electronic systems for receiving, processing, storing, retrieving and transmitting information.

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Information Communication Technology (ICT) is often used as an extended synonym for information technology (IT).

The term ICT is also used to refer to the convergence of audio-visual and telephone networks with computer networks through a various linking systems.

ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form.

According to Wikipedia (2008), the term ICT is the broader term of Information Technology (IT), to explicitly include the field of electronic communication, in addition to IT.

The term IT is defined as "the study, design, development, implementation, support or management of computer- based information systems, particularly software applications and computer hardware." IT deals with the use of electronic computers and computer software to convert, store, protect, process, transmit and retrieve information, securely.

ICT (Information Communications Technology) can be seen as an integration of IT with mediation broadcasting technologies, audio/ video processing and transmission and telephony. Therefore, ICT can be seen as an extended acronym for IT.

ICTs are those technologies that can be used to interlink information technology devices such as personal computers with communication technologies such as telephones and their telecommunication networks. The PC, laptop and tablet with e-mail and internet provides the best example (Mondal, 2019).

Cyber Extension/ E-Extension

E-Extension is also known as cyber extension. It is defined as the 'extension over cyber space' Thus, Cyber extension in agriculture refers to the using of online networks, computer communications & digital interactive multi-media to facilitate dissemination of agricultural technology, innovation, practices.

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Cyber: According to Oxford dictionary the word Cyber means "relating to Information technology, the Internet and virtual reality, the Cyber space. The word has its origin from cybernetics.

Cyber space: The cyber space is the imaginary or virtual space of computer connected with each other on networks, across the globe. These computers can access information in form of text, audio, graphics, video and animation files. Software tools on network provide facilities to interactively access the information from connected services. The cyber space thus can be defined as the imaginary space behind the interconnected telecommunications and computer networks, the virtual world.

Extension stands for "the action or process of enlarging or extending something". It could be extension of area, time or space.

E-extension and cyber extension are more or less synonymous and can be used interchangeably. Cyber extension and e-extension are extension approaches; whereas ICT is the tools by which various services are delivered to the clientele fulfilling the objectives of e-extension/ cyber extension (Mondal, 2019).

Cyber extension is that extension of agricultural information which takes place by means of digital technologies in an imaginary space of networked computers. Cyber extension tools refer to the media by which farmers can retrieve the information and get solutions to their queries. (Rathore and Kumar, 2021)

Cyber extension includes effective use of information and communication technology, national and international information networks, internet, expert system, multimedia learning systems and computer based training systems to improve information access to the farmers, extension workers, research scientists and extension managers.

17.3 Characteristics features of ICT

ICTs are emerging as an important tool for the development of societies and have driving forces in the field of education, extension and research. It encompasses unique features which are given below:

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Accessibility to the information: Access to the astounding store-house of information is free

Instant availability: The information is available instantaneously round the year and twenty-four hours a day. ICT have characteristic of transmitting certain information over a long distance and with extremely fast speed.

Interactive Communication: ICTs will provide an exchange of information between source, the user, and a computer

Innovation in the component and development: The creation of new means in the ICT to further enhance communications. ICTs have been developed under the protection of development and the need to innovate

Available from anywhere: The information is available from any point on the globe. If something has to stand out as a priority of ICT is the possibility of maintaining a continuous and direct contact with user.

Interconnection among technologies: ICT is a link between various technologies. The clearest example is the union of communication and computer technologies, which gave rise to email.

Digitization of the content: All the information we process is in a single universal format. The photos, texts, audio, etc. can be transmitted by any means.

Dynamics in nature: The communication is dynamic and ever growing.

Union of culture, science and technology: ICT is the union of beliefs, customs and all those habits that society has adopted as routine. ICT can bring changes in the whole community through the benefits that technology.

It is based on other scientific aspects: ICTs applied to education are enriched by other scientific aspects, such as the pedagogical sciences, through innovations in teaching-learning methodologies.

Power the intellectual abilities: ICTs develop the intellectual skills of targets of agricultural development, betting on a fun and dynamic training.

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Reduced storage space: ICT has the possibility that all storage is online, so the space occupied is immaterial. Therefore, it is easier to be moved from one place to another, since it should not be moved in any heavy way.

Any system applied for getting information and knowledge for making decisions in any industry should deliver accurate, complete, concise information in time or on time.

The information provided by the system must be in user-friendly form, easy to access, cost-effective and well protected from unauthorized accesses

These are the main characteristics that define well what ICTs are. Comfort, interactivity or connections are one of the hallmarks of Information and Communication Technologies.

17.4 Need and Objective of Cyber Extension

17.4.1 Need for Cyber Extension

Communication, connectivity, Creativity and comfort are the main characteristics that define significance of ICTs

- To increase and accelerate agricultural growth
- To expand knowledge resource of farming community
- To facilitate better information access to the various stakeholders involved
- To supplement inadequate technical manpower, thus it can bridge the gap
- For stronger research-extension-client system linkage
- To develop efficient feedback mechanism
- For cost effective extension delivery
- To develop knowledge managers
- To ensure gender equity in technology transfer process
- To empower small and marginal farmers
- To serve the farm stakeholders beyond technology transfer role

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17.4.2 Objectives of ICT for Agriculture development

The main objectives of ICT enabled agriculture are as follows:

- To ensure ownership and develop entrepreneurship in farmers of Indian villages.
- To spread knowledge of technologies, crop cycle, suitable use of fertilizers etc.
- To ensure language and cultural pertinence and active participation of farmers.
- To help the villagers augment the growth of agriculture and contribute in GDP growth.
- To implement a framework for agricultural development strategies, investments and programs. To increase public investment in agriculture.
- To develop local content and create awareness.
- To provide easy access to local as well as global markets.
- To improve access to financial and banking services.
- To use innovative practices through science and technology.
- To provide concrete guidance on agriculture through real time digital technlogies

17.5 ICT use in rural India

Cyber extension can provide large amount of information to farmers. Information provided through cyber extension which provides wide range of applications and benefits is as follows:

1. Dissemination of Information on innovative technologies: the information on new technologies can be transfer to the farmers and extension personnel with instant feedback

2. Increased access to information: Cyber extension aids farmers with crop management, crop protection and prices information. The information can be accessible via online resources, mobile apps, or digital tools, benefitting those in remote or underserved areas

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3. Education: Detail information about farmers training and educational knowledge of his children about professional and non-professional institution.

