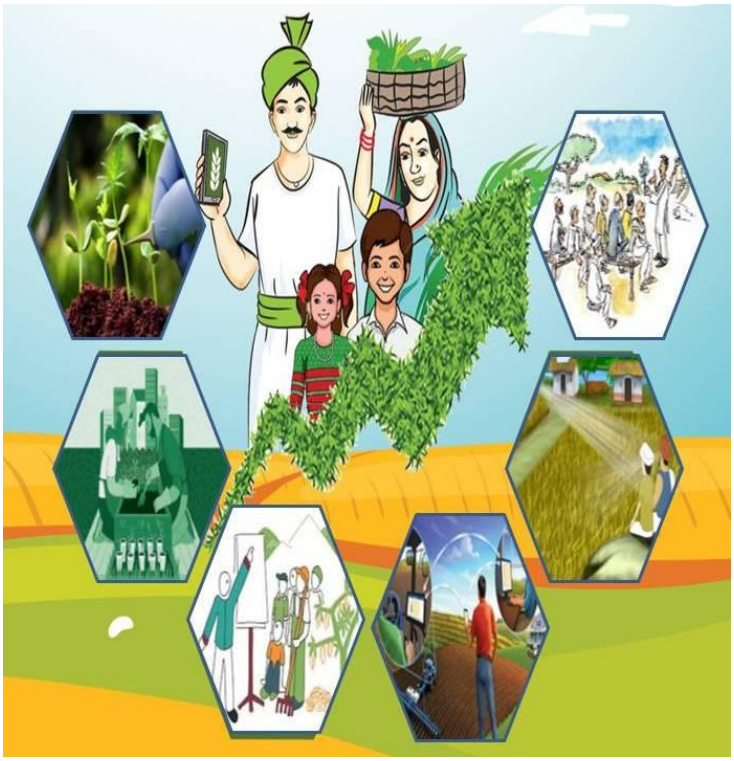
STUDY MATERIAL

AEX 328 –EXTENSION METHODOLOGIES AND TRANSFER OF AGRICULTURAL TECHNOLOGY (1+1)



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CONTENTS

LECTURE – 1

Extension Education – Meaning, definition and importance, Agricultural Extension – Meaning, definition. Linkage between Research, Extension and Clientele systems

Extension

Extension is the science of making people innovative, it is deals with people's knowledge and resources, encompasses all aspects of life and emphasizes on behavioural change of target communities.

The word 'extension' is derived from the Latin roots, 'ex' – meaning 'out' and 'tensio' meaning 'stretching'. Stretching out is the meaning of extension. The word 'extension' came to be used originally in USA during 1914 which means "a branch of a university for students who cannot attend the university proper. In other words, the word "extension" signifies an out-of school system of education.

Extension Education

Extension means the actual work done by extension agents at various levels of management. Education refers to the process of brining desirable changes in the behaviour of an individual. Extension education refers to 'the body of knowledge connecting that work practice'.

Definition

Extension education is an applied science consisting of content derived from research, accumulated field experiences and relevant principles drawn from the behavioural science synthesised with useful technology into a body of philosophy, principles, content and methods focussed on the problems of out of school education for adults and youth.– ***J.P. Leagans (1961)***

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

Extension is a programme and a process of helping village people to help themselves, increase their production and to raise their general standard of living. **– *D. Ensminger (1961)***

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. **– *O. P. Dahama (1973)***

Above definition, Extension may be defined as the science of budding competence of the people for sustainable development in their quality of life. Extension education main aim is human resource development.

Objectives of Extension Education

The main aim of Extension Education is to bring about all-round development of rural people. In this all-round development educational, social, economic and political developments are included.

Scope of Extension Education

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 utilization.
3. Conservation, development and use of natural resources.
4. Management on the farm and in the home.
5. Family living.
6. Youth development.
7. Leadership development.
8. Community development and rural area development.
9. Public affairs

Importance of Extension Education

Extension Education is primarily for the rural development. Its main objective is to bring necessary change in the beliefs or views of people. Extension education is an educational process by which capabilities among people are developed to understand their problems and resources. It is utilized to make scientific methods available to the rural people, so that they can raise their agricultural production and their standard of living. In India, the aim of extension education is community development, which is possible only by bringing change in the behaviour complex of rural people. Extension education plays major role in bringing desirable change in rural people.

In rural development or community development through extension education, the following functions should be performed:

1. Change in knowledge of the people–It implies bringing change in a person's present knowledge by providing information about latest developmental works, like, providing knowledge about new species. If a person is not aware of development works then information about it is imparted through training programmes.

2. Change in attitude of the people–The positive change in attitude of people towards the information given to them about latest developmental works should be brought about if a person believes that it is right for him then he will surely adopt it. In the same way there should be attitudinal change in the extension worker so that he can be able to increase the speed of development in the area by spreading new technique.

3. Change in skills of the people– Whatever work a person does, he should do so by adopting new technologies, which minimise his time, money and hardship and increases production and his income in proportionate way. Therefore, change in skills of people should be brought about. In similar way, there should be change in skill of extension personnel so that he could practically exhibit the new technique in the area and people can easily understand.

4. Change in understanding of the people–It is necessary to bring change in understanding of the people. He should believe that new/latest techniques, which are told to him, would be beneficial for him. Extension personnel should also understand that by imparting information about new techniques the people of the area will be benefited.

5. Change in goals of the people–If a person's aim is to grow only two crops in the field then he should be counselled that he can grow more than two crops in his fields and in place of food crops he should grow cash crops in some areas. This way he will have more profit and can aim for high crop production. Similarly, extension personnel should aim to spread this new technique in his area at certain period.

6. Change in action of the people–Extension worker should bring change in action of the people. People should be told to immediately make plans about the implementation of new techniques, which have been brought to their knowledge. In exactly the same way, extension personnel should plan the extension work immediately.

7. Change in confidence of the people–There should be change in confidence of the people that by adopting new techniques there will be definite increase in their net income. Similarly extension worker should have confidence that his extension work will definitely bring welfare of the society.

8. To develop the leadership–Extension worker should develop permanent leadership in village, who can adopt new technology and help in spreading the new technology.

9. Development of rural groups and rural institutions–In rural areas, collective change occurs very enthusiastically, therefore, it is necessary to develop rural groups in villages. By proper development of gram Panchayat, co-operative institutions and other institutions, greater cooperation is achieved in rural development; therefore, they should be developed.

Agricultural Extension

Agricultural extension is the application of scientific research and new knowledge to agricultural practices through farmer education.It means which aims at extending scientific knowledge of agriculture to the farming community.

Agricultural extension is a general term meaning the application of scientific research and new knowledge to agricultural practices through farmer education. The field of extension now encompasses a wider range of communication and learning activities organized for rural people by professionals from different disciplines, including agriculture, agricultural marketing, health, and business studies.

Definition and Concepts

Extension Education deals with practical items of information which is useful for rural people which solve their daily problems, especially those related to agricultural production.

Extension education is the dissemination of useful research findings and ideas among rural people to bring out desirable changes in their social and cultural behavior.

Agricultural extension was once known as the application of scientific research and new knowledge to agricultural practices through farmer education. The field of extension now encompasses a wider range of communication and learning activities organized for rural people by professionals from different disciplines, including agriculture, agricultural marketing, health, and business studies. – **MANAGE**

It is transfer of agricultural information and technology to the farmers and similarly transferring information from farmers to researchers. - **IGI global dictionary**

Agricultural extension (also known as agricultural advisory services) plays a crucial role in boosting agricultural productivity, increasing food security, improving rural livelihoods, and promoting agriculture as an engine of pro-poor economic growth.- **IFPRI**

Extension is an out-of school system of education in which adults and young people learn by doing. It is a partnership between government, the land grant colleges and the people, which provider services and education designed to meet the needs of the people.

Research – Extension – Clientele linkage systems

This is the most prevalent model so far, ever since the beginning of agricultural research and extension. Technological innovations generated in the right of basic science researches, in the work of industrialization, provided the basis for quantum leap in agricultural production. Thus, need for extending such technologies to farmers were felt so that farmer is motivated to adopt and diffuse, some of the features of this model area.

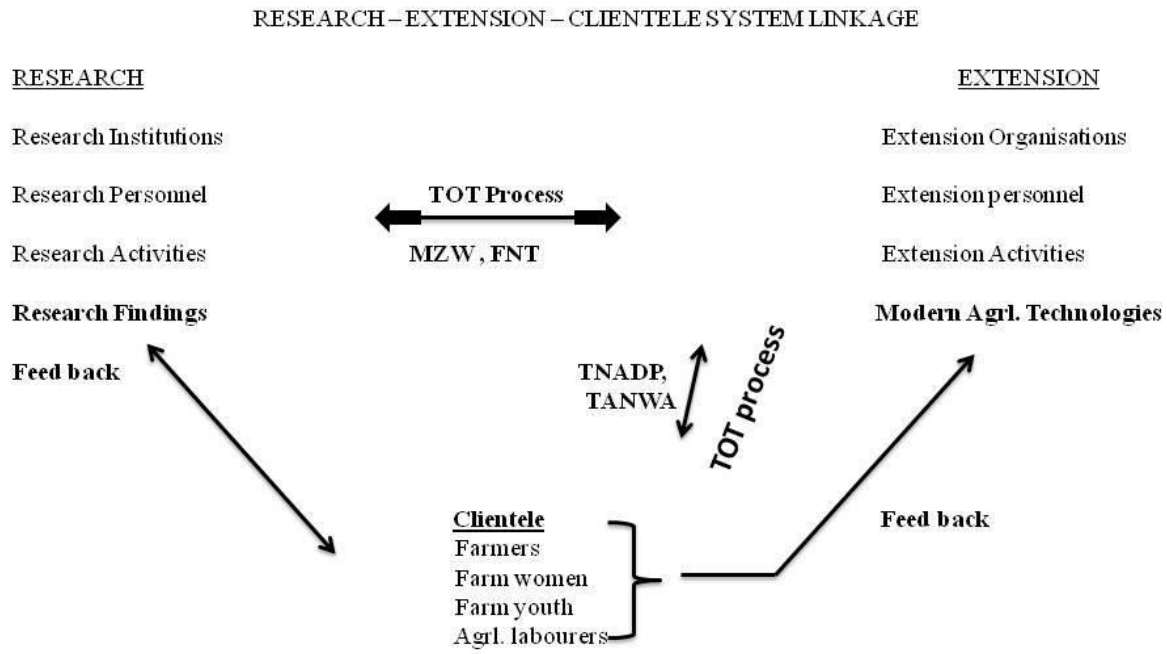
1. Technology generation was the role responsibility of the researchers. Interaction with farmers or extension personnel was not as relevant.

2. Farmers were seen as passive recipient of technologies.

3. There was little or no contact between farmers and scientists.

4. Role of extension was to persuade farmers to adopt new technologies.

Thus, this model suffered from feelings of superiority about scientists and technologies, Users' problems and views were not given consideration due for solving their problems. Such an approach was evident in green revolution.



LECTURE –2

TOT– Meaning and definition, components of TOT, models and approaches of TOT – Importance of TOT in Agricultural Extension

Transfer of Technology (TOT)

There is increasing use of the term transfer of technology by extension practitioners now-a-day. TOT is much wider term ad includes a 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 a linear process with distinct parts and roles of research, extension and farming system. It is 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 a broad definition of transfer of technology is provided by H. Books (1966) 'transfer of technology is the process by which science and technology are diffused throughout human activity'.

Meaning and Definition

Technologies transfer (TT), or transfer of technology (TOT), is an integral part of the extension process involving the transfer and spread of technical innovation and know-how to the farming population.

Technology transfer is a multi-level process of communication involving a variety of senders and receivers of ideas and materials. The challenges to technology transfer efforts center on developing indigenous capacity to generate and adapt agricultural technology to local conditions.

Components of transfer of technology

A basic function of extension is to assist the transfer of agricultural technology by ensuring that an adequate amount of high quality knowledge about it is present in the farming community. Helping farmers acquire this knowledge involves activity which needs setting in motion. Depending on whom it is, who takes this initiative, there are 3 approaches to extension work.

Consultancy

This approach involves providing advice on request. The initiative lies with farmers; they call on extension for a purpose which is determined by them.

Promotional

In this case the initiative lies with the extension agency. Account may be taken of the views of farmers, but decisions on what to do and how to do it are made by the agency.

Participative

This approach is a partnership between farmers and extension agency and the initiative is shared between them. Together they decide what technology is important. What information is required and how it should be provided.

Transfer of Technology Models

The present system of transfer of technology is least effective. Only 30 per cent of the technologies developed by research system are known to the clients whereas 70 per cent of them remain in the cold storage.

Conventional agricultural research and technology transfer efforts were more concerned with increasing production. Historically, TOT has occurred as a result of cultural contact and migration. However, transfer of agricultural technologies has been seen as the process of research, extension and farmers organization. The roles of each organization, extent of initiatives and interactions between each organization and tales and techniques of working have varied from time to time and place to place in view of the philosophical orientation about technologies and development.

Three major trends are the way of TOT is carried out. The oldest and most common approach is known by many names top-down/ conventional /normal.

Proposed Model for TOT

Level-I

SAUs were set up in India on the pattern of Land grant Universities of USA with integrated teaching, research and extension functions. Each SAU expected to perform some extension roles in the area under its jurisdiction. However, extension role of SAU was supposed to be

complementary to the major extension efforts made by state Department of Agriculture. SAU serve two important extension roles in the process of TOT. They are

- To undertake adaptive and operational research projects with a view to testing applicability of finding under different soil, agro-climatic and socio-economic conditions in the different parts of the reality in the generation of location specific and need based agricultural technologies.

- Collect process and disseminate latest research findings to extension personnel and extension clientele through appropriate methods and media by means of establishing good linkage with State departments of agriculture and other line departments concerned with agricultural development.

Level –II

The need-based location – specific IFS technologies are to be passed on by the line departments in a coordinated manner to NGOs and SHGs operated in a particular area at various levels. The major role to be played by the State Departments in the context of TOT are sensitizing, creating awareness, imparting knowledge and skill to farmers farm women and youth on new relation specific agricultural innovations through participatory learning processes such as brain storming, workshop, seminar, group discussions, meetings and periodical training programmes for the target NGOs and SHGs of particular locality.

Level – III

Keeping the strengths and weakness of government organizations in perspective, NGOs are in no way competing with Government departments rather, NGOs will supplement the government agencies in many ways. SHGs have to be formed for various commodities and enterprises. The technologies disseminated by the State Departments will be further passed on to the field level workers and other group members by the NGOs and SHGs respectively. They are expected to diffuse the appropriate IFS technologies to beneficiary groups and other members of the community either in one step or two steps in the case of SHGs and NGOs respectively.

The special features of the proposed model are:

i. Here the concept of TOT is group approach rather than individual family approach or contact farmer approach.

ii. The trickledown theory of technology transfer is considered for wider dissemination of agricultural technologies among the fellow farmers of a particular community.

iii. Participation of NGOs and SHGs in the process of TOT and Agricultural Development is emphasized.

The advantages of engaging and utilizing the NGOs in the TOT process because of its unique characteristics are as follows:

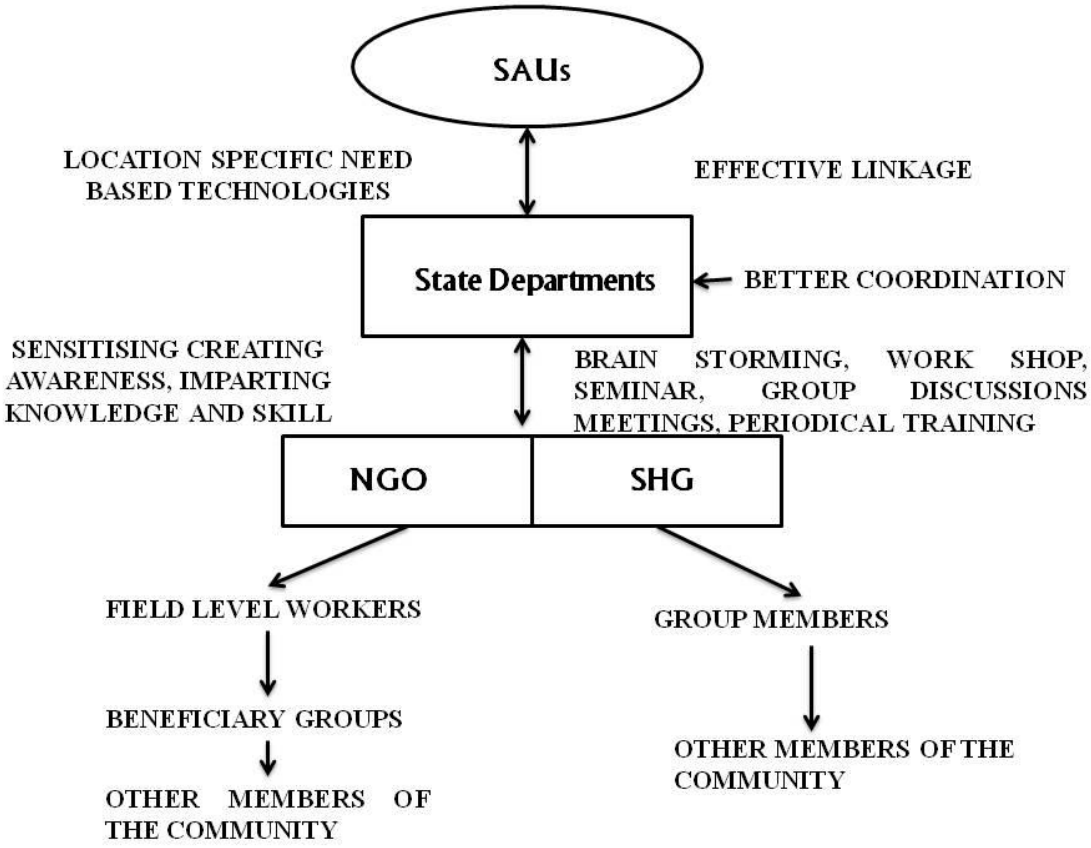
1. Cover limited geographical area.
2. Dedicated field level personnel.
3. Close and friendly rapport with clients.
4. Higher level of credibility.
5. Intensive approach.
6. Adequate infrastructure.
7. Effective monitoring and supervision
8. Provide physical support.
9. Provide financial support.
10. Extend technological support.
11. Work through identified leaders.
12. Help farming organizations.
13. Effective follow up.
14. Multi –dimensional efforts and approach.
15. Availability of adequate resources.

The advantage of forming SHGs for the purpose of TOT in agriculture is because of the following facts:

1. Organisation of the local people.
2. Consist cliques.
3. Transparent activities.
4. Help developing local leaders.
5. Standing example of success.
6. Respected by others.
7. Follow participatory mode.

8. Effective linkage with development personnel.
9. Serve as a model for others to follow.
10. Effective grape-vine type communication.
11. A reliable source of information.

The proposed model for TOT is illustrated as follows:



Proposed model for TOT

In the years to come it is essential to involve number of organizations along with the government agencies for achieving effective dissemination of farm technology. In that process the non-government organizations and self help groups can definitely be included.

The Transfer of Technology (TOT) Model and agri-support services

The TOT model is described to highlight the role of agri-support services in TOT. Mosher illustrated the concept of technology transfer based on what he called the "Achievement distribution" of farmers. If the assumption were made that farmers in a particular locality had

similar resources of land, labour and capital, then some farmers would achieve higher production than others and the actual production achieved by the best farmers never equaled the production that was possible from the application of the best management skills for that locality. When the farmers were ranked in terms of value added per unit area on their farms (i.e.) the combined value of all the resources used in producing these products.

- Markets for farm products
- Outlets for farm supplies and equipments
- Farm to market roads
- Favourable price relationships
- Favourable tenure relationships

One reason for the non-adoption of new technology by resource poor farmers is that many view profitability in terms or return per Labour Day worked, whereas the technology developed by research scientists is usually based on increasing yield per unit area. Research scientists at international research institutes are now giving more attention to technology development within farmer's resource constraints.

The Modified Transfer of Technology Model

This model was designed to explain the difference between the experimental station and farmer's field yield gaps. The first and smallest "yield gap" was the difference between experiment station yield and potential farm yield which was due to environmental difference (non-transferrable). The second and large "yield gap" was the difference between the potential and actual yield obtained on farmers' fields. This was due to the farmers using inputs or practices which result in lower yields than are possible. They found that the constraints to maximum production per unit area were biological and socio-economic. This led to a modification of the TOT model with on-farm research taking into account the farmers' resource constraints and recognizing the interrelationships and trade off between different farm enterprises.

These were largely due to the differences in the interests and perspectives of research scientists. There are also different perspectives between the research scientists and the farmers

to consider. During the design phase of the on-farm research, the priorities of the scientists would take precedence over those of the farm families.

The Farmer – First – And – Last Model

The justifications for explicit reference to equity in agricultural technology in the FFL model described are

1. Social justice, as three quarters of the farms in India is less than 2 hectares.
2. The potential for increased agricultural production is great
3. Employment opportunities would increase both on-farm and off-farm.

Chambers and Ghildyal envisage the technology generation as a synthesis of the indigenous farmer technology and the technical knowledge developed by research scientists. The institutional arrangement to develop this concept, however have yet to be worked out.

Importance of TOT in Agricultural Extension

Technology transfer was taken to mean a system under which various inter-related components of technology, namely, "hardware" (materials such as a variety), "software" (technique, know-how, information), humanware (human ability), "oraware" (organizational, management aspects) and the final product (including marketing) are rendered accessible to the end-users (farmers).

Technology transfer helps increase agricultural productivity, cut production costs, and lower consumer prices. The benefits depend on how the technology is transferred, the speed of transfer, and the degree of government policy influence on technology transfers.

LECTURE –3

Communication – meaning, definition, types and modules communication (Aristotle Shanon and Weaver, Berlo, Schramm, Leagans, Rogers and Shoemaker)

Meaning

Communication was a Latin roots 'communis' which means common – It also requires a degree of commonness between individuals for communication to occur. The purpose of communication is to establish commonness. Communication thus refers to the process of sharing information, feeling ideas in a manner that there is common understanding of meaning, intent and use of the message.

Definitions

Communication is the process of transmitting the common meaning of messages between individuals.

Communication is anything that conveys meaning that carries a message from one person to another. **-Brooker(1949)**

Communication is the mutual interchange of ideas by any effective means.

-Thayer (1968)

Communication is a purposeful process, which involves sourcing, messages, channels and receivers.

-Andersch et atl. (1969)

Communication is the process by which two or more people, exchange ideas, facts, feelings or impressions in ways that each gains a common understanding of meaning, intent and use of the message.

-Leagans (1960)

Communication is the process by which the messages are transmitted from the source to the receiver.

-Rogers and Shoemaker (1983)

Communication is the exchange of knowledge, skills and attitudes among persons.

-Wilbur Schramm (1956)

Communication is a process of relaying or transmitting a sign or symbol from a specific source to a specific audience by means of a media.

-Steinberg (1958)

Types of Communication

Formal and Informal Communication: Formal communication is restricted and controlled. Language selected is more precise with careful selection of words such as in formal meetings or official communication. In informal communication situation participants are less conscious and less regulated by each other such as gossips etc.

Intrapersonal: In this the messages are sent and received by the same individual. It is talking to one's self, listening to self and relating to self.

Interpersonal: It is the sharing of experience between two or more persons in a face to face situation. A very large portion of our communication is of this kind. Minimum two peoples are must in this communication. When two people are interacting with each other it is called dyad.

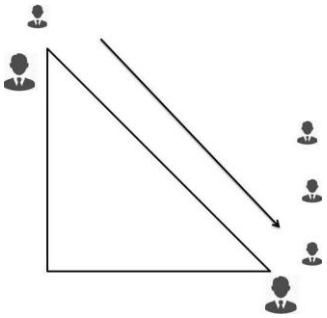
Mass Communication: Where a communicator uses print media, Public address System, radio or T.V. to communicate with a large audience. He may be in a face to face situation with the audience or at a distance.

Development Communication: Communication in this context of development may be defined as development communication.

Group Communication: It is the process in which communication takes place among the group of individuals. Normally the strength may be around 40 – 50.

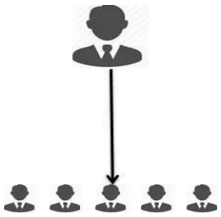
Diagonal (or) Cross Communication: Incumbents (officials holding a position) in any organization are naturally as also professionally interacting with each other diagonally. Such communication takes place more at the lower echelons (level of authority) and should be

encouraged and utilized by management. For adequate cross communication, meetings, conferences, bulletins can be utilized.



Diagonal communication

Vertical Communication: The flow of information initiates from the top levels to the bottom in the organization. The higher ups would like to send messages in the form of orders, directions or general educational news either written or oral at different levels of organization.



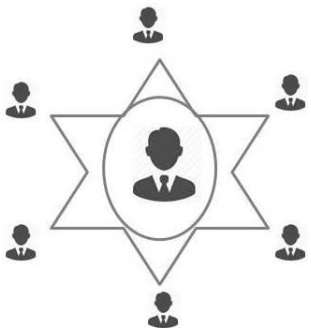
Vertical communication

Timeliness, quality and adequacy of information are mandatory and should be borne in mind. Employees must not be starved nor are they overfed.

Upward Communication: Two way communications is imperative in any communication process. In the context of Democratic Decentralization, upward communication, occupies a greater significance. Sometimes this may be futile due to slow, delayed, filtered and diluted and may be due to inconsistency with the linkages and attitude of higher officials.

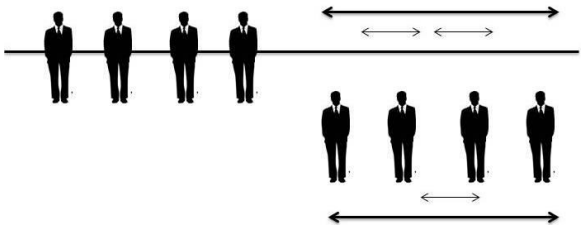
Upward communication

Star Communication: It is the process by which communication takes place from the boss (communicator) to all levels of subordinates and vice – versa. The periphery of the star represents the subordinates and the central crux of the star indicates the boss. It may lead to effectiveness and strengthen the relationship of subordinate.



Star communication

Lateral or Horizontal Communication: It is the process in which communication takes place within the same cadre. Hence there is no boss intervenes in the communication sequence.



Lateral communication

Models of Communication

Models are symbolic representations of structures, objects or operations. They are useful theoretical constructs that are frequently used in social sciences for explanatory purposes. They may be used to show the size, shape or relationship of various parts or components of an object or process. A model may also be useful in explicating the working of a system.

Berlo's model

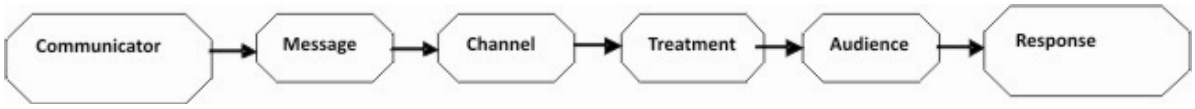
According to Berlo (1960) the model of communication consists of

1. Code is a system of signals for communication.

2. Encode means to put the message into code.
3. Channel means the medium through which the signals move.
4. Decoder means which converts the message in the code into ordinary language which may be easily understood.

Leagan's model

The communication model given by Leagans (1963) has the following elements-



The task of communication, according to him is to provide powerful incentives for change. Success at this task requires thorough understanding of the six elements of communication, a skillful communicator sending useful message through proper channel, effectively treated, to an appropriate audience that responds as desired.

Aristotle's Model of Communication

In the Rhetoric, Aristotle (384 - 322 B.C.) provides the first basic persuasive communication model He said that we have to look at three communication ingredients: namely the speaker, the subject and the audience. He meant that each of these elements is necessary to communicate and that we can organise our study of communication processes under the three headings:

i) the person who speaks,
ii) the speech that he produces, and
iii) The person who listens.

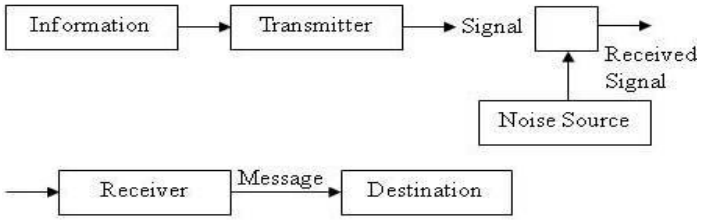
Aristotle's view of communication

Traditionally the creation of significant things to say by the source has been treated as 'rhetorical invention'. In classical antiquity a speaker was taught that five processes were involved in the study of communication, namely invention, organisation, language, memory and delivery. Message preparation, according to Aristotle, involved invention (finding material to be included in the message), arrangement (organising the material in any persuasive manner), language or style (to fit the speaker and the audience), memory and delivery (the practice of actual presentation). Invention was the most important to many rhetoricians, since the discovery of ideas was central to the whole process and all other elements seemed to emanate from it. Indeed, Aristotle uses 'discovery of the available means of persuasion' as his definition of the whole art of persuasive communication. Another implication of Aristotle's conception of rhetoric is that persuasion is contingent upon the Impression that a speaker creates or maintains. By and large Aristotle and later rhetorical theorists were interested in the ability to communicate effectively.

Many of our earlier communication models bear the imprint of Aristotle's model, although several new key concepts have been added. One of the greatest faults in Aristotle's theory was his view of persuasion as a one-way process flowing from the communicator to the receiver. He did not include in his writings the role that feedback can play in influencing the speaker.