4. Improved decision-making: Cyber extension enhanced the farmers' decision making with precise data for planting, harvesting, and marketing decisions resulting in higher profits, improved quality, and better yields.

5. Up gradation of research: the research workers and scientist can bring the modification and alteration in the quick manner due to instant feedback and easy access to information.

6. Enhanced productivity: ICT tools aid farmers by optimizing resource use and thus increasing productivity and reducing waste. For example, Drones, sensors, GIS and precision agriculture software

7. Weather: Daily information of maximum and minimum temperature, day length, direction and speed of wind, rain fall, relative humidity and weather forecasting.

8. Alert: Information regarding type of disaster, sudden change in weather, outbreak of diseases and insects etc.

9. Insurance: Detail information about insurance of farmers, his crop, animal and agricultural assets like tractors, implements and tools etc.

10. General awareness: Information about vaccination, cleanliness, health, family planning and nutrition. For example, COVID19 app provides information about corona virus precaution.

11. Rural Finance: Information about banking, micro finance and subsidy etc.

12. Animal Science: The detail regarding the local animal and well known diseases, better breeds, balanced feed, shed management, health etc.

13. Allied activities of agriculture: The famers can benefit from the allied activities like fisheries, bee keeping, minor forest produce etc.

Some of the benefits of ICT for the improvement and strengthening of agricultural sector in India include:

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- Timely information on weather forecasts and calamities
- Better and spontaneous agricultural practices
- Better marketing exposure and pricing
- Reduction of agricultural risks and enhanced incomes
- Better awareness and information
- Improved networking and communication
- Facility of online trading and e-commerce
- Better representation at various forum, authorities and platform, etc

17.5.1 Use of ICT in extension

There is various use of ICT in extension as suggested by Gopi R (2012). Some of the use of ICT in extension is mentioned below:

1. Social change: The role of communication is particularly important in relation to such social changes occurring in the modern world as socio-economic, environmental and developments in active components of society like family, women and young people.

2. Economic prosperity: ICT for economic prosperity indicates using it in an effective way to stream line administration, improve productivity in industry which in the long run will influence the performance of the economy.

3. Rural Development and food security: New ICTs have the potential for getting vast amounts of information to rural population in a more timely, comprehensive and cost effective manner and could be used together with traditional media and the greater tasks like rural development and food security will be achieved in the long run.

4. IT and poverty alleviation: IT provides citizens with information about market prices and social services, such as health, knowledge, education, jobs and investment opportunities and reduction in poverty level.

5. Empowering rural communities: ICTs can empower rural communities and give them a voice that permits them to contribute to the development process.

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6. Targeting marginalized groups: ICTs could benefit all stake holders including the civil society, in particular youth and women. Other disadvantaged groups that could be targeted include the disabled and subsistence peasants.

7. Creating employment: Through the establishment of rural information centers, ICTs can create employment opportunities in rural areas by engaging as tele centre managers, subject matter specialists, information managers, translators and information technology technicians

8. ICTs for improving linkages: ICTs can improve and strengthen these linkages can ensure knowledge and information, which are essential for an effective TOT.

9. e-Governance: Application of IT to governance in rendering administrative services - from ration cards, motor licenses, land records, health, education and municipal services.

10. ICT as an aid: The information services have to cater to the needs of common man in the areas like natural resources, energy, health and sanitation and employment.

11. Computers for productive rural banking: Almost 70 percent of bank branches are in the rural areas. Hence computers can be productively used to reduce the volume of work.

12. Distance education in computers: Ministry of education and various agencies provide Distance education in computers to the youth and others

13. Geographical Information System (GIS): are being used for mapping, analysing, planning and interpreting massive amounts of natural resources, topographic and demographic data - making this one of the most potent tools for planners.

14. Agri portal: An agri portal is a special website that adjusts dynamically to present targeted information according to a person's specific requirements. It is especially designed for agricultural and rural folks, to provide instant information on markets, news and weather.

15. Transfer of Technology (TOT) through web page, social media, mobile app etc.

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17.6 Tools of ICT in extension education

Cyber Extension plays various role and numerous cyber extension tools are available which applied for development process. There are various ICT applications available to simplify the operation for general purpose use to mission critical applications. The general purpose applications can be used to simplify the day-to-day operations in the organization. The following wide range of ICT tools are broadly categories into following purpose:

- Word processing applications are used for preparing text documents
- Presentation software is used for preparing presentations
- Spreadsheets is used for calculation and preparing tabular data with calculations
- Databases are used to store the information in the form of records and retrieving information using query mechanism
- Multimedia is used to organize the information more meaningful manner with the help of text, images, animation, audio and videos
- Web Browsers and E-mail are used to searching information and sending or receiving mail using Internet

17.6.1 Word Processing

Written communication plays vital role thus word processing software is used to manipulate a text document, such as a resume or a report.