The ***Shannon – weaver (1949) model*** is consistent with Aristotle's proposition. According to them, the ingredients of communication are –

1. Source
2. Transmitter
3. Signal
4. Receiver
5. Destination



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 to the destination.

According to Schramm (1964), the communication process involves-

1. Source
2. Encoder
3. Signal
4. Decoder
5. Destination

This model of communication is particularly relevant to the mass media. In human communication, it is more important whether people can properly encode or decode the signal (message), and how they interpret it in their own situations.

Rogers and Shoemaker (1971) thought of the communication process in terms of the S-M-C-R-E model, the components of which are –

1. Source
2. Message
3. Channel
4. Receiver
5. Effects

According to them a source (S) sends a message (M) via certain channels (C) to the receiving individual (R), which causes 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 (S-R) 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, a diagrammatic representation of the extension communication system on the basis of the model suggested by Leagans (1963).

Communication process

The process itself denotes any phenomenon which shows a continuous change in time. Like the river, the message also flows. If we accept the general idea of communication, we view events and relationships as dynamic, ongoing, ever changing and unceasing. You can counter argue that and cannot talk about the beginning or the end of communication or say that a particular idea came from one specific source.

LECTURE –4

Elements of communication and their characteristics – Barriers of communication

Elements of communication process

There are four basic elements in the communication process.

1. **Source:** To say the person whose ideas or meanings are to be transferred from the source to the receiver?
2. **Message:** Secondly, there must be a message that can be transferred from the source to the receiver.
3. **Channel:** Thirdly, message should have to travel through a channel or medium in order to make the passage from source to the receiver.
4. **Receiver:** Fourth element is the receiver, namely the person to whom the ideas or meanings are to be transferred.

Elements of Extension communication system

The elements of the extension communication system are discussed in brief. The characteristics of each of the elements, which may contribute to the sources or failure of communication, are furnished as per Leagans (1961).

I. Communicator

In the context of agriculture and rural development, extension agent is the communicator who starts the process of communication. The extension agent and mass media like radio are sometimes visualized as sources or originators of message, which is not correct.

Knowledge generates through research and as such the Research Institutes, Research projects, Universities are originators or sources of message. The extension agent obtains the required information from research and carries it to the audience, the farmers. The extension agent is the communicator, a carrier of information. To enhance the process, extension agents may take the help of some aids, known as audio- visual aids. They also carry back the reactions of the farmers, their problems etc. as feedback information to research, for finding out solutions for the same.

The credibility of the communicator and the organization the individual represents is important for effective communication. Credibility means trustworthiness and competence. Before the audience accepts any message it will judge whether the communicator and the organization the individual represents, can be relied upon and is competent enough to give the information. Studies have revealed that the scientists and extension agents having status, expertise, accomplishment, authority and experience are perceived as highly credible by the farmers in communicating information on agriculture and rural development. Who tells is, therefore, very important in extension communication.

Types of Communicator

Description of the communicator is to all those

- Change agents who influence others and change their attitude in a desirable direction.
- Extension workers – Communicate ideas to rural mass intended to give solution to problems.
- Scientists – Send the scientific findings or innovations to suit to the needs of farmers.
- Administrators – Communicate to their immediate subordinates to achieve the targeted goal for the growth of organization.
- Planners – Formulate policy decisions and then transmit them for an effective implementation among the social system.
- Key Communicators or opinion Leaders – Persons in any social system who are sought out for information and advice on general or specific topics. They have been variously called as fashion leaders, leaders, influencers, information leaders, opinion leaders, spark plugs, style setters, taste makers etc.

The characteristics of a good communicator are

The individual Knows

- The objectives – have them specifically defined
- The audience – their needs, interests, abilities predispositions
- The message - its content, validity, usefulness, importance
- Channels that will reach the audience
- Organization and treatment of the message
- The professional abilities and limitations

The individual is interested in

- The audience and its welfare
- The message and how it can help people
- The results of communication and their evaluation
- The communication process
- The communication channels – their proper use and limitations
- Improvement of the communication skill

The individual prepares

- A plan for communication – a teaching plan
- Communication materials and equipments
- A plan for evaluation of results

The individual has skill in

- Selecting messages
- Treating messages
- Expressing messages – verbal and written
- The selection and use of channels
- Understanding the audience
- 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's problems,
- Forget that time and energy are needed to absorb the material presented,
- Feel they are always clearly understood,
- Refuse to adjust to 'closed' minds,
- Talk while others are not listening,
- Get far too ahead of audience understanding,
- Fail to recognize others' view- point,
- Fail to recognize that communication is a two – way process.
- Let their own biases over- influence the presentation,
- Fail to see that everyone understands questions brought up for discussion,

- Fail to provide a permissive atmosphere,
- Disregard the values, customs, prejudices and habits of the people, and
- Fail to start where people are, with respect to knowledge, skill, interest and need.

To be a good communicator, the thumb rule is going to the village and listens to the people.

II. Message

The recommendations from research, the technology, constitute the content or subject matter, the message. Information which is relevant to a particular set of audiences constitutes the message, otherwise for them this is 'noise'. A good message should clearly state what to do, how to do, when to do and what would be the result.

To produce desirable changes in human behavior, the message must be motivating. Messages which are relevant, interesting, useful, profitable, credible (latest and best, based on research findings) and complete (neither too much, nor too little) are likely to motivate the people.

Characteristics of Message

A good message should be –

✓ In line with the objective to be attained

✓ Clear – understandable by the audience

✓ In line with the mental, social, economic and physical capabilities of the audience

✓ Significant – economically, socially or aesthetically to the needs, interest and values of the audience

✓ Specific – no irrelevant material

✓ Simply stated – covering only one point at a time

✓ Accurate – scientifically sound, factual and current

✓ Timely – especially when seasonal factors are important and issues are current

✓ Supported by factual material covering both sides of the argument

✓ Appropriate to the channel selected

✓ Appealing and attractive to the audience – having utility particular situation

✓ Adequate – combining principle and practice in effective proportion and

✓ Manageable – can be handled by the communicator and within the limits of time

In contrast, poor communicators often

- ❖ Fail to clearly separate the key message from the supporting content or subject – matter
- ❖ Fail to prepare and organize their message properly
- ❖ Use inaccurate or fuzzy symbols – words, visuals or real objects – to represent the message
- ❖ Fail to select messages that are in line with the felt needs of the audience
- ❖ Fail to present the message objectively – present the material, often biased, to support only one side of the proposition
- ❖ Fail to view the message from the stand point of the audience and
- ❖ Fail to time the message properly within a presentation or within a total programme.

III. Channel

Channel of communication constitutes the medium through which information flows from a sender to one or more receivers. Face-to- face, word-of-mouth is the simplest and yet one of the most widely used and effective means of communication, particularly for the developing countries. As society changes from traditional to modern, the emphasis shifts from oral to media system of communication, Because of the large number of audience or receivers of information, and because of physical distance of the communicator and the receivers of the information, it is necessary to use different media of communication. Even in interpersonal, face-to- face, word-of – mouth communication, it becomes necessary to use some aids to make communication more effective.

Types / classification of channels

The channels of communication may be classified into a number of ways according to different criteria.

According to nature

i) Interpersonal channels

These refer to those which are used for face to face communication between two or more individuals.

ii) Mass Media channels

Enable a source of one or a few individuals to reach in a relatively shorter time, an audience of diverse / many, almost simultaneously and may even be physically separated.

iii) Localities channels

Channels may also be categorized, depending on the place of origin Localities channels, such as neighbours, near beers, opinion leader etc originate within the social system of the receiver.

iv) Cosmopolite channels

They are the channels that originate outside a particular social system that likely to influence the receiver depending upon their communication skill and nature of receptivity of the recipients.

Eg. Typically it means the Extension workers and other sale agents, private firm workers, fertilizer dealers etc.

Interpersonal channels may be cosmopolite or localite, but mass media channels are always cosmopolite.

Comparison between interpersonal and Mass Media Channels

Characteristics	**Interpersonal**	**Mass Media**
Direction of message flow	Two way	One way
Speed to a large audience	Slow	Rapid
Message accuracy to a large audience	Low	High
Ability to select receiver	High	Low
Ability to overcome selectively	High	Low
Amount of feedback	High	Low
Possible effect	Attitude change	Increase of knowledge

According to form

- **Spoken:** Farm and home visit, farmer's call, meetings, radio talk etc.
- **Written:** Personal letter, farm publications, newspaper etc.

According to nature of personnel involved

Personal localities: They are the local leaders and local people who belong to the receivers' own social system. Personal localities channels are important in traditional social system.

Personal cosmopolite: these are the channels of communication from outside the social system of the receiver. They are the extension agents of various organizations and are important in changing the farmers from traditional to modern.

Impersonal cosmopolite: here the channels of communication are from outside the social system of the receiver and at the same time no personal face- to – face contact is involved. These are mass media, which are important in areas of high urban influence, and farmers who are modern or are changing from traditional to modern.

According to nature of contact with the people

Individual contact: The extension agent communicates with the people individually, maintaining separate identity of each person. Examples are farm and home visit, farmer's call, personal letter etc.

Group contact: The extension agent communicates with the people in groups and not as individual persons. Examples are group training, field day or farmers' day, study tour etc.

Mass contact: the extension agent communicates with a mass of people, without taking into consideration their individual or group identity. Examples are mass meeting, campaign, exhibition, radio, television etc.

Many obstructions can enter channels. These are often referred to as 'noise' that prevents the message from being heard by or carried over clearly to the audience. 'Noise' emerges from a wide range of sources and causes. The following are some of them

a. Failure of a channel to reach the intended audience. All people can't or may not attend meetings, all people may not have radio or TV, or may not be tuned if they had, or many people cannot others may not read the written materials

b. Failure on the part of the communicator to handle channels skillfully. In a meeting, who can't hear what is said and see what is shown, do not receive the message

c. Failure to select channels appropriate to the objective of a communicator. If the objective is to show how to do a certain thing, method demonstration and TV will be appropriate, rather than radio or newspaper

d. Failure to use channels in accordance with the abilities of the audience. Written materials cannot serve as useful channels of communication for an illiterate group of persons

e. Failure to avoid physical distraction. Loud noise near a place of meeting or load-shedding at the time of projecting visuals may cause distraction of the audience

f. Failure of an audience to listen or look carefully. There is a tendency of people not to give undivided attention to the communication

g. Failure to use enough channels in parallel (simultaneously). Research indicates that up to five or six channels used in combination are often necessary to get a message through to a large number of people with enough impact to influence significant changes in behaviour and

h. Use too many channels in a series. An important principle of communication is that the more channels used in a series (communicating through several levels of line personnel), the less chance a communicator has for getting the message through to the intended audience.

To help overcome some of the problems of communication, 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.
4. Channels are 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
7. Relative cost of channels in relation to anticipated effectiveness
8. Time available to the communicator and to the audience

9. Extent of seeing, hearing or doing that is necessary to get the message through and
10. Extent of cumulative effect or impact on the audience necessary to promote action.

IV. Treatment of Message

Treatment means the way a message is handled, dealt with, so that the information gets across to the audience. It relates to the technique or details of procedure or manner of performance, essential to effective presentation of the message. The purpose of treatment is to make the message clear, understandable and realistic to the audience.

Treatment of the message by the communicator shall depend to a great extent on choice of the channel and the nature of the audience. The task can't be reduced to a formula or recipe. Treatment is a creative task that has to be tailor-made for each communication function. For example, treatment of message will be different when it is conveyed in a meeting, or published in a folder or broadcast. Similarly, there will be difference in treatment of the message according to the level of literacy, socio-economic status and progressiveness of the audience.

Designing treatment usually requires original -thinking, deep insight into the principal of human behaviour, and skill in creating and using refined techniques of message presentation. The following are the three categories of bases useful for varying treatment.

Matters of general organization

i. Repetition or frequency of mention of ideas and concepts
ii. Contrast of ideas
iii. Chronological- compared to logical and psychological
iv. Presenting one side compared to two sides of an issue
v. Emotional compared to logical appeals
vi. Starting with strong arguments compared to saving them until the end of presentation
vii. Inductive compared to deductive
viii. Proceeding from the general to the specific and vice- versa and
ix. Explicitly drawing conclusions compared to leaving conclusions implicit for the audience to draw.

Matters of speaking and acting

- Limit the scope of presentation to a few basic ideas and to the time allotted many ideas at one time may be confusing
- Be yourself – you can't be anyone else, strive to clear, not clever
- Know the facts – fuzziness means sure death to a message
- Don't read your speech – people have more respect for a communicator who talks to the audience
- Know the audience – each audience has its own personality, be responsive to it
- Avoid being condescending (patronizing) –do not talk or act down to people, or over their heads. Good treatment of message results in hitting the target. Never overestimate the knowledge of an audience or underestimate their intelligence
- Decide on the dramatic effect desired – effective treatment requires since smoothness, enthusiasm, warmth, flexibility and appropriateness of voice, gestures, movements and tempo
- Use alternative communicators when appropriate, as in group discussion panels, interviews etc.
- Remember that audience appeal is a psychological bridge to getting a message delivered and
- Quit on time – communicators who stop when they have 'finished' are rewarded by audience goodwill.

Matters of symbol variation and devices for representing ideas

Spoken words, written materials, audio-visual aids etc. belong to this category.

V. Audience

The audience or receiver of message is the target of communication function. An audience may consist of a single person or a number of persons. It may comprise men, women and youth. An audience may be formed according to occupation groups such as crop farmers, fruit farmers, dairymen, poultry keepers, fish farmers, home- makers etc. Audience may also be categorized according to farm size such as marginal, small, medium or big farmers; or according to whether they belong to scheduled caste, scheduled tribe etc.

Communication, to be successful, must be target oriented. The communicator must know the target, their needs, interests, resources, facilities, constraints and even their approximate number and location.

The attitude of the audience towards the message largely depends upon who gives what message through which channel; to what extent the content of the message satisfy their needs and intentions; to what measures the suggestions contained in the message are in line with their pre-held experiences and pre-existing preferences; and, how far the message is compatible with group norms and value system to which the audience belongs. In case the audience members feel that the communicator is trustworthy, dependable and find the person communicating the message through the medium of their choice, they are likely to receive the message, provided the presentation of the content appear to the audience as interesting and comprehensive (Dey, 1993).

The communicator should, therefore, be careful in selecting message which are relevant to the audience, choose channels compatible to their cultural pattern and make treatment of the message appropriate to their levels of interest and understanding.

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 –

i. Communication channels established by the social organization
ii. The system of values held by the audience – what they think is important
iii. Forces influencing group conformity – custom, tradition etc
iv. Individual personality factors – change proneness etc.
v. Native and acquired abilities
vi. Educational, economic and social levels
vii. Pressure of occupational responsibility – how busy or concerned they are
viii. People's needs as they see them, and as the professional communicators see them
ix. Why the audience is in need of changed ways of thinking, feeling and doing; and
x. How the audience views the situation.