- Creating, editing, saving and printing documents.
- Copying, pasting, moving and deleting text within a document.
- Formatting text, such as font type, bolding, underlining or italicizing.
- Creating and editing tables.
- Inserting elements from other software, such as illustrations or photographs.
- Correcting spelling and grammar.

17.6.2 Presentation Software

Oral presentation is supplemented by power point presentation nowadays. Presentation software is a category of application software that is specifically

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designed to allow users to create a presentation of ideas by stringing together text, images and audio/video. The presentation tells a story or supports speech or the presentation of information.

17.6.3 Spreadsheet

Microsoft excel is a powerful spreadsheet that is easy to use and allows you to store, manipulate, analyse and visualize data. It also supports data bases, graphic and presentation features. It is a powerful research tool that needs minimum of teaching. It not only makes statistics enjoyable, it also brings live to numerical work.

17.6.4 Databases

Proper documentation aids the significant dimension in the information and communication. Databases are collection of records, each record describing an entity such as book, journal, article or any other document or object in a machine readable form. They can be available on a range of media such as magnetic tapes, floppies, computer hard disks, CD- ROMs and video discs.

CD-ROMs are special laser based information storage media. In CD-ROM the data is greatly compressed or compacted and that it can only be read and not written. You can retrieve the information contained in it, but cannot add any new information; it is really a boon for developing countries like India where access to on-line services is very much limited.

17.6.5 Multimedia

Multimedia communication is the representation, storage, retrieval and dissemination of machine processed information expressed in multimedia such as text, voice, image, audio and video.

Interactive Computer Video Technology (ICVT): ICVT links the computer to audio-video reply in such a way as to provide the trainee with individualized truly interactive instruction. ICVT can contribute to resolving problems of relevant farm information and improve the quality of extension services.

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Interactive Video Disc (IVD) is one of the popular multimedia technologies, there is a video Disc player which access the video images stored on a two- channel audio-disc. Other media of information are text, graphics, animation and digitized audio which supplement the audio on the video disc.

Interactive multimedia compact disc (IMCD): IMCD is one of the most versatile audio visual medium of communication. It is very efficient, accurate, quick and somewhat cheaper in the field of disseminating the agricultural technologies from research system to the farmers.

Computer Assisted Instruction (CAI) is a natural outgrowth of the application of the principle of programmed learning. The computer can store a massive amount of organized information, which can be made available for individualized instruction to meet the needs of the particular learner. CAI can be arranged for teaching up to forty thousand learners simultaneously

17.6.6 Mobile Technology

This technology has provided new opportunities for rural farmers to obtain knowledge and information about agricultural issues, problems and its usage for the development of agriculture.

Mobile phones have provided new approach to farmers to make tentative decisions much more easily than before. Use of mobile phones leads to greater social cohesion and improved social relationships among farmers and business community.

Mobile phones technology uses the application of Internet, Wi-Fi, touch screen, Games and quizzes, social media etc

17.6.1 Application of Mobile Technology

It is important to bring new technology into the learning environment.

- Mobile learning can be used to diversify the types of learning activities students as well as other learners (or a blended learning approach).
- mobile can use as the focus group message dissemination related to innovation through social media

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- Mobile learning supports the learning process rather than being integral to it.
- Mobile learning can be a useful add-on tool for students with special needs.
- Agro advisory services through SMS to the farmers
- Mobile learning can be used as a 'hook' to re-engage de-motivated youth
- Relatively inexpensive opportunities, as the cost of mobile devices are significantly less than PCs and laptops
- Multimedia content delivery and creation options
- Continuous and situated learning support.
- Devices used are more lightweight than books and PCs.

17.7 Internet

It is defined as the network of the networks, which connects tens of thousands of computer connected to a worldwide network. In addition to a range of interpersonal communication application the internet is also used to support a range of interactive applications.

Network means it is a group of computers connected mutually for exchanging information and sharing equipments. Major goal of networking is communication, connectivity and resource sharing.

Internet is a network of networks connected through different types of communication channel to communicate irrespective of distance and time. The fundamental concept of internet is networking. When computers are connected together to share resources, it forms a network.

A network is formed to share hardware resources like printer / scanner and software / information like files, data base with other computers which eventually 'reduces cost'.

On the basis of Geographical area, they are classified into Local area network (LAN), Wide area network (WAN)

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Benefits of Internet:

1. Education: Internet is useful for distance education. It is a medium for interactive and collaborative learning. It can get additional Information by the learners, teachers, farmers and scientists.

2. Publishing: Newspapers, journal, magazine and newsletters are available on internet so publication is easy and accessible.

3. Shopping: E-commerce likes Purchasing, marketing, selling, buying is is possible

4. Advertising: Useful for advertising the products with text, graphics and pictures and video clippings.

5. Financial services: online banking, direct benefit transfer, credit transfer are taking place Stock broking and research reports on stocks are available and can be downloaded

6. E governance: Public information useful for every citizen can be kept on the net. Government services can be made available and can provide fast, transparent services through this.

7. Career: Career opportunities can be known with the help of net

8. Internet communication: Provides access to all kinds of information available on the latest technology in any field.

9. E-mail: Is the primary communication tool on internet. One can send and receive mails without any geographical barriers. We can send e-mail through websites like gmail.com, rediffmail.com, hotmail.com etc.

10. Lister: It allows group of people with common interest to send messages to each other at no cost.

11. Usenet News group: A newsgroup is worldwide platform for exchanging ideas and information by common minded people.

World Wide Web (www) is a network of information resources. The digital pages on www are called web sites. The first page of website is called Home page.