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.

Selecting 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.

The social categories to which people belong, their individual characteristics, and social relationship greatly influence their acquisition and utilization of information.

Audience segmentation

The concept of consumer segmentation used in advertising may be profitably used in extension communication. Market segmentation, according to Aaker, Batra and Myers (1992) is based on the observation that consumers differ and a single marketing programme directed to all of them is not always the best strategy. There are two different types of segmentation strategies. The first is the strategy of 'concentration' in which the organization focuses on only one subgroup and develops a marketing programme directed to it. The second is the strategy of differentiation in which two or more population subgroups are identified and marketing programmes are developed for each. If segmentation is not employed and a single marketing programme is developed and applied to all groups, the resulting marketing strategy is termed 'un-differentiation' or 'aggregation'.

Like consumers, farmers differ in their resources, facilities and constraints. Differentiation arises due to variation in specialization of their enterprises. They also differ in their needs and interests. Communication, therefore, can be made more effective by selecting specific target audience for each type of communication act, rather than making blanket communication for all types of programmes or clientele. For example, in communicating message for major cereals which are cultivated over a large area by a large number of others, the 'un-differentiation' or 'aggregation' strategy of communication may be employed. But differentiation in communication shall be useful for farmers growing cereals under acidity, alkalinity or water stress conditions. Similarly, the strategy of differentiation in communication shall be useful for farmers growing fruits and vegetables for export and processing, rather than general consumption within the country. For people growing only teak or Eucalyptus, or Arjun plants for Tasar rearing, the strategy of 'concentration' in communication shall be more effective, instead of blanket communication about social forestry programmes.

VI. Audience response

Response of the audience is the ultimate objective of any communication function. Response of an audience to messages received may be in the form of some kind of action, mental or physical. Until the desired action results, extension communication does not achieve it's most essential objective.

The possible kinds of response to messages received are almost infinite. The following gives an idea of possible variety in response that may result when a useful message is received by a typical village audience –

1. Understanding versus knowledge: people usually do not act on facts alone, but only when understanding of facts is gained. Understanding is attained only when one is able to attach meaning to facts, see the relationship of facts to each other and to the problem. Communication must promote understanding.

2. Acceptance versus Rejection: Audience response may be either way. Communication should lead to understanding and acceptance of the idea.

3. Remembering Versus Forgetting: When opportunity for action is not immediately available or action is delayed, the message may be forgotten. Transmitting the right message to the right people at right time is often a crucial factor in successful communication.

4. Mental versus Physical action: Changes in the minds of the people must always precede changes in the action by hands. People should not only understand and accept the message but shall also act on it.

5. Right Versus Wrong: The goal of communication is to promote desirable action by the audience as specified in the objective. If the response of the audience is in line with the objective, it is assumed to be 'right' action. However, 'noise' may prevent in getting the desired response from the audience.

Feedback

Extension communication is never complete without feedback information. FEEDBACK means carrying some significant responses 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.

Characteristics of Feedback:

- Feedback is source oriented,
- Feedback varies in different communication situations,
- Feedback affects the source or communicator,
- Feedback exerts control over future messages,
- Feedback affects communication fidelity, and
- Feedback maintains the stability and equilibrium of a communication system.

Feedback should he a continuous process as the audience and communicator are neither always the same persons, nor they are interacting in the same situation. The extension agent shall take steps to analyze the responses of the audience, which may be positive, negative, or no response. If there has been no response or negative response to a message, the extension agent shall find out reasons for the same. If it pertains to research, the problem should be referred as feedback information to research, to find out solutions for the same.

If the problem does not relate to research, the extension agent shall find out whether the message has been relevant to the audience, or whether the channel, treatment, audio-visual aids have been approximately used. If not, corrective steps should be taken without any loss of time. For a season- bound programme, if nothing can be done in that particular season the extension agent shall take appropriate steps next season, so that the mistakes are not repeated.

If there has been a favourable response to the message by the audience, the extension agent shall find out what next is to be done to reinforce the learning already made by the farmers. At this stage, supply of critical inputs and services including credit are important.

Adequate and correct feedback is essential for purposeful communication. Feedback information provides the communicator an opportunity to take corrective steps in communication work, helps in identifying subsequent activities, and acts as a pathfinder for need- based research.

If a communication source decodes the message that is encoded and, if the message is put back to the system we have feedback. In other words, action-reaction interdependence in communication is referred as feedback. The sender can use the reaction of the receiver as a check of his own effectiveness and a guide to his own future action. When a source receives feedback that is rewarding, he continues to produce same kind of message. If he gets non-rewarding feedback,

- He eventually will change his message.
- It concerns with to and fro communication. This return process is called feedback.
- It serves to control and correct the signals within the network in relation to one another.
- It also serves to realign all the signals within the network in relation to one another.
- Feedback is an error correcting mechanism that would overcome noise.
- We often overlook the strength and power of the feedback. We fail to realize the extension to which the receiver affects communicator. In case of mass media, drastic changes are made as a result of the feedback obtained in the form of opinion polls, attitude surveys etc.
- Communication research bears testimony, that learner perceives better gain, more knowledge and retention longer when changes for feedback are provided.
- Person to person communication permits maximum feedback.

- The source has an opportunity to change the message on the spot as a result of the feedback. It can be concluded that gain in knowledge is directly proportional to the amount of feedback.

Barriers/ Problems in communication

Communication is a process. Process is the act of preceding a series of actions or operations definitely conducting to a desired end**.**

Each episode of communication has at least three phases:

1) Expression
2) Interpretation
3) Response.

These are the crucial points in communication. If the expression is not clear, the interpretation will be inaccurate and the response improper, thus one's effort to communicate will not succeed. In other words, if the source does not have adequate or clear information if the message is not encoded fully, accurately, effectively in transmittable signs; if these are not transmitted fast enough and accurately enough, despite interference and competition, to the desired receiver; if the message is not decoded in a pattern that corresponds to the encoding; and finally if the destination is unable to handle the decoded message so as to produce the desired response, then, obviously, the system is working at less than top efficiency.

Main problems in communication:

These are:

I. The problems that the individual has in fulfilling his own goals and adoptive needs – logically they have their origin in the adequacy and the appropriateness of his own strategies or technical communication competence.

II At the inter-personal level, communication problems may be sourced in the relative inadequacy or inappropriateness of the communication competence of any, or all, of the participants. That is, any given problem may be attributable to one or the other, or to both persons engaged in a two person communication encounter.

III An originator or a receiver may fail to achieve his communicative goals or intentions for reasons other than the skill and comprehensibility involved. There are situations in which intercommunication is satisfactorily achieved but the consequences anticipated by the receiver for doing, thinking, or feeling as intended by the originator are so negative as to preclude the fulfillment of the originator's intentions.

A Communication system which links two or more people together may be more efficacious, more or less, economical, or both. Often the source of this order of communication problem is in the inappropriate designation of criteria by which the system's progress is to be assessed.
Yet another higher-communication problem of some complexity is the organizational level of analysis. It is at this level of analysis that we should contemplate problems which have their source in the relative incompatibilities of communication system at their interfaces. Those incompatibilities may emerge at the interfaces of different levels of systems.

These problems of communication process can be classified by various methods. Some of these methods are:

I. According to phases of communication:
II. According to various types of problems.
III. According to nature of problems
IV. Other classified problems

I a) Relating to the communicator:

1) **Ineffective environment**: The environment created by the communicator (Extension worker) influences his effectiveness. The physical facilities, air of friendliness, respect of other's point of view, recognition of accomplishments of other, permissiveness and rapport in general, are all important ingredients of a climate which is conducive to effective communication.

2) **Disorganized efforts to communicate**: to make sense, the communication effort must be organized according to some specific form or pattern.
3) **Standard of correctness**: This involves the use of correct words or other symbols, correct logic and correct content or facts.

4) **Standard of social responsibilities**: This infers that when one communicates, one assumes responsibility for effect of one's communication on the respondents and the society.

5) **Cultural values and social organization**: Cultural values and social organization are determinants of communication. For effective communication, the communicator must possess knowledge of the cultural values of his listeners.

6) **Inaccurate symbols**: The system of symbols used to represent ideas, objects, or concepts must be accurate and used skillfully. The crucial point in the use of symbols to convey ideas is to select those that accurately represent the idea to be conveyed and are understood by the audience. Symbols are meaningful to a person only when he understands what they stand for.

7) **Wrong concept of the communication process**: A common mistake communicated by the communicator is the identification of the part with the whole or the parts fallacy. A successful communication programme of rural development is not a single unit. It requires a series of unit acts. The way one thinks about communication will influence its quality.

b) Relating to transmission of message:

Many obstructions can enter at the interpretation level. 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. 'Noise' emerges from a wide range of sources and causes which effect the interpretation of the message.

1) **Wrong handling of the channel**: It can be a meeting, tour, radio programme, or one of the Other channels, if is not used according to the correct procedure and techniques, its potential for carrying a message is dissipated.

2) **Wrong selection of channels**: All channels are not equally useful in attaining a specific objective. Failure to select channels appropriate to the objective of a communicator will interrupt the interpretation of the message, in the manner in which it is desired, by the intended audience.

3) **Physical distraction**: Failure to avoid physical distraction often obstructs successful message sending.

4) **Use of inadequate channels in parallel**: The more channels a communicator uses in parallel, or at about the same time, the more chances he has of the message getting through and being properly received.

c) Relating to the receiver:

1) **Attention of the listeners**: There is an unfortunate tendency not to give undivided attention to the communicator. This is a powerful obstruction that prevents the message from reaching its desired destination.

2) **Problem of cooperation, participation and involvement**: Both the communicator and the receiver must be brought into the act. Hence, the listener must work a little hard. Learning is an active process on the part of the listener and unless the respondent is on the same wave length, the character of what is sent out hardly governs the communication process. Thus, it takes two to make communication.

3) **Problem of Homogeneity**: The more homogeneous an audience, the greater the chances of successful communication. Likewise, the more a communicator knows about his audience and can pin-point its characteristics the more likely he is to make an impact.

4) **Attitude of the audience towards the communicator**: An important factor in the effectiveness of communication is the attitude of the audience towards the communicator. It is a function of the communicator to make their attitude favourable. Indirect data on this problem comes from studies of 'prestige' in which subjects are asked to indicate their agreement or disagreement with statements which are attributed to different individuals.

II. According to various types of problems:

These are (1) Technical problems; (2) Semantic problems; and (3) 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 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.

III. According to nature of problems:

1) **Physical problems**: The possible disorders affecting communication fall generally into the following categories. Speech and voice defects; anxiety-tension reaction such as those involved in stage fright, or feeling of inferiority, which noticeably affect speech, paralysis, disease or characteristics of physical appearance which interfere with expressive bodily action or which tend to call forth unfavourable reactions on the part of the listeners; lack of skill in the use of background or staging techniques, together with defects, such as radio station in the means and conditions of transmission.

2) **Psychological:** These psychological difficulties are, in part, a function of the very nature of language; in part, they are due to the emotional characteristics, and mental limitations of human beings. These general considerations concerning the psychological nature of language are the background against which more specific difficulties in communication can be understood. These specific obstacles merit special attention: (i) the failure to refer language to experience and reality, (ii) the inability to transcend personal experience in inter-group communication, (iii) stereotypes, the assimilation of material to familiar frames of reference, (iv) the confusion of precept and concept, ramification and personification.

3) **Cultural**: Cultural differences pose serious barriers in the communication process. Within this expanding field of activity, we may distinguish three small questions: (i) the way in which communication systems are related in given cultural values, (ii) the particular ethical problems of responsibility raised by our current use of communication systems and (iii) problems of communication when cultural boundaries have to be transcended.

IV. Other classified problems:

1) **Entropy and redundancy**: Information is defined in terms of its ability to reduce the uncertainty or **disorganization of a communication situation at the receiving end.** Entropy Simply means the uncertainty or disorganization of a system, redundancy is the opposite.

2) The idea of noise is another information theory concept which intuitively makes sense in the study of communication. **Noise is anything in the channel other than what the communicator puts there.**

3) Error can be reduced as much as desired by keeping the rate of transmission below the total capacity of the channel. If the channel is overloaded, errors increase very swiftly.

4) One of the major problems of communication policy and techniques is to find way of controlling the interpretation which an audience will place upon events and notions.

Coupling: Is another point at which information theory comes very close to our way of thinking about human communication. We are accustomed to think of gate keepers. Every system that couples two other systems is a gate-keeper. How likely are they to pass on the information that comes to them? How faithfully are they likely to reproduce it? This all depends upon their gatekeeper.

Message Distortion:

When the transmitted message by the communicator is not reproduced by the receiver in a pattern that corresponds to its original form it is distortion.

According to Kirk (1963), the distortion of information may be of three fundamentally different kinds.

1) Systematic or stretch distortion,
2) Fog distortion and
3) Mirage distortion.

1) **SYSTEMATIC or STRETCH** - Some part of information will be given too much importance. No information is lost rather it is changed or recorded.

2) **FOG** - Some part of the information (information is lost) will be masked away.

3) **MIRAGE** - Some part of information (extra and unwanted) will be added as an extinct.

LECTURE –5

Extension teaching methods – Meaning, definition, functions and classification. Individual contact methods – Farm and home visit, Farmers call, Personal letter, Result demonstration.

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.

Meaning and Definition

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.

Functions

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.

Classification

Wilson and Gallup (1955) classified extension teaching methods according to their use and form. Bains (1987) attempted to classify them according to their use, form, stages of learning process, stages of adoption process, categories of adopters, initial cost involved, cost per unit of results obtained, skill required in using them, time consumed in using them and according to behavioural changes intended. However, most of these classifications are only of academic interest. The most widely used as well as useful classification of extension teaching methods is a according to use.

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.