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Limitations of internet

1. Requirement of continuous power supply

2. Failure in network

3. Lack of knowledge for the people on use of internet

4. Selecting the required information in the net is difficult from the volumes of information

5. Sometimes it misleads the individual for wrong selection of information

6. Internet services are not available in rural areas hence farmers needs to travel to the urban areas to utilize the facility

17.8 Teleconferencing

Teleconferencing is the interactive exchange of information between individuals or groups in two or more locations through an electronic medium. It can bring people who are geographically isolated together, to express their view points and share their experiences.

Many teleconferencing systems with various shapes and diversified applications are available in the market. However, it is important for a user to understand the basic types of the system. There are three basic types commonly available for use.

This type of call is known variously as a conference call. Since it involves a telephone network, a teleconferencing call or sometimes an audio conferencing call

17.8.1. Audio Conferencing

Audio conferencing is the verbal communication through a telephone with additional capacity for tele-writing or tele-copying. A telephone or radio network may be used to prove audio communications among groups at two or more locations.

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17.8.2. Video Conferencing

It is also known as video conferencing. Exchange of video information and pictures between individuals or groups through specialized equipments a video channels added to an audio link between groups by means of satellite transmission, micro wave transmission or a two-way cable television system is video teleconferencing.

Experts sitting in the studios listen to the questions and answer live on television. The system reduces the need for travel and is of much help to the groups in remote areas.

17.8.3. Computer Conferencing

Computer based meeting involving exchange of voice and pictures between two individuals or groups using special software in a networked environment. Eg. Bulletin boards, groups, discussion forums, mailing lists, real time chat and email.

The advanced teleconferencing technologies offer integration of text, graphics, audio and video that can be transmitted over distances at a faster rate.

Teleconferencing has several advantages over conventional training methods such as reduce the time and resource requirements, cost of training can be reduced.

Voice mail

It is used in the event of the called party being unavailable. A spoken messaged can then be left in the voice mail box of the called party. This is located in a central repository known as the voice mail server. The message can be read by the owner of the mailbox the next time he or she contacts the server.

17.9 View data and Tele text

This transmits the information from a central computer by telephone line to the screen of a home television set or a computer. The amount of information the system can store is limited only by the capacity of its computer.

The farmer interacts with the central computer containing the database. He can request the computer to make certain calculation by combining information from the database with information from his own farm.

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It is a system somewhat like view data in which printed information is telecast through television rather than transmitted through a telephone line. It has no interactive capacity and it has a very much smaller database.

17.10. Micro Computer

Through a microcomputer on the farm, the farmers can process accounts and data from their farm production. Many extension agents in industrialized countries now have microcomputers and can make similar calculations for farmers.

17.11. Fax (Or) Facsimile

It is a device used for transmission of a written document, photograph, map or any other graphic, material electronically. It is one of the variants of E-mail. For transmission, the original documents placed in the facsimile or fax machine which scans the document and converts the written or graphic information into electronic signals and establishes a link up with a similar receiving fax machine at the receiving end.

The receiving fax reconverts the electronic signals into written or graphic form. As the sending machine scans the documents, the receiving machine reproduces the scanned image, which is an exact duplicate of the originals.

A typical fax machine can transmit a document of A4 size in less than a minute over thousands of kilometers. Since fax operates through the normal telephone lines the fax number is usually a telephone number.

In addition, the same STD and ISD codes are used for sending a fax to another city or another country. The document is scanned page by page in the fax machine. Like the E-mail, fax communication eliminates the postal delay and is very convenient for communication between persons located in different time zones, but it costs more than the E-mail.

17.12. Optical Communication Technology

Use of light waves for communication purposes gave rise to the modern technology of optical communication. In this new method, optical fibers that are

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very thin, long stands of ultra-purity glass are being used to link the transmitter and the receiver.

Information in the form of a series of light pulses produced by small semiconductor lasers is passed through such fibers. At the receiving end these light pulses are converted back into original information using appropriate detectors and decoders.

Human voice, TV pictures and computer data can be transmitted and received with great ease and convenience using optical fiber communication techniques.

17.13. Radio paging

It is called as poor man's cellular telephone, facilitating one way mobile communication to users. A person carrying a pager can be contacted while he or she is on the move, by his office or even others.

If one gets a message on his pager that he was required and should call up the number, which flashes, on his pager, all one needs to do is to go the nearest public call office and establish contact with his office.

In fact, an extensive page-phone network, in conjunction with radio paging, is a good substitute for cellular network. The pagers are particularly useful for professionals on the move.

17.14. Very Small Aperture Terminal Technology (VSAT) service

This service provides satellite-based network for business communication using the cost effective VSAT technology. All it does is to link head office of company or a corporate house to its various locations like factories, service units and other offices particularly those located in remote areas, using satellite network. Such networks are called Closed User Group (CUG) network. Besides high-speed data transmission from one location to another, people can even talk on the network.

17.15. Electronic Data Interchange (EDI)

It enables two organisations usually a customer and supplier to exchange routine documents such as purchase orders and invoices using standard electronic forms and their own computers linked through a service provider. It is faster. Cheaper

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and reliable means of exchanging export documents. It works on internationally accepted protocols and facilitates quicker exchange of documents.

17.16 ICT initiatives for agricultural development in India

ICT initiatives for agricultural development in India can be broadly in three ways viz; government initiatives, private and NGO sector and university level initiatives. Kisan call centre, village information kiosks, mobile apps, agri portal, expert system, e governance and e commerce project are the initiative taken for agricultural development.

17.16.1 Cybercafés / Information kiosks:

Computer multimedia system facilitates interactivity and better understanding between individual learners and the subject matter. These combine a variety of information sources into a variety of applications like electronic books, electronic magazines, information kiosks / cybercafés and interactive multimedia.