Classification of communication Methods

I. According to Use

Individual Contact	**Group Contact**	**Mass Contact**
Farm and home visits Personal letters Office calls Flag method Agrl. Clinics	Meetings Method demonstrations Result demonstrations Conducted tours Training camps Crop schools Peripatetic team meetings Media forums Agrl. Games	a. Broad cast media Radio recordings, Educational television b. Printed media, Farm journals, Extension pamphlets, Bulletins, Leaflets, Circular letters c. Screen media, Slides, Film strips, Movies, Video

		recordings d. Others, Exhibitions, Campaigns, Farmers fairs

II. According to form

1.Written	2.Spoken	3.Visual	4.Spoken and Visual
Bulletins Leaflets Personal letters Circular letters Farm journals	Meetings Farm and home visit Office calls Radio recordings Flag methods Agrl. Clinics	Result Demonstration Exhibits Posters Charts Slides Film strips Flash cards Flannel groups Bulletin Boards	Method Demonstrations Result Demonstration Television Movies Puppets Campaigns

III. According to function

1.Telling	2.Showing	3.Doing
a. Lecture b. Conference c. Panel and forum d. Recordings e. Farm and home visits	a. Written words b. Pictures and motion pictures c. Posters, charts, exhibits etc., d. Demonstration e. Tours	a. Practical b. On the job training c. Demonstrations d. Guided experiences e. performance

IV. According to the stages of Innovation decision process

1.Knowledge	2.Persuasion	3.Decision	4.Implementation
1.Radio and Television 2.Printed matter	1.Meetings 2.Training Method 3.Demonstration	1.Result demonstration 2.Farm and home visits 3.Office calls	1.Result demonstration 2.Personal visits

3.Posters and wall, 4.Newspapers 5.Circular letters	4. Printed matters	4.Friends and relatives	3.Local leaders

V. According to the stages of learning process

1.Attention	**2.Interest**	**3.Desire**	**4.Conviction**
1.All mass Contact Methods	1.Meetings 2.Tours 3.Demonstrations 4.Appeal to values 5.Personal visits	1.Demonstrations 2.Circular letters 3.Meetings 4.Local leaders	1.Result demonstration 2.Personal visits 3.Friends and relatives
5.Action		**6.Satisfaction**	
1. News stories and other printed matters 2. Farm and home visits		**1.** Personal contacts **2.** News stories **3.** Field days	

VI. According to the learning objectives

1. Knowledge	**2. Skills**	**3. Attitudes**
1. Printed matters 2. Lectures 3. Guided discussions 4. Tours 5. Case studies	1. Demonstrations 2. Case studies 3. Supervised practices	1. Training courses 2. Demonstrations 3. Lectures by the experts 4. Film shows

VII. According to adopter categories

1.Innovators	**2.Early Adopters**	**3.Early Majority**	**4.Late Majority**	**5.Laggards**
1All mass Contact Methods	1.Farm and home visits 2.Demonstrations	1.Result demonstration 2.Posters	1.Result demonstration 2.Friends and	1.Local leaders 2.Tours

2.Office calls	3.Meetings	3.Tours and filed days 4.Exhibition, film shows etc.,	relatives 3.Tours 4.Exhibition, film shows etc.,	3.Friends and relatives

VIII. According to adaption process

1. Awareness	**2. Interest**	**3.Evaluation**	**4. Trial**	**5. Adoption**
Printings Personal contacts Film shows Radio, television, posters, local leaders, newspaper, campaign, leaflet, banners, tom – tom, circular letters, slide.	Personal contact, meetings, radio talk, leaflet, folder, bulletin, farm journal, film, slide, filmstrip, recorded cassettes, DVD/ TV.	Demonstration followed by discussion, cassettes, field trips, farmers experiences in any printed form, field day.	Personal contact, method demonstration, result demonstration, leaflet, folder, farm journals, field trips, field days, TV/ DVD.	Group discussion, Method demonstration, Result demonstration, field trips, slide, self-experiences, leaflets, folder, farm journals, training campaign.

Individual Contact Methods

In this method, the extension agent communicates with the people individually maintaining a separate identity of each person. This method is followed when the number of people to be contacted are few, are conveniently located close to the communicator and sufficient time is available for communication.

Individual methods

1. Farm and home visit
2. Farmer's call
3. Personal letter
4. Adaptive or mini-kit trial
5. Farm clinic

Advantages

1. Helps the extension agent in building rapport.
2. Facilitates gaining first -hand knowledge of farm and home.
3. Helps in selecting demonstrators and local leaders.
4. Helps in changing attitude of the people.
5. Helps in teaching complex practices.
6. Facilitates transfer of technology.
7. Enhances effectiveness of group and mass methods.
8. Facilitates getting feedback information.

Limitations

1. This method is time consuming and relatively expensive.
2. Has low coverage of audience.
3. Extension agent may develop favoritism or bias towards some persons.

Farm and Home visit

Farm and Home visit is a direct face- to –face contact by the extension agent with the farmer or home maker at their farm or home for extension work.

Objectives

1. To get acquainted with and gain confidence of farmers and homemakers.
2. To obtain and / or give first hand information on matters relating to farm and home.
3. To advice and assist in solving specific problems and teach skills.
4. To sustain interest.

Technique

Planning and preparation

1. Decide on the audience and the objective – whom to meet and what for?

2. Get adequate information about the topic. Contact research if needed.

3. Collect relevant publications and materials to be handed over

4. Makes schedule of visits to save time and energy.

5. If possible, send advance information.

Implementation

1. Visit on the scheduled date and time or according to convenience of the farmer and when the person is likely to listen.
2. Create of the farmer and allow the individual to talk first.
3. Present the message or points of view and explain up to the satisfaction of the farmer.
4. Answer to questions raised and clarify doubts. Hand over publications.
5. Try to get some assurance for action.

Follow -up

- Keep appropriate records of visits.
- Send committed information or material.
- Make subsequent visits as and when necessary.

Limitations

- Only a limited number of contacts may be made. Time consuming and costly method.

Farmer's call:

Farmer's call is a call made by a farmer or homemaker at the working place of the extension agent for obtaining information and assistance.

Objectives:

1. To get quick solution of problems relating to farm and home.
2. To enable the farmer and homemaker to bring specimens for proper identification of the problem.
3. To ensure timely supply of inputs and services.
4. To act as a reminder to the extension agent.

Limitations

- Being away from the situation, it may be difficult for the extension agent to understand the problem in its proper perspective.
- Extension agent may not be available all the time.

Personal letter

Personal letter is written by the extension agent to particular farmer or homemaker in connection with the extension work.

Objectives

1. To answer to queries relating to problems of farm and home.
2. To send information or seek cooperation on important extension activities.

Techniques

- Send the letter in time or if a letter has already been received send a prompt reply.
- Content should be clear, complete to the point and applicable to the farmer's own situation.
- Use simple and courteous language.

Adaptive and mini-kit trial

It is a method of determining the suitability or otherwise of a new practice in farmer's situation.

Objectives

- To test a new and promising practice under the resources, constraints and abilities of the farmer.
- To find out the benefits of the new practice in comparison to the existing one.
- To buildup confidence of the extension agents, research workers and farmers.
- To act as a precaution against insignificant, faulty or hasty recommendations.

Limitations

- Being scattered the trials may suffer from lack of adequate supervision of the extension agent.
- Satisfactory results depend on the clarity of objectives and careful selection of the practice and the farmers.

Farm clinic

Farm clinic is a facility developed and extended to the farmers for diagnosis and treatment of farm problems and to provide some specialist advice to individual farmers.

The extension agency may set up farm clinics in the village and / or in the organization's head quarters and sub- centres, where the relevant subject matter specialist in collaboration with the extension agents, discuss, diagnose and prescribe treatment to farmer's problems. The specialists may visit the local area if needed for an on the spot diagnosis and guidance or follow- up. This method is suitable for treatment and prevention of health problems relating to plants, animals and soils.

LECTURE –6

Group contact methods – Method demonstration, group meeting, small group training, field day or farmers' day, study tour, lecture, debate, workshop, seminar, forum, conference, symposium, panel discussion brainstorming, buzz session

Group Contact Methods

A group may be defined as an aggregate of small number of people in reciprocal communication and interaction around some common interest. In this method the extension agent communicates with the people in groups and not as individual persons.

Group Methods

Result Demonstration

Result demonstration is a method of motivating the people for adoption of a new practice by showing its distinctly superior result. This is a very effective method for the transfer of technology in a community. A great advantage of demonstration is seeing how an innovation works in practice.

Objective

1. To show the advantages and applicability of a newly recommended practice in farmer's own situation.
2. To motivate groups of people in a community to adopt a new practice by showing its result.
3. To build up confidence of the farmers and extension agents.
4. To develop innovation leadership.

Technique

Planning and preparation

- Analyse farmer's situations and select relevant practices.
- Select a responsible and co- operating farmers.
- Select representative locations for conducting demonstration.
- Prepare a calendar of operations.

Implementation

- Explain the objectives and steps.
- Organize materials and equipments.
- Give adequate publicity.
- Start the demonstration on the scheduled date and time.
- Put up suitable sign board to be colorful, visible with local language.
- Take photographs.
- Analyse and interpret the results.
- Emphasize applicability of the new practice in farmer's situation.

Follow- Up

- Use the results of demonstration in future and disseminate through media.
- Utilize demonstrating farmers in meetings and training.
- Prepare visual aids for future use.
- Avoid conducting demonstration with the same farmers.

Limitations

- Need more time, energy and funds.
- Unsuccessful demonstration may cause setback.

Method demonstration

A method demonstration is given before a group of people to show how to carry out an entirely new practice or an old practice in a better way.

Objectives

1. To teach skills and stimulate people to action.
2. To get rid of inefficient or ineffective movements.
3. To improve upon the result by doing a job in a better way.
4. To build up learner's confidence and satisfaction on the practice.

Technique

Planning and preparation

- Decide on the topic, audience and venue.

- Select most important topic for immediate use.
- Contact subject matter specialist.
- Collect relevant information, materials and equipments.
- Practice the demonstration stepwise.
- Decide on the time and date in consultation with the local leaders.
- Complete all arrangements.
- Display diagrams, charts, graphs at demonstration site.

Implementation

- Start the demonstration on the scheduled date and time.
- Show each operation step by step and explain clearly why and how it is being done.
- Ensure that all the participants have seen and understood. Repeat difficult steps.
- Invite the participants to practice the skill and clarify their doubts.
- Hand over the relevant publications.

Follow- up

- Keep a record of the participants and maintain contact with them.
- Assist the participants in getting the required materials and equipments.

Limitations

- Suitable mainly for practices involving skills.
- Needs good deal of preparation, equipments and skill of the extension agent.

Group Meeting

Group Meeting is a method of democratically arriving at certain decisions by a group of people by taking into consideration the members point of view. Group discussion is a very important extension method to influence participant's behavior. It plays an important role in increasing knowledge and changing attitude.

Objective

- To prepare a favourable climate for discussion, pooling the knowledge and experience of a number of persons.
- To facilitate in- depth discussion.
- To generate new ideas and methods

- To develop a favourable attitude and commitment.

Technique

- Decide on the topic to be discussed and persons to be involved.
- Start the meeting on the scheduled date and time.
- Introduce the topic and initiate discussion.
- Allow the members to talk and interact.
- Assist the group to take decisions and record of important points.
- Remind the members of the discussion, encourage and assist them to take action.
- Arrange inputs including credit.
- Sustain interest through personal contact.

Limitations

- Requires understanding of group dynamics and skill of the extension agent.
- Village factions may hinder successful.
- Group members must have self – discipline.
- A slow process may not be suitable in emergency.

Small group training

Small group training is a technique of imparting specific skills to a group of people who need them by creating an appropriate learning situation.

Objectives

- To impart the needed skills to a small group of people.
- To motivate people to adopt new practices through skill training.

Techniques

- Identity a technology.
- Decide on the time and duration.
- Prepare a training programme.
- Select trainers with rich field experience and knowledge.
- Collect relevant materials, publications and audio- visual aids.

- Make arrangements for registration, food and accommodation
- Allocate responsibilities to suitable persons.
- Start the programme on the appointed date and time.
- Give enough time for discussion and the trainees to react.
- Explain the relevant technology why and how it should be done.
- Arrange practical demonstration and give enough time to each trainee for practicing the skill.
- Clarify doubts.
- Arrange a film show on the topic.
- Maintain contact with the trainees.
- Encourage and assist them to apply the new practice.
- Remove hindrances.

Limitations

- A small number of people may be trained at a time.
- Follow up requires more staff and time.

Field day/ Farmer's day

Field day/ Farmer's day is a method of motivating the people to adopt a new practice by showing what has actually been achieved by applying the practice under field condition.

Objectives

- To convince the participants about the applicability of the practice in their own situations.
- To motivate them to adopt the practice.
- To remove doubts, superstitions and unfavorable attitude towards new technology.
- To reinforce previous learning about the practice.

Technique

- Decide about the practice, location, date, time and the participants.
- Contact subject matter specialist to ensure participation.
- Make arrangements for display of exhibits, registration, public address system, vehicles and other facilities.

- Welcome all the participants on their arrival.
- Specialists explaining the practice and replying the visitor's questions.
- Distribute publications and sample packets.
- Maintain contact with the participants.
- Reinforce learning through mass media.

Limitations

- Field days cannot be held frequently.
- Does not facilitate in-depth learning.

Filed Trips

Understanding of facts and materials in the real life situation is possible by arranging field trips. The field trips, bridge the gap between the real life situation and classroom teaching. Reality in extension education is a must to understand how exactly the farmers operate under field, conditions. The field trip helps us to go to different places of importance and see the things as they are. The things to be seen by a field trip ranges widely according to the subject matter and the needs of the farmers. In extension we can arrange field trips to show a result demonstration plot, an improved livestock farm, places of professional importance, marketing centers, technical centers, agro firms and research Institutes. Through field trips, we can help the learners to see the real world with their own eyes, create awareness of the problems and things of interest and initiate action.

Deciding about opportunities

A detail survey of the various opportunities available in the locality to organise a field trip is the first and foremost step in arranging a field trip for the extension teaching learning process. No field trip possibilities in the local areas should be overlooked. The local farms wherein the success stories of implementation of various improved practices are available, the field research stations of the agricultural universities and research institutes, district livestock and poultry farms, demonstration units and model farms of block development agencies, industrial technical centers etc., are some of the locally available opportunities one can always think for and utilize properly. The subject specific selection of the field trip visit centers is a must to derive the desired impact out of the trip. Selecting the local farms always needs careful consideration of facts such as the farm owner's willingness to permit the visitors,

cordiality, willing to share the techniques followed with others and other local socio cultural factors. Some of the following suggestions shall be considered while selecting a field trip site.

Criteria for field trips in extension

- Will it be helpful to the learners?
- Will it be suitable for the subject matter under discussion?
- Will it be possible to arrange it within the stipulated time framework?
- Will it be suitable or convenient for the group members to undertake the field trip?
- Will it produce the desired learning impact?
- Will it provide the desired experience to the learners?

A guide sheet or a check list Performa

Objective of the study

To understand the principles and practices of cattle management under intensive system

Place of visit	**:**	**Date**	**:**
Person to be contacted:		**Date**	**:**
Time:			
Things to be seen	1)	Number of persons:	
	2)	Male: Female:	
	3)	Name of the tour officer:	

Mode of travel	:	Approximate Expenses	:
Place of stay and boarding	:	Special preparation, if any	:
Emergency help	:	Climate/weather at the time of visit	:
Finance	:	Vehicle permit, condition etc.	:

Approval, gate pass for other important points if any entry and permission details:

I. Determine the subject matter suitability for conducting the trip.

II. Distance and easy accessibility need to be considered.

III. It should emphasise on one particular idea and a specific thing.

IV. The practical problems such as getting permission, active cooperation from the places of visit and socio cultural situation or suitability,

V. The cost involved in arranging the trip, number of participants, their interest to visit a place among the available opportunities and their time suitability need to be considered.