Kiosk is a small enclosed structure, often freestanding, open on one side or with a window, used as a booth to access to information in agriculture and allied areas.

Information kiosks are the public installations wherein computers are installed to make agricultural extension services accessible to people. These are information access system for public use.

Information kiosk is the hub of information as per the need of the area or the best source of information. For example, the information kiosks were installed at modern agricultural information center and at Agricultural Technology Information Center (ATIC) with touch screen operation in various state agriculture universities.

Any visitor to university can have access to any kind of information regarding package of practices, plant protection, nutritional deficiencies, symptoms of various pests and diseases of variety of crops and problems he encounters in the field.

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Just like ATMs they are developed and the information is made available to the farmers. Even video clippings along with voice can also be glanced and listened to the technological applications in local language.

He can see the visuals and interact with kiosk to get the desired information. He can elicit the expert information by pressing keys till his doubt is answered.

He can also follow the method of application of any technology through seeing of clippings in kiosk. In kiosk images were given, explanation of methods in voice, textual information is available in vernacular language.

17.16.2 Portal related to Agriculture development:

Agriculture portal are website that serves as a gateway or a main entry point ('cyber door') on the internet to a specific field-of-interest or an industry.

A portal provides at least four essential services such as search engine, email, links to other related sites and personalized content.

It may also provide other facilities such as chat, members list, free downloads, etc.

Agriculture portals are nothing but the logical next step in our four decades of progress in the modernization of agriculture. Portal is an information network.

It is a vast network of data lines will have to be laid, like World Wide Web. Agriculture portals will have to increase their depth, breadth and reach of services.

Significance of Agriculture Portal

A portal provides Internet users with a single, customized entry. Ultimately, all universities will use portal technology; it is when and how that is difficult questions, increased productivity, improved communication, possible revenue generation opportunities, and the prospect of building a stronger relationship within and among our constituents.

One potential benefit is that many of the technical issues that are addressed by a portal implementation, including authentication, authorization, and security, are aligned with the existing objective to improve the technology infrastructure both within and among the campuses.

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Agri Portal is available in different language such as English, Hindi and local regional language

http://icar.org.in, https://www.india.gov.in/

http://ecoursesonline.iasri.res.in/course/index.php, https://www.enam.gov.in/web/

17.16.3 KISAN CALL CENTRE (KCC)

KCC was launched on January 21, 2004 by the department of agriculture and cooperation (DAC) Ministry of agriculture, Government of India across the country to deliver extension services to the farming community.

A network of call centres have been established to cover the entire country in all the principal languages to enable the farmers get expert advice through a toll free number on 1800-180-1551(from any Landline or Mobile) and 1551 (from BSNL Landline) from any part of the country.

The service would be available 24 hours a day. While during office hours there would be immediate response, beyond office hours the call would be recorded and query answered by post. Call centre model utilizes the impressive telecommunication roll out in the country and acts as a basis for ensuring cost effective, strategically aligned, world class service to farmers.

Objectives of Kisan Call Centers (KCC)

For harnessing the state of art knowledge in the field of agriculture and related areas and delivering them through state of art technologies available for the dissemination to solve grass roots and everyday problems in farmers own language and context.

- To provide an IT enabled dynamic encyclopedia for use by farmers, agriculture extension works, agri-input dealers and other stakeholders in agriculture.
- To develop a data base which compiles and collates the actual needs of the farmers and to classify them in an intelligent format for use by policy makers, researchers, trade and industry.

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- To provide an opportunity to the scholars and the agricultural scientists to play a dynamic role in the transformation of Indian agriculture
- To establish a network of relationship among the scientists, policy makers, extension workers, farmers and other stake holders.
- To harness the traditional knowledge systems available with the farming community and with women farmers to enrich the body of knowledge in agriculture related fields.

Operational Mechanism

A Kisan Call Center consists of a complex of telecommunication infrastructure, computer support and human resources organized to manage effectively and efficiently the queries raised by farmers instantly in the local language. Mainly, Subject Matter Specialists (SMSs) using telephone and computer, interact with farmers to understand the problem and answer the queries at a Call Centre.

This is a functional area within an organization like Research Stations, ATICs, KVKs Agricultural Colleges, or an outsourced, where separate facilities exist solely to answer inbound calls or make outbound telephone calls, to resolve the queries of pending calls.

Usually it refers to a sophisticated voice operations center that provides a full range of inbound or outbound call handling services including customer support, direct assistance, multi-lingual customer support and other services.

This is a new dimension in Agriculture Extension Management, which takes account of, and makes full use of on-going information and communication revolution, by optimally utilizing the communication bandwidth to serve the farming community in remotest areas of the country by connecting them to best of the agricultural scientific community.

This is an important value multiplier for the existing extension mechanisms, which find it otherwise difficult (in terms of infrastructure and finances) to reach their desired clientele. This will enable establishment of close linkages and seamless communication mechanism among the key stakeholders in the extension system

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namely; Agricultural Scientists, Extension Functionaries, Farmers and Marketing Agencies. The kisan call centre consists of three levels – Level I, II and III.

1. Level I: (6.00 P. M – 9.30 A. M on gazette holidays)

The first level operator is an agricultural graduate with a rural background and knows the local language. They are expected to answer a majority of questions asked by the farmers. The details of the question and answers are fed into computer by operator.

In case the operator at level I is not able to satisfy the farmer, he forwards the call to the concerned subject matter specialist sitting anywhere in the state, in any institution, for giving advice.

2. Level II: (9.30 A. M. – 6.00 P. M. All working days during office hours)

It has subject matter specialists (SMS) who are at their respective place (Research stations, ATIC, KVK, agricultural colleges) of work. The I level operator forwards the call on 'call sharing mode' to level II centre & over 70% of questions from the I level get answered at this level.

The data relating to the caller including the question asked is also be transferred to the Level-II functionary on his computer along with the call. Hence, when the specialist takes the forwarded call, his computer also shows the data and question asked so that there is no repetition. It is envisaged that in normal cases, the entire spill over questions from the first level get answered at this level.

In case, it is not possible to answer, there is a system to revert back to the caller by post / fax / e-mail or by telephone in 72 hours. Govt. of India Identified ATIC of SAUs as Level II Centre

3. Level III: (The management group)

It consists of a dedicated cell located at the nodal office. This receives the questions that have not been answered at the first and second levels as well as IVR calls (Interactive voice recording). Appropriate replies to these questions are framed in consultation with the concerned specialists available within or outside

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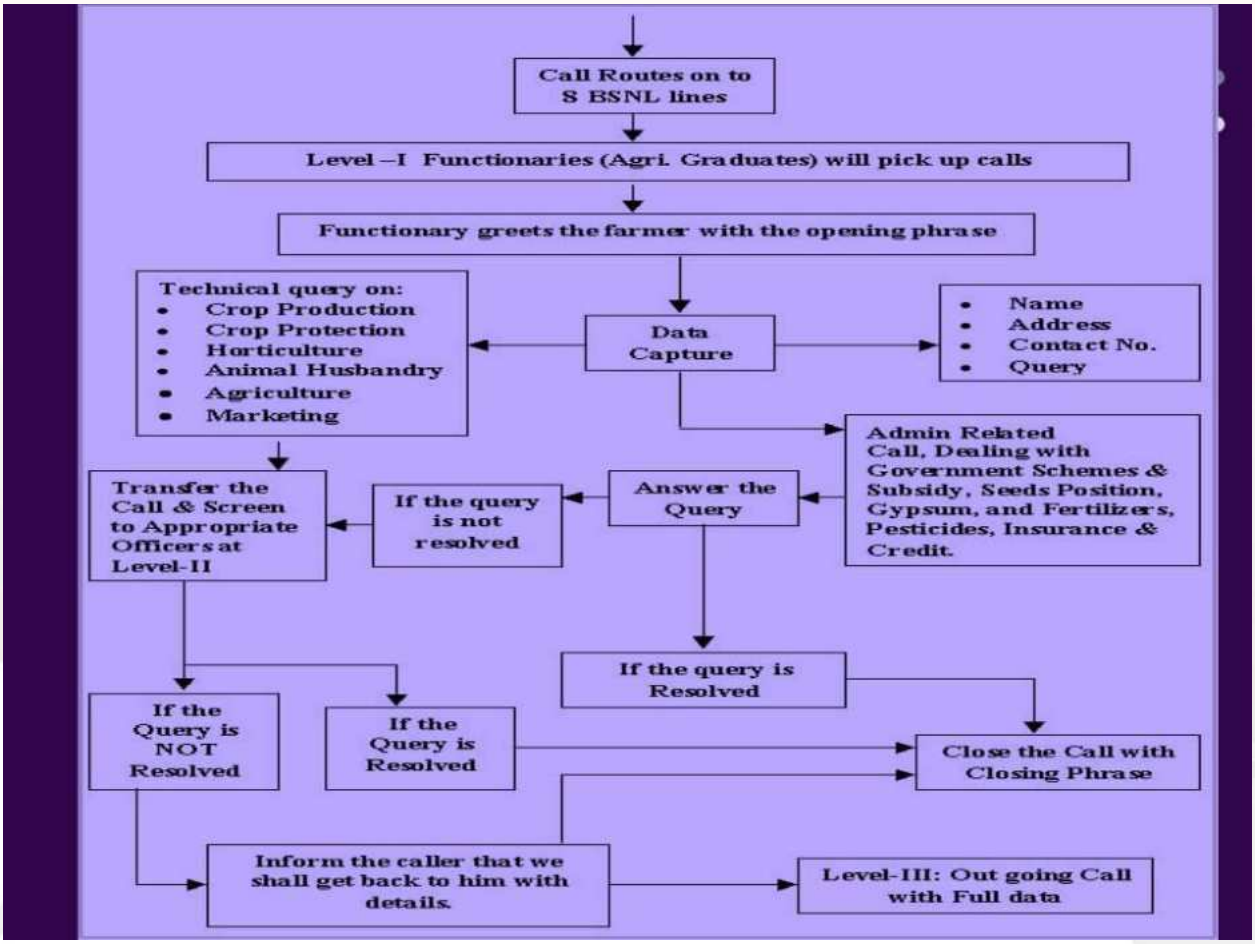
the state by the nodal cell. The replies are sent to farmers by post / e-mail / fax / phone within 72 hours of receipt of question.

Infrastructure: The Kisan Call Center infrastructure is placed at three locations such as i. a professionally managed Call Center (Level-I), ii. a Response Center in each organization, where services of Subject Matter. Specialists are made available (Level-II) and iii. The Nodal Cell (Level-III)

Fig.17.1: Mechanism of Kisan Call Center



Source- www.manage.gov.in/kcc.htm

17.16.4 Expert Systems

Based on Artificial intelligence (AI), a system model is designed to solve the problem of farmers. Expert system defined as a system that uses human knowledge captured in a computer to solve problems that ordinarily require human expertise.

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It is a computer application that solves complicated problems that would otherwise require extensive human expertise. To do so, it simulates the human reasoning process by applying specific knowledge and interfaces.