VI. Finally, the other factors such as boarding, staying, climate and weather and time suitability for a field trip to the place of choice is to be analysed well.

Guide sheet for Field trip

A guide sheet provides the details of places of visit, time and hours of visit, persons to be contacted, things to be observed, important points to be noted, transport and staying arrangements, route plan, boarding arrangements and other essential things that are to be followed or taken care of during the trip. A guide sheet or a trip shall be planned and prepared in advance and get it approved before concerned members. A typical guide sheet should contain the following details.

- Place of visit.
- Date, time and hour of visit.
- Mode of transport.
- Staying and boarding arrangements.
- Contact persons.
- Things to be seen, specific places, instruments and observations to be dealt with.
- Preparation and facilities for unforeseen illness.
- Finance planning, approvals to be obtained.
- Permit details for the places of visit.

How to Arrange a Field Trip?

Proper planning of the field trip is an essential aspect to determine the success or failure of the trip. Learning effectiveness cannot be achieved by just arranging a field trip as a routine. Basic preparations, ground work planning and programme development are some of the essential aspects that are need to be taken care of. A guide sheet or a checklist (see box) has to be prepared to avoid what we have to do situation. The arrangements and preparations required for conducting field trips differ according to the subject matter, participants, time period, place of visit etc. However, the following suggestions are basic and are applicable to the majority of field trip situations arranged in extension.

1. Write down the specific aims and objectives of the trip,

2. Select the appropriate place of visit in consultation with colleagues, participants and other resource persons.
3. Visit personally to the selected place and collect the first hand information about the place of visit,
4. Talk to the in charge of the centre of visit and find out their willingness to accept the visitor and for possible cooperation.
5. On coming back write a formal letter to the in charge of your field visit site for getting their approval on a given date and time.
6. Prepare a checklist or guide sheet for the field visit,
7. Arrange for transport, boarding and lodging facilities,
8. Appraise the details of the visit to every participant and clear their doubts if any.
9. Limit the group to a maximum of 25-30 farmers.
10. Make sure each participant knows what to observe and study.
11. Be punctual and stick on to the programme.

Advantages of field trips

1. Field trips bring emotional participation among the learners.
2. Effective linkage between the real situation and class room teaching.
3. Helps to see the things in their real settings.
4. Recognition of the field problems by the participants.
5. Brings attention and arouse interest among the participants.
6. Facilitates interaction among the participants.
7. Helps the participants to clear their doubts and improve their level of understanding.
8. Gives an opportunity to know the things as they are when practiced.
9. Improves their practical knowledge due to real life exposure.
10. Kindles the thought and initiates action.

Effective use of field trips in Extension

A field trip should be well planned and conducted in order to achieve the learning effectiveness in the extension teaching programmes. The fields trips are used in the extension to I) introduce a subject matter or an innovation to the farmers (iii) make the participants to understand specific information (iii) convince them with the reality of the situation. (v) Acquire firsthand knowledge and practice the skill required. (v) Show them the gap between

where they are and where others are. vi) Solve their problems and doubts under practical situation and (vii) motivate for action. To achieve the maximum benefits through the field trips, the following are some of the points to be considered by the extension workers.

a. Preparation of the participants: The participants should be initially prepared for his effective participation in the field trip. The participants should be appraised about the importance of field trip, various points to be observed during the visit and how the knowledge about various things is helpful to them. The use of visual pictures, slides and other AV aids will help the participants to understand the purpose of the visit and important things to be learned from the visit. Specific information regarding time, location, preparations required things to be carried along with them and individual guide sheet are need to be provided with every participants.

b. **Conducting field trip:** To avoid any confusion arising in, carefully follow the plan according to the programme sheet prepared. The points noted in the guide sheet should. Be strictly adhered. Be punctual in your, trip and involve the volunteers among the participants to assist you in the arrangements. Make photographs of various events during field trips and keep them in record. Other than photographs, slides or video programmes can also be made for future use in the class. On completing the field trip carefully acknowledge all those who helped in conducting the trip successfully.

c. **Follow up:** After conducting the field trip, ask the participants to discuss among themselves and to submit a brief report about what they feel about the field trip. Such reports help to understand the mind of the participants and useful feedback can be obtained. In case of illiterate farmers, arrange a discussion so that they can express their feelings openly. On knowing the feedback from the participants their doubts can be cleared and additional information's and explanations about the specific points shall be provided to them. Then correlate the trip to the specific problems and discuss them with the participants.

A Comprehensive report on field trip can be prepared by indicating the objectives, place of visit, participants, the experience gained during the trip, the difficulties experienced and the suggestions for future. This may help as the review at appropriate time and make future course of action.

Study Tour

In study tour a group of interested persons accompanied and guided by one or more extension agents moves out of their neighborhood to study and learn significant improvements in farm and home elsewhere. The main purpose is to motivate the visitors by showing what others have been able to achieve.

Objectives

- To expose the visitors to a new and different situation this shall help in changing their outlook and extend their mental horizon.
- To understand the gap in technology adoption.
- To explore the feasibility of adopting new practices in visitor's own situations.
- To induce a spirit of competition amongst the participants by showing what others have been able to achieve.

Techniques

- Decide on the objective, number and type of participants, duration and places to visit.
- Arrange for accommodation, conveyance, tickets etc.,
- Make correspondence well in advance and confirm the programme.
- Finalise the travel plan in discussion with the participants.
- Communicate the programme to all concerned persons.
- Keep the interest of the group uppermost in mind.
- Let everyone see, hear, discuss and if possible participate in the activities at the places of visit.
- Collect publications for the participants and help them to take note of interesting and useful information.
- Take photographs and provide for recreation and sightseeing. Look to the comfort and safety of the group.
- Let the representatives of the group share the responsibility for food, finance, recreation and maintenance of accounts etc.,
- Keep contact with the participants.
- Buildup news stories.

Limitations

- Because of limitations of funds and time study tours cannot be held frequently.
- Unpleasant experience may cause a setback.

Advantages of group contact methods

- Enables the extension agent to have face to face contact with a number of people at a time.
- Can reach a select part of the target group.
- Facilitates sharing of knowledge and experience and there by strengthen learning of the group members.
- Reach fewer people, but offer more opportunities for interaction and feedback.
- Satisfies the basic urge of people for social contacts.
- Motivate people to accept change due to group influence.
- More effective than mass method in stimulating action.
- Less expensive than individual method due to more coverage.

Group discussion

It is a form of discussion or dialogue between two or more people to exchange information of a common topic with an aim to understand and / or solve the problem.

Group discussion is a very significant method for extension work. It assumes that the members involved in discussion are equal in status and every participant has some experience or information to contribute. It is specially suited to work with adults who prefer sharing of information than being instructed. The members are free to question to each other.

Objectives

1. To exchange of experience and information.
2. To gain better understanding of a problem.
3. To find solution to a problem felt by the group.
4. To training people in leadership skills.
5. To plan a programme of action.

Technique

Planning

- Make arrangements for physical facilities viz. sitting place, furniture, public address system, drinking water etc.
- Inform everyone about time and place.
- Circulates materials needed for discussion.
- Arrange for someone to present the issue for discussion along with requisite background.
- Keep minimum visual aids like chart or chalk board for presenting important points.
- As farmer do not easily open up before expert, it is necessary to plan use of technique to help every member to share his point and feel a sense of belonging to the group.

Conducting

- Make group comfortable by exchanging greetings and general conversation.
- Seat the group in circle so that each one can see others.
- Motivate silent ones to come up.
- Discourage those who try to monopolies discussions.
- Clarify doubts or vague statements.
- Summaries group's views from time to time.
- Recognise and interpret different point of views present in the group.
- Analyse facts provided by the members.
- Encourage critical thinking among members by challenging the assumption and seeking evidences.
- Motivate members to take leading role one by one.

Role of Chairman

- Introduce members
- Announce the topic and purpose of discussion
- Listen to the contributions made by each member carefully.
- Build conductive climate to motivate members to speak freely.
- Keep discussion on moving track.
- Promote evaluation of all generalizations.
- Protect view points of minority.
- Get balanced participation.

- Promote group cohesion.
- Give summary.

Role of Members

- Members should talk one at a time and contribute only one point at a time.
- They should listen attentively and say on the subject.
- Members may ask critical questions whenever essential.
- They should try to promote group harmony.

Role of Experts

- In situations when the group does not have requisite technical information, expert may be called in.
- He should not suggest his own solution rather help the group understand the problem in their location and visualize possible solutions.

Advantages

- It is democratic method giving equal opportunity to each participant
- It create high degree of interest
- It helps people gain skills to work in teams
- It develops group morale
- It enhance knowledge and critical thinking

Limitations

- Villages may have factions and hence it may difficult to group discussion
- It is difficult to conduct discussion on new topic
- Requires understanding of group dynamics and skill of the extension agent
- A slow process and may not be suitable in crises and emergency situations

Group discussion techniques

1. Lecture: The lecture method is most suited to the literate population. But it can be adapted to all types of audience. It is used to present authoritative information to a large audience in the shortest time. A wide range of subjects can be covered using the lecture method. The speaker makes a presentation on the topic allotted to him for a definite period of time. Its weakness is that people are not likely to master as much of the information as the

speaker is likely to assume; because for the most part it is a one way communication. Members of audience listen in terms of their interest and remember in terms of their motivation and memory. It is the cheap method and the results are easy to check.

2. Debate: On a controversial subject two teams of usually 2 to 3 persons present their point of view. Each speaker has time allotted for speech to make his main speech and defense after the main speeches have been completed. In this case, there is two way communication between the debaters, but one way communication for the audience. The range of subjects for the debate is limited to controversial topics. The big advantage in a debate is that more than one side of a question is presented. There is however, one danger. If it is a decision debate there is the temptation for the debate to become highly antagonistic. In such a case, the motive to win the debate by means may lead to distortion of information, ignoring the primary need to inform the audience. This objection to the debate is overcome by holding non- decision debates or by having a forum after the debate.

3. Workshop: Workshop is a special type of working conference of a week or more duration. In workshop emphasis is given on lecture, individual conference and working in group. Under the guidance of the consultants work sessions the individual participant can work on a special problem either individually or as a member of group. This method is used for professional improvement and in- service training. The main item of the workshop are lectures by staff members, group meeting with selected groups, individual consultation and study, informal discussion on problems, arranging inspirational or special events and providing library and other resources for the study.

4. Seminar: It is one of the most important forms of group discussion. The discussion leader introduces the topic to be discussed. Members of the audience discuss the subject to which ready answer are not available. A seminar may have two or more plenary sessions. This method has the advantage of pooling together the opinions of a large number of persons.

5. Forum: It is a discussion period that may follow any one of the above methods of presentation. It consists of a question period in which members of the audience may ask questions or make brief statements. The forum provides an opportunity for the audience to clear up ambiguous points and to raise questions for additional information. It is also gives individuals an opportunity to state briefly their understanding of a point and see whether they

have interpreted correctly the material presented. It is primarily a means of understanding information.

6. Conference: Pooling of experiences and opinion among a group of people who have special qualifications in an area. The conference method mainly consists of small and large group discussion, steering committee and open plenary session. The conference help in clarifying various issues involved in a particular area as different points of view are expressed by experts in the conference.

7. Symposium: This is a short series of lectures; usually by 2 to 5 speakers. Each one speaks for a definite amount of time, and presents different phases or subdivisions of a general topic. The topic should be large enough or general enough to permit two or more subdivisions that are sufficiently significant to justify separate discussion by speakers. The subject may or may not be controversial. It is important that the speakers are of approximately equal ability, to avoid one speaker dominating the meeting or giving the audience a distorted view of the subject. The symposium is used primarily for information gathering, at the professional level. The advantage of symposium over a lecture is that two or more experts present different facts of the topic.

8. Panel: It is an informal conversation put on for the benefit of the audience, by a small group of speakers, usually from 2 to 8 in numbers. They are selected on the basis of the information and experiences they have. Members are seated so that they can see one another and face the audience. The panel is generally rehearsed before it is presented to the public. The leader introduces the members of the panel to the audience and announces the topic. He has the responsibility to see that the conversation keeps going, by asking questions or making brief comments, and encouraging the less talkative members. The special advantage of panel is that a spontaneous conversation about some subject may have more interest for the audience than a lecture.

9. Brain Storming: It is a creativity of generating ideas to solve a problem. It is the unstructured generation of idea by a group of people. The group is selected for their creativity and knowledge to seek solutions to particular problem or simply find better ways of meeting project objectives. Suggestions are encouraged and follow during a creativity session and everything is acceptable. From this, many ideas, some entirely new are brought forward for

analysis and ranking. Brainstorming is less structured than problem solving meetings. It seeks to generate entirely new ideas. People get involved and make positive contributions. It is good for team building and working together. It requires good facilitator to conduct the brain storming session.

10. Role play is defined as an experience around a specific situation which contains two or more different viewpoints or perspectives. The situation is usually written as a prepared brief and the different perspectives on the same situation are handed out to the different people who will come together to discuss the situation. Each person will have a particular objective, or objectives they want to fulfill which may well be in conflict with their fellow role player or role players. It is how each role player handles the situation that forms the basis of skills practice, assessment and development. The situations will be realistic and relevant to the role players and the most successful ones will be focused on developing a particular skill or skill set. If you consider a musical analogy, each 'player' is involved in the same 'symphony' but has a different score - their perspective and objective(s) - for their own 'instrument' - themselves as individuals - their histories.

11. Buzz session: Also known as Phillips 66 format or hurdle system. With large group when there is limited time for discussion, the audience may be divided into smaller unites for a short period. Groups of 6 to 8 persons get together after receiving instructions to discuss about a specific issue assigned. The secretary of each small group will report the findings or questions to the entire audience when they are reassembled. This technique can be successfully used for defining or clarifying the problem. It can help in developing a list of possible goals, standards, and activities for the consideration of the total group. It also helps in refining ideas and developing solutions to the problems.

LECTURE –7

Mass contact methods – Campaign, Exhibition, Farmers Day, Field trips, Radio, Television

Farm publications – Circular letter, Leaflet, Folder, Pamphlet, Newsletter, Newspaper

Mass Contact Methods

In this method the extension agent communicates with a vast and heterogeneous mass of people, without taking into consideration their individual or group identity. Normally group boundary gets obliterated. This method is valid when a large and widely dispersed audience is to be communicated within a short time. There may be a few communicators such as the extension agent and some subject matter specialists. The size of the audience may be a few 100s in mass meeting, few 1000s in campaign and a few lakhs in newspaper, radio and television. A few examples of mass methods are campaign, exhibition and mass meeting.

Advantages of mass contact method are

a. It is suitable for creating general awareness among the people.
b. It helps in transferring knowledge on farming and changing opinions.
c. Large number of people is communicated within a short span of time.
d. Facilitates quick communication in times of emergency.
e. Less extensive due to more coverage.

Few limitations in mass contact methods are

a. It is less intensive method.
b. Little scope for personal contact with the audience.
c. Generalized recommendations hinder application by individuals.
d. Little control over the responses of the audience and
e. Difficulty in getting feedback information and evaluation of results.

Mass Methods

Campaign

A campaign is an intense educational activity for motivating and mobilizing community to action, to solve a problem or satisfy a need urgently felt by it.

Objectives

✓ To create mass awareness about an important problem and encourage them to solve it.

✓ To induce emotional participation of the community at the local level and create a favorable psychological climate for adoption of new practices.

Technique

- Identify an important problem/ need of the community.
- List out the specialists could be involved in solving it.
- Decide about the time and duration of the campaign.
- Arrange necessary inputs, services and transport.
- Prepare a written programme.
- Give wide publicity.
- Carry out the campaign as per programme.
- Arrange method demonstration and training programme where needed.
- Maintain supply of critical inputs and services.
- Arrange mass media coverage.
- Conclude the campaign in time.
- Contact participants and find out their reactions.
- Assess the extent of adoption of the practice.
- Publicize successful campaigns
- Analyze deficiencies and failures
- Give due recognition to the local leaders.

Limitations

- Applicable only for topics of community interest.
- Success depends on co- operation of the community and their leaders.
- Unsuitable for practices involving complicated technicalities.
- Requires adequate preparation concerted efforts and propaganda techniques uninterrupted supply of critical inputs.

Exhibition

An exhibition is a systematic display of models, specimens, charts, photographs, pictures, posters, information etc., in a sequence around a theme to create awareness and interest in the community.

Objectives

- To acquaint people with the better standards.
- To create interest in a wide range of people.
- To motivate people to adopt better practices.

Technique

- Form a committee with the specialists, local leaders and administrations.
- Prepare a budget estimate and procure funds.
- Decide on the venue, time and duration.
- Prepare a written programme and communicate to all concerned in time.
- Get the site ready within the scheduled date.
- Earmark a stall for display of exhibits brought by farmers.
- Display posters at important places and give publicity through mass media.
- Decorate the stalls simply and tastefully. Make adequate arrangements for lighting.
- Prepare good quality and colourful exhibits and label them in local language.
- Display exhibits about 50-60 cm up-to a height of about 2 meters.
- For long duration exhibition arrange rotation and replacement of personnel.
- Organize formal opening.
- Arrange smooth flow of visitors.
- Let the interpreters briefly explain the exhibits to the visitors.
- Distribute publications during visit.
- Organize a panel of experts to discuss some problems.
- Arrange judging of exhibits and the premises clean.
- Conclude the exhibition as scheduled by thanking the participants.
- Maintain a visitor book for comments to get feed -back.
- Talk to the local leaders and assess success of the exhibition.
- Ensure availability of critical inputs and facilities emphasized during the exhibition.
- Look for changes in practice of the community in the coming years.

Mass Meeting

Mass meeting is held to communicate interesting and useful information to a large audience at a time. Mass meeting may be held in a covered or in an open place. Public address is essential for conducting mass meeting.

Objectives

1. To focus attention of the people on some important aspect.
2. To create general awareness about a programme.
3. To enlist people's participation in community work.
4. To appear personally before a large audience.

Technique

- Decide on the topic, occasion and the audience.
- Select a limited number of speakers and decide the venue, date and time with the local leaders.
- Complete all the arrangements in advance.
- Start the meeting in time.
- Use appropriate audio- visual aids.
- Watch reaction of the audience.
- Focus attention to the central theme.
- Close meeting in time.
- Give recognition to those actively participated.
- Keep contact with the interested persons.
- Sustain wider interest through mass media.

Limitations

- In-depth discussion of the topic not possible.
- Cannot be held frequently.
- Difficult to get feedback information.

Farmers Rally

It is a purposeful activity undertaken at an appropriate time for creating awareness and interest among the community in a concerted manner on a particular problem. For arranging the farmers rally following points should be considered.

Objectives

1. To create awareness about a problem and offer a solution.
2. To provide accurate information through experts to the participants.
3. To motivate people for the adoption of improved practices.

4. To provide opportunity for interaction among people in social gathering.

Technique

Planning and preparation

- Decide on the topic, venue and target audience.
- Select a limited number of experts.
- Decide with the local leader on the date and time and communicate the same to all the concerned well in advance.
- Prepare an agenda of the programme.
- Give wide publicity and put up posters at important points throughout the area.
- Use mass media to warm up the community.

Implementation

- Start the rally on the scheduled time and cut down the formalities to a minimum.
- Allow the experts to deliver the talk and after that keep the question answer session for clarification of doubts of the participants.
- Make the use of audio-visual aids.
- Arrange the mass media coverage.
- Conclude the rally in time.

Follow-up

- Contact the participants and find out their reactions.
- Assess the extent of adoption of the practice.
- Publicize the rally.
- Give due recognition to the local leaders.

Advantages

- It appeals to the practical type of individuals
- It create interest among the participants
- It motivate the people to adopt improved practice

Limitations

- It is costly
- Requires good deal of preparation and propaganda techniques
- Applicable for topics of community interest

LECTURE –8

Audio aids, Visual aids, Audio-Visual aids – Definitions, classification, Factors influencing selection and use of audio visual aids.

Audio – aids, Visual aids and Audio – Visual aids

Meaning and Definition

The term audio visual aid has a specific meaning. Literally, audio refers to sound waves that can normally be heard by the human ear. However, in the present context it implies relating to hearing. Similarly, the term visual implies relating to the sense of seeing. The expression "aids" implies those instructional devices or teaching aids which make teaching more effective.

Audio - aids are the instructional devices through which the message can only be heard.

Visual aids are the instructional devices through which the message can only be seen.

Audio – visual aids are the instructional devices through which the message can be heard and seen simultaneously. AV aids are used to communicate messages more effectively through sound and visuals.

Some definitions of audio visual aids as given by various authors are as follows

According to Kinder (1959), audio –visuals may be any device which can be used to make learning experience more concrete, more realistic and more dynamic.

Ahluwalia (1967) stated that these are those devices that transmit ideas and the experience through eyes and ears. They emphasize the use of non – verbal experiences in the learning process.

According to Hass and Packer (1964), an audio –visual aid is an instructional device that can be heard and seen.

Dale (1965) stated, all materials used in the classroom or other teaching situations to facilitate the understanding of the written or spoken words are audio visual aids.

Good's dictionary of education speaks of audio visual aids as, anything by means of which learning process may be encouraged or carried on through the sense of hearing or sense of sight. Dekieffer and Cochran (1966) define audio – visual aids as, those materials by the wise selection and use of which experience can be provided which will develop understanding and enhance thinking. According to Chakarbarti (1962) any materials used to reinforce the spoken word in teaching which contribute to better learning by students, can be termed as audio –visuals.

This way of classification of audio – visual aids is based on the principle that the people learn through their senses. The purpose of the process of communication is to enable the audience in bringing about increased 'perception' 'absorption' and retention of the messages initiated by the communicator. Understanding of the messages, according to the findings of different test varies as follows:

- 75% of all the messages perceived are absorbed by eye.
- 15% is absorbed by ear.
- And the rest is almost equally distributed among touch, taste, and smell.

But when we examine actual communication, we find that the channel of hearing is often overloaded, since we traditionally tend to believe that speech and discussions are the easiest ways of conveying a message, and the channel of 'sight' which is the strongest, is hardly used at all.

Functions of Audio Visual Aids

- Help the correct initial concept.
- Help learning more and speed learning process.
- Clarify and give definite meaning towards and thus combat verbalism.
- Arouse interest and attract attention.
- Build and sustain interest.
- Motivate, develop and change attitudes.
- Vitalize instruction and provide variety in teaching.
- Supplement other learning and serve as reminder.

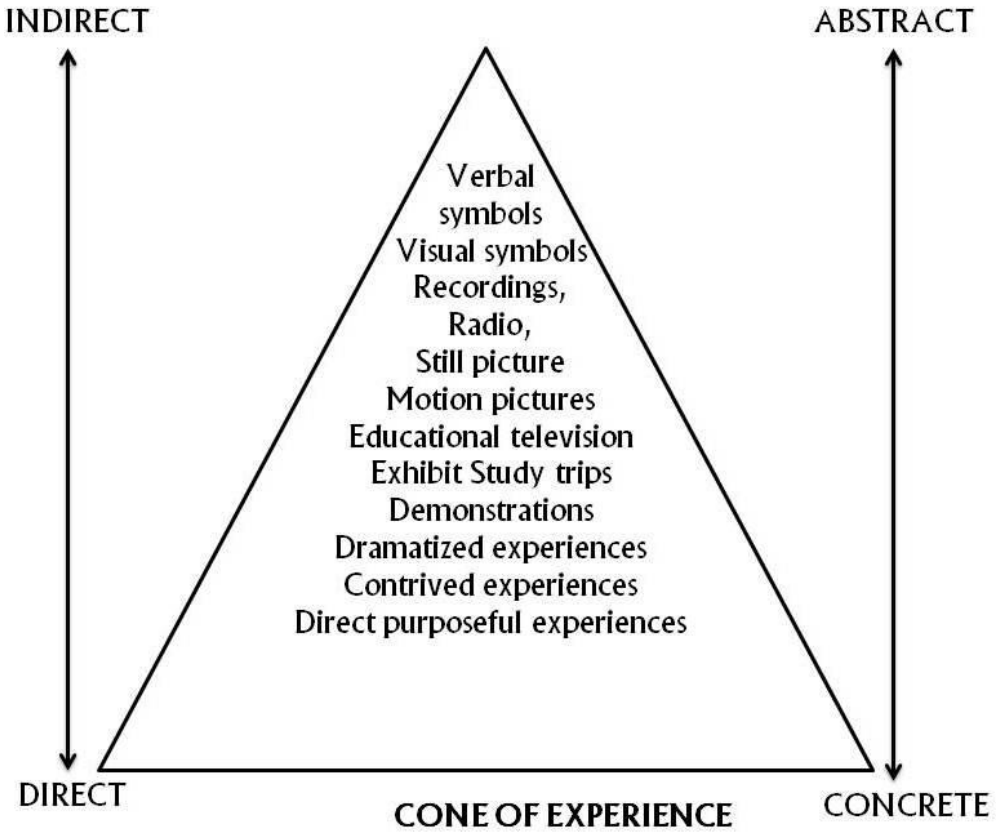
Choice of audio – visual aids

Av aids are used singly or in combination with other aids and extension methods. The choice of AV aids shall depend on a number of criteria.

1. Teaching objective
2. Nature of the subject matter
3. Nature of audience
4. Size of the audience
5. Availability of equipments, materials and funds
6. Skill and experience of the extension agent in preparation and use of AV aids.

Cone of experience

The base of the cone represents the teaching methods which have strongest long lasting impact on the audience. It provides them with an opportunity to involve maximum number of senses with a chance to do the things themselves. As we move to the top, the learning experience becomes more indirect and abstract with lesser degree of involvement of different senses.



Classification of Audio – Visual aids

The audio – visual aids may be classified into three categories as follows. This is traditional way of categorisation.

Audio aids	Visual aids	Audio visual aids
Tape recorder 1. Public address system 2. Telephone 3. Radio 4. Mobile phones	**Non projected** 1. Chalk board 2. Bulletin board 3. Picture and photograph 4. Flannel graph, flash card 5. Posters 6. Charts and graphs, diagram, map 7. Specimen, model, diorama 8. Translide **Projected** 1. Transparencies 2. Slides 3. Film strip 4. Opaque materials	**Non projected** 1. Drama 2. Puppet show 3. Talking doll **Projected** 1. Motion picture (cinema) 2. video

Another way of classifying the audio visual aids like display type, such as poster. Bulletin board, exhibits etc. and presentation type such as flash card, slides, film strip etc.

Display type visuals are those which are spread before the audience for viewing, who get the message by looking at them.

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.

Recent classification

Recent classification tends to categorize the AV aids into Hardware aids and software aids.

Hardware aids are the machines/ equipments used for imparting audio visual education. These may involve simple mechanism such as magic lantern, epidiascope, overhead projector or may be highly complex such as computer, multimedia, video etc.,

Software aids are the knowledge/ information aspect which helps in operating the system of hardware such as slides, transparencies, film strips.

Audio – Visual aids		
Hardware aids		**Software aids**
Simple	**Complex**	
1. Magic Lantern	1. Radio, TV	1. Slide
2. Epidiascope	2. Computer	2. Film Strips
3. Overhead projector	3. Tape recorder	3. Transparencies
4. Slide projector	4. Telephone	4. Charts
5. Film projector		5. Maps
6. LCD projector		6. CDs, DVDs, Pen Drive

Planning and selection of Audio – visual Aids

In Planning for the selection of visual and audio – visual aids, three points must be kept in mind:

a) Decide what you want to say why it is important to say it.

b) Outline the subject- matter point by point.

c) Visualize the key points in the outline. Make aids, or select them from commercially prepared ones.

The following points would help the extension worker to select appropriate AV aids

a) Select the best aid or combination of aids to meet the specific objective.

b) The aids should not be new to the learner's environment. The effective extension worker should make use of indigenous materials.

c) The aid should be appropriate to the age, intelligence, sex, education, experience etc.

d) The aid should not be too old or damaged.

e) Too many aids should not be used unnecessarily.

f) Simple aids, if equally effective, should be preferred to expensive aids. Effective aids need not necessarily be expensive.

g) An aid should help learners to make better thinkers and critical minded.

h) Selected aid should be worth the time, expense and efforts involved.

i) A teacher should know his own capabilities while making selection.

j) The nature of subject matter being taught.

k) The size of audience should also be considered while selecting the aids.

In making decisions about these matters, the following points should be kept in mind.

1. There is no best teaching aid: The situation determines which teaching aid to choose. An effective teacher recognizes the fact that there is no best teaching aid. He is also aware that with variety of visual and audio aids he is in a position to select the aid or aids that he feels are the best for the particular situation**.**

2. **The teaching objective:** What are the changes in behaviour to be brought about? One or all of the following will usually be involved: (a) learning a new skill or improving an old method, (b) gaining information and increasing knowledge, (c) changing attitude.

3. **The subject – matter to be taught:** A method demonstration for example, may be the best visual aid to use in teaching a person a particular skill, whereas a motion picture may be the most effective way to teach a group about people in another hand.

4. **The nature of the learner**

Consider the following:

- Age level of the learner
- Educational level of the learner
- Interest of the learner
- Experience of the learner
- Knowledge of the learner about of the subject
- Intelligence of the learner.

5. **Cost of the aid:** In addition to effectiveness the matter of practicability must be considered. Effective visual aids do not necessarily need to be expensive.

6. **The teacher:** The extension worker is the determining factor in the selection of visual and audio –visual aids. The following points influence his choice of aids.

a. Familiarity with and skill in using teaching aids.

b. Originality and skill in the selection, preparation and use of aids.