Expert system (ES) also uses human knowledge to solve problems that normally would require human intelligence. It represents the expertise knowledge as data or rules within the computer. These rules and data can be called upon when needed to solve problems.

Books and manual guides are having tremendous amount of knowledge but a human has to read and interpret the knowledge. The idea behind creating an ES is that it can enable many people to benefit from the knowledge of one person i.e the expert.

Components of Expert system

The expert system consists of the following components

i. User Interface

This is a mechanism to support communication between the user and system. The user interface may be a simple text-oriented display or a sophisticated, high resolution display. It is determined at the time of designing the system. Now-a-days graphical user interfaces are very common for their user-friendliness.

ii. Explanation Facility

It explains the user about the reasoning process of the system. By keeping track of the rules that are fired, an explanation facility presents a chain of reasoning that led to a certain conclusion. So explanation facility is also called justifier. This feature makes a huge difference between ES and other conventional systems. Almost all the commercial expert system shells do trace based explanation that is, explaining the inference on a specific input data set. Some systems explain the knowledge base itself and some explain the control strategy as well.

iii. Working memory

This is a database used to store collection of facts which will be used later by the rules. More effort may go into the design and implementation of the user interface

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than in the expert system knowledge base. Working memory is used by the inference engine to get facts and match them against the rules. The facts may be added to the working memory by applying some rules.

iv. Inference Engine

As the name implies the inference engine makes inferences. It decides which rules are satisfied by the facts, prioritizes them and executes the rule with the highest priority. There are two types of inference: forward chaining and backward chaining.

Forward chaining is reasoning from facts to the conclusion while backward chaining is from hypothesis to the facts that support this hypothesis. Whether an inference engine performs forward chaining or backward chaining entirely depends on the design which in turn depends on the type of problem.

Forward chaining is best suited for prognosis, monitoring and control. Backward chaining is generally used for diagnostic problems. Inference engine operates in cycles, executing a group of tasks until certain criteria causes that halt the execution.

v. Knowledge Acquisition Facility

This allows the user to enter knowledge in the system thereby avoiding the need of knowledge engineer explicitly code the knowledge. It is an optional feature on many ES. Simple rules can be created using rule induction. In rule based ES, knowledge base is Participants in ES Development

Domain Expert: The individual or group whose expertise and knowledge is captured for use in an ES

Knowledge User: The individual or group who uses and benefits from the ES. Users are the farmers, extension workers etc...

Knowledge engineer: Someone trained or experienced in the design, development, implementation, and maintenance of an ES.

Fig. 17.2 Expert System

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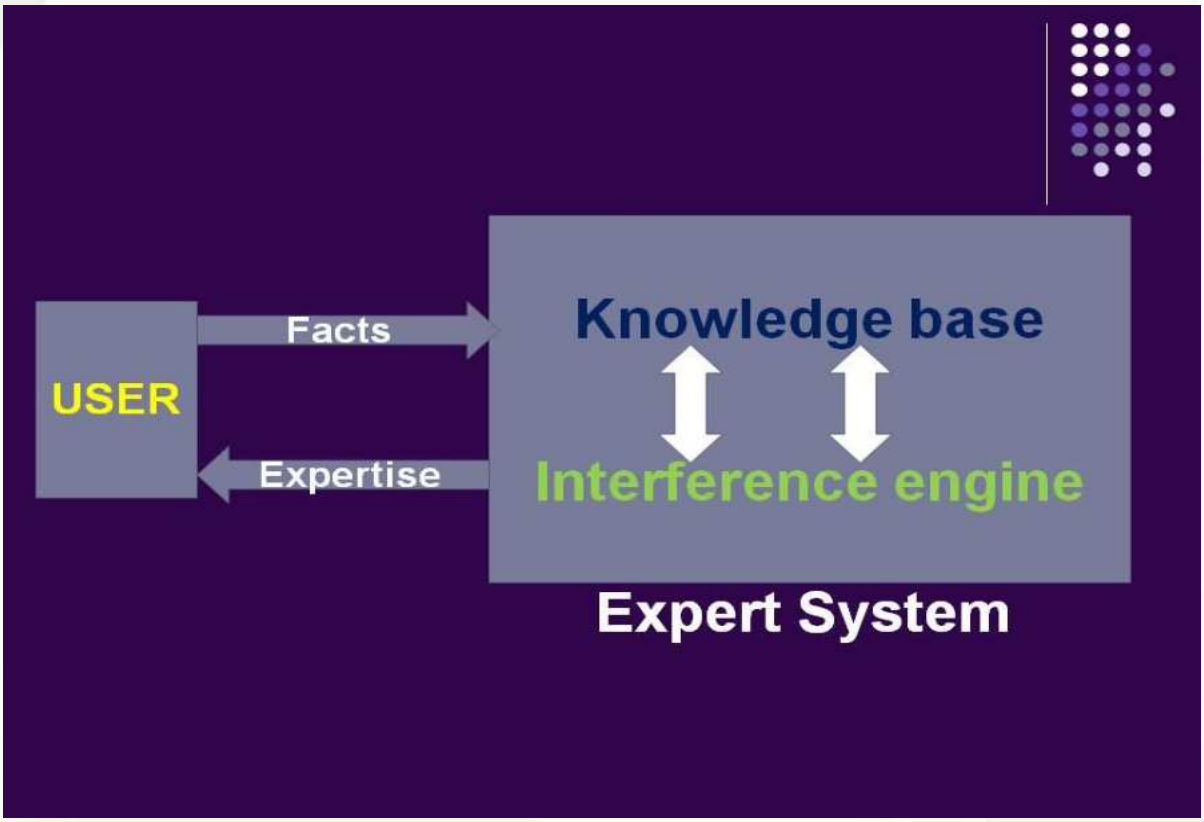

Advantages of Expert System

The significant advantages in the above mentioned ES are given below.

- The system can be used by extension personnel, researchers and farmers to identify crop diseases, pest and micro nutrient deficiencies and enable to precede their management.
- User can easily identify the pests, disease on the basis of photographs of symptoms and text descriptions of disease.
- The user friendly software developed using windowing environment, thus provides enough facilities to identify the disease and to suggest the remedy conveniently.
- Provide consistent answers for repetitive decisions, processes and tasks.
- Hold and maintain significant levels of information.
- Reduce employee training costs. Create efficiencies and reduce the time needed to solve problems.
- Combine multiple human expert intelligences.
- Reduce the amount of human errors.

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Disadvantages of Expert System

- Cannot make creative responses as human expert would in unusual circumstances
- Domain experts not always able to explain their logic and reasoning
- Errors may occur in the knowledge base, and lead to wrong decisions
- Lacks common sense needed in some decision making
- Cannot adapt to changing environments, unless knowledge base is changed

Rice-Crop is an expert system has developed by The MANAGE to diagnose pests and diseases for rice crop and suggest preventive/curative measures.

EXOWHEM Expert system on wheat crop management is an expert system which includes all aspects of wheat production on India.

AMRAPALIKA is an Expert System for the diagnosis of pests, diseases, and disorders in Indian Mango.

17.16.5 Drone technology

Now day's use of drone enhances the effectiveness and precision in the agricultural management. Drones aid agriculture by monitoring crops and collecting data on crop health, soil moisture, and precision spraying, leading to optimal resource utilization and reduced use of pesticides.

17.16.6 Information Village Shops

Information Village Project was conceptualized by the father of Indian green revolution M.S.Swaminathan. M.S.Swaminathan Research foundation is aimed at bringing the benefits of modern information and communication technologies to rural families in Pondicherry.

A value addition center is the hub of information network has been established in Villianur village and four information shops have been established in different villages. Through these information shops every morning the information is delivered to the farmers on weather forecasts, market prices, scientific technology etc.

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17.16.7 Warna Wired Village Project.

It covers 70 Villages in Maharashtra. In 1960, Tahasaheb Kore propagated the idea of cooperative in Warna nagar as a method of achieving socio-economic development. The wired village project was initiated by Mr. Vinay Kore, the son of Mr.Tahasaheb Kore.

This project was jointly implemented by Government of India (GOI) through National Informatics Centre (NIC), Government of Maharashtra and Warna Cooperative Society with the share of financial support being in the ratio of 50:40:10.

It allows internet access to existing cooperative societies. The aim is to provide information to villagers by establishing networked booths in the villages.

17.16.8 Honey bee knowledge network

Information and communication technology (ICT) helps to empower the economically poor people. Under the honey bee knowledge network of Indian Institute of Management, Ahmedabad a large number of grass root inventions (Indigenous technical knowledge or ITKs) have been identified and documented as short multimedia presentations. Database is created for these innovations and these are made accessible via wide area network.

17.16.9 E-Sagu Project

It is an agricultural information dissemination system. It is a tool for IT based personalized agro advisory system. It is personalized and cost-effective agricultural extension system. It aims to improve farm productivity by delivering high quality personalized agro expert advice in a timely manner to each farmer at his door step without farmer asking a question.

The project started in 2004 as a research project by International Institute of Information Technology (IIIT), Hyderabad and is funded by the NGO MEDIA LAB ASIA. The objective of e-sagu project is to increase the profitability of farmer by increasing the efficiency of agricultural input and reducing the cost of production.

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17.16.10 E-Chauppal

"E-Chaupal" the unique web based initiative of ITC (Indian Tobacco Company)'s International Business Division, offers information and communication technologies related to latest local and global information on weather, scientific farming practices and market prices through the web portal all in Hindi.

This project facilitates easy access of information by the farmers at their door step. Taking the literacy and infrastructure constraints at village level, e-chaupal Sanchalak a lead farmer is acted as the interface between computer terminal and the user farmers. It is a powerful illustration of corporate strategy linking business purpose to larger societal purpose.

Table 17.1: Some ICT project for agricultural development in India

Sl. No.	ICT project	Place
1	Information Village project of the M S Swaminathan Research Foundation (MSSRF)	Pondicherry
2	Warana Wired Village project	Maharashtra
3	Gyandoot project	Madhya Pradesh
4	Bhoomi project	Karnataka
5	Knowledge Network for Grass Root Innovations – Society for Research and Initiatives (SRISTI)	Gujarat
6	iKisan project of the Nagarjuna group of companies	Andhra Pradesh
7	Tarahaat.com by Development Alternatives	Uttar Pradesh and Punjab

17.17 Limitations of ICT in agriculture development

- ✓ Lack of Awareness and knowledge: Rural people are unaware of the latest technological trends in the industries. Farmers' deficit understanding about the ICT

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- ✓ Coordination: Lack of coordination may decrease the usefulness of ICT. Collective and coordinated mechanism is required between the agency, stakeholders, and government to develop a system for agricultural improvement.
- ✓ Lack of Connectivity: Lack of reliable internet connectivity and internet access are costlier
- ✓ Low Bandwidth and internet availability: Low bandwidth can limit effective service
- ✓ Easiness of system: Most of the contents are delivered in English and not in the local languages of the farmers which is not easy to use
- ✓ Orthodox and traditional mindset: The farmers are slow in the adoptability due to Illiteracy among farmers and stubborn conservative mindsets
- ✓ Difficult location and irregular electric supply to the rural areas

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