7. **Availability:** An effective extension worker makes use of indigenous materials when the teaching aid he would like to use is not available. There are many teaching aids available if one takes the trouble, time and interest to find them and adapt them to his needs.

From the view point of appealing to the audience and encouraging people to acquire knowledge, visual aids must

a. Please the senses…not offend.

b. Be accurate.

c. Represent things that are common and understandable.

d. Convey up- to- date ideas.

e. Fascinate, intrigue and encourage action.

f. Entice the viewer to eye your ideas, try your ideas and buy your ideas.

The effective use of Visual and Audio – visual aids

There are a number of points that, when taken into account, will help to improve the use of visual aids. Some of them are:

1. Plan well in advance of the time visual and audio- visual aids are to be used. Planning ahead helps to anticipate problems and avoid them.

2. Make sure the aids are suitable for the size of the audience. Even the person at the back of the room must be able to see. Go to back of the room and look at the visual aid to determine if it can be seen clearly.

3. Use a variety of colorful visual aids. They help to change the pace of the presentation and help to hold audience interest.

4. Prepare by rehearsing in order to make a smooth presentation.

5. A comfortable place with proper light, airy, attractive place is important to an effective learning situation. Make the place where the presentation is to be made as convenient and comfortable as possible.

6. Arrange your visual and audio- visual aids in sequence and place them where they can be reached conveniently.

7. Make sure that all aids are in good working order before the presentation is started.

8. Display only one aid at a time.

9. Present aid at the crucial moment.

10. Keep aids out of sight until ready for it.

11. Stand beside the aid, not in front of it.

12. Speak to the audience not to the aid.

13. Remove all unrelated material.

14. Avoid any misunderstanding by discussion and application.

15. Test for good illustrative material.

a. Will it help to achieve the purpose?
b. Will it give a true impression?
c. Will it stimulate imagination?
d. Will it add to the knowledge of the audience?
e. Will it focus attention on the main ideas?

Organization of an Audio –visual Programme

The following general procedure may be adopted in organizing an audio visual programme.

Planning

- Identity the objective.
- Plan for a simple, practical, educational and interesting presentation.
- Anticipate the size of the audience.
- Plan for a variety of colorful visual aids.

Preparation

- Collect relevant equipments and materials.
- Pre- view the audio-visual aids.
- Rehearse and make adequate preparation.
- Check power supply, lighting, need for total darkness, seating arrangements etc.
- Select and train the audio – visual operator or any other suitable person in the organization.
- Arrange the audio visual aids in a sequence and have them within easy reach.

Presentation

- Motivate the audience and stress on the key points.
- Present aids at the right moment and in proper sequence. Take precaution during presentation.
- Stand on one side of the material presented and speak facing the audience.

Follow – up

- Observe reaction of the audience.
- Clarify doubts and dispel misunderstanding, if any.
- Improve subsequent presentations by deleting irrelevant and old materials and adding something new, if required.

Limitations

- Because of cultural difference, the audience may form a mistaken or distorted impression about the audio – visual aids.
- Teaching may be scratchy instead of being complete.
- Over – reliance on audio –visual aids may convert teaching to showmanship.

For fool –proof and effective presentation, pretesting and/ or preview of audio –visual aids is a must. Proper storage and maintenance of audio – visual aids are important. To facilitate running of audio – visual aids on electricity, a standby portable generator, a multiple switch –board with a long flexible cord for power supply and a voltage stabilizer may be procured. For Projected visuals, a roll – back screen and a folding table may be kept ready at hand.

Advantages of Audio Visual aids

Research has shown that audio visual aids help to

1. Reduce verbalism.
2. Make learning permanent.
3. Clarify ideas being presented.
4. Capture audience attention, arouse their interest and involvement.
5. Vitalize and make teaching more real.
6. Overcome the language barrier.
7. Stimulate thinking and motivate action.
8. Provide experiences otherwise difficult to get.
9. Help to reach more people irrespective of their level of literacy and language.
10. Speed up the process of learning.
11. Save time of teacher and learner because they make learning easier and faster.
12. Can adapt the speed of presentation to the reactions of the audience.
13. Highlight main points of the message clearly.
14. The possibility of misinterpreting concepts is reduced.
15. Structure the learning process more effectively.
16. Messages perceived with several senses are understood and retained better.

Disadvantages/ Limitations

1. Learner may sometimes form distorted impressions, unless audio –visual are supplemented with required explanation.
2. Temptation for the teacher to narrow down his teaching to only a few big ideas, not giving the complete picture of a subject.
3. Some teachers acquire the mistaken idea that they have little to do when audio – visuals are used.
4. Over – reliance on audio visual aids may convert teaching to showmanship.
5. Because of cultural difference, the audience may form a mistake or distorted impression about the audio visual aids.
6. Teaching may be scratchy instead of being complete.

AUDIO AIDS

1. Tape Recorder

The tape recorder is audio equipment which helps us to record the sound in a magnetic tape and reproduces it when it is required. The operational principles of tape recorder and their use in extension teaching are discussed here.

Different Parts of a Tape Recorder

A tape recorder consists of different parts such as volume control, speaker, a recording and play back head, pinch wheel, drive capstan, tape controls such as play, forward, rewind, stop and record and a cassette holder with motor driven spindles.

Controls

The sound controls in all tape recorders are used for adjusting the sound output. The power control such as power on, off switch is used to connect the tape recorder with power source. The recording level indicator indicates the sound quality recorded in the tape.

Recording and Play Back Units

The recording and play back heads magnetic the tapes to record the send as magnetic waves and to reproduce the magnetic waves into electrical waves. The erase head clears the previously recorded material in the tape. The drive capstan helps forward motion to the tape for playing and recording when the tape is pushed against it by the pinch wheel.

Tape Travel Control Units

The control units for tape travel in a tape recorder are fast forward, rewind, play, record, pause and stop. The fast forward control helps to play the tape at a faster speed than the play speed. This helps us to skip the program and go forward. Rewind control helps us to rewind the tape. The pause control when pressed stops the tape travel. The record control helps to record the programme. Through play control we can operate the tape recorder for the programme reproduction and the index counter helps us to locate various programme segments on the tape.

Operational Principles

The tape recorder operates on the principle of converting Sound waves into magnetic waves recorded on the tape. While reproducing the sound, the magnetic waves recorded in the

tape are converted into electrical waves, which are amplified and then give the sound output through the speakers.

Magnetic Tapes

The tape is a recording device wherein magnetic fields are set up in the metallic coating on the tape. When the tape is played, this magnetic field generates electrical impulses in the machine which are amplified and reproduced as sound. A tape can be replayed as many times without any audible change in the sound quality. A programme on the tape can be completely removed and replaced with a new programme. Normally, the tape is coated with thin layer of chromed. For ultra high performance, tapes with special coating such as chromium oxide are also used. The tape is normally supplied on reels of several sizes kept inside a cassette or a cartridge.

Advantages of Tape Recorder

1) Simple to operate.
2) We can record programmes of our choice and reproduce them whenever necessary.
3) Cost is very low and widely available.
4) Less storage space is needed for the tapes.
5) Portable, we can carry easily to all the places.
6) Prerecorded lesions can be made available to the farmers.

Limitations

1) One way communication. Limited interaction is possible with the learner.
2) Not suitable for all types of programmes.

2. Public Address System (PAS)

The public address system helps the extension worker to address a large size of audience. The public address system includes a microphone, amplifier and a speaker. The microphone receives the sound and converts it into electrical waves and transmits to amplifier. In the amplifier the electrical waves are amplified and then passed n to loudspeaker where the amplified electrical waves are converted into sound waves. Through the volume control we can reduce or increase the volume of sound output from the loudspeaker.

How to operate a public address system?

The general operating mechanism of the public address system is given below.

1. To start with, collect the' details of audience size, nature of the place where the PAS is used, number of microphones and output speakers required to meet the requirement.

2. Select the right places to keep the amplifier and controlling units so that the audience will not be disturbed by its presence.

3. Fix the microphone on the stand and keep it at the place where it is needed.

4. From the microphone output connect the lead and bring it to the amplifier for connecting it with the input terminal of the amplifier.

5. Connect the loudspeakers to the output terminals of the amplifier.

6. Connect the amplifier to the power supply.

7. Switch on the amplifier and look for the pilot lamp glow as an indication of power supply to the amplifier.

8. Keep the volume control to the minimum and slightly increase the volume control to get the typical GING sound produced. When more than one microphone is connected to amplifier, volume control for each microphone is to be checked for its function.

9. To test the microphone, switch on the MIC switch and speak words like MIC test 1, 2, 3; or Hello, Hello. Blowing of air and knocking on the microphone should be avoided.

10. Adjust the microphone level according to the height of the speaker and keep the microphone at a distance of 30-25 cm from the speaker. A minimum of one foot distance is necessary for sound clarity. Moving too closer to and away from the microphone should be avoided.

11. Once the microphone is tested for sound pickup slightly advance the volume control and adjust the tone for the desired level of sound output.

12. For recording of the sound use separate microphone output and pickup lead attached to the tape recorder which records the microphone output.

13. On completing the work turn off the volume control, switch off the power supply, disconnect the set and keep them in their respective cases.

Advantages

1) Helps to minimize the efforts of the communicator and relieves from the stress of talking loudly.
2) A huge size of audience can be covered easily.
3) Increases the listening capacity of the audience.
4) Easy to operate and transport from place to place.
5) Where there is no power supply, it can be operated with the battery.

3. Telephone

Telephone provides for instant interpersonal communication at high speed and at considerable saving of time, money and labor. Use of mobile telephones has spread rapidly even in the rural areas and may be considered as a necessity rather than a luxury. A cell phone offers full Duplex Communication and transfer the link when the user moves from one cell to another. As the phone user moves from one cell area to another, the system automatically commands the mobile phone and a cell site with a stronger signal, to switch on to a new frequency in order to keep the link.

Mobile phone is primarily designed for Voice communication. In addition to the standard voice function, new generation mobile phones support many additional services, and accessories, such as SMS for text messaging, email, packet switching for access to the Internet, gaming, Bluetooth, camera with video recorder and MMS for sending and receiving photos and video, MP3 player, radio and GPS.

Mobile Technology

- Internet and Wi Fi
- Touch screen
- Games and quizzes

- Mobile applications
- Any time & anywhere

The value of mobile learning

- It is important to bring new technology into the classroom.
- Devices used are more lightweight than books and PCs.
- Mobile learning can be used to diversify the types of learning activities students (or a blended learning approach).
- 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. However, for SMS and MMS this might be dependent on the students' specific disabilities or difficulties involved.
- Mobile learning can be used as a 'hook' to re-engage disaffected youth.

Benefits

- 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
- Decrease in training costs
- Potentially a more rewarding learning experience

NON-PROJECTED VISUAL AIDS

Meaning-Importance

The non-projected visuals like black board, picture, posters, charts, flash cards, flip books, flip charts, flannel graphs, picture strips, exhibits hoardings, etc do not require any equipment, like a projector, for their display. These aids are very easy to make, easy to carry and can be made with locally available inexpensive material.

The non-projected aids and be divided into:

a. Teaching aids

b. Display type.

a. Teaching aids: The teaching aids which are non-projected visuals and can be prepared and used by teachers or extension workers are: (1) Chalk board, (2) Pictures including photographs and hand drawn pictures, (3) Flash cards, (4) Flib books-similar to a set of flash cards but bound at the top in the form of a calendar, (5) Flip charts—few charts on a particular theme put together and bound together at the top, and (6) Flannel graph.

b. Display visuals: These include posters, hoardings, charts and exhibits. Once they are displayed they stand on their legs and convey the message to whosoever sees them. There is no necessity for anyone to stand by their side and explain.

Importance of Non-Projected Aids

i. Can be made with locally available inexpensive material.
ii. Capture audience attention and arouse their interest.
iii. Highlight main points of the message clearly.
iv. The possibility of misinterpreting concepts is reduced.
v. Structure the learning process more effectively.
vi. Messages perceived with several senses are understood and retained better.
vii. Provide experiences otherwise difficult to get.
viii. Help reach more people irrespective of their level of literacy and language.
ix. Speed up the process of learning.
x. Can adapt the speed of presentation to the reactions of the audience.
xi. Save time of teacher and learner.

1. Chalk board / Black board

A blackboard or chalkboard is a reusable writing surface on which text or drawings are made with sticks of calcium sulfate. These sticks are known as chalk. Chalkboards were originally made of smooth, thin sheets of black or dark grey slate stone. Modern versions are often green or brown and are thus sometimes called a green board or brown board instead.

Advantages and disadvantages

It is easier to write legibly and draw accurately on a chalkboard than on a whiteboard because whiteboards are slippery and blackboards are not.

Chalkboards have disadvantages relative to whiteboards: they produce dust, the amount depending on the quality of chalk used. Some people find this uncomfortable or may be allergic to it, and there has been speculation about links between chalk dust and respiratory problems. The dust also precludes the use of chalk in areas shared with dust-sensitive equipment such as computers.

The scratching of fingernails on a chalkboard, as well as other pointed, especially metal objects against chalkboards produces a sound that is well-known for being extremely irritating. Many are averse also to merely the sight or thought of this sort of contact.

2. Bulletin Board

A bulletin board is used to deliver the message and produce action. Photographs, publications, drawings, posters, wall newspapers, leaflets, specimen cuttings, cutout figures and illustrations are some of the items that are generally displayed on a bulletin board. It is a simple and, inexpensive process in extension education. A bulletin board can be used in indoor as well as outdoor communication and teaching learning process. The flannel board is different from the bulletin board in the sense that bulletin board is made of a soft board or a khadi cloth or coconut matting and the displays are pined or tagged on it. In the case of felt or flannel board, the material is different and the displays are made to stick on them. The bulletin board should not be crowded by displaying more number of materials on it. Displaying more number of information, ideas and innovations at a time on a bulletin board leads to confusion and finally no message will be communicated.

A good bulletin board is a basic, vital and animated aid to arouse the learners' interest, develop efficiency and to follow up blackboard work and other teaching aids. Proper use of bulletin board is necessary and it is an art that every extension worker must know and practice it to perfection. Some of the basic tips for make use of the bulletin board are as follows:

1) Do not place conglomeration of various materials which will badly affect the communication process.

2) Select suitably display materials based on the subject matter to be discussed.

3) The material selected for the display should be clear and should evoke interest.

4) The title and captions should be brief and self explanatory.

5) Select suitable colors to attain a color harmony.

6) Prepare visual layout models, different arrangement of visual materials and invite opinion for selecting the best visual design.

7) Exhibit the bulletin board at the appropriate place for inviting every ones attention. It should be placed at least three feet above the floor level.

Items to be displayed on a Bulletin board

The visual materials that can be displayed on a bulletin board are very many. Some of the common materials that are displayed on a bulletin board are given below

1. Pictures
2. Photographs
3. Drawings
4. Diagrams
5. Graphs
6. Charts
7. Notices
8. Pamphlets
9. Maps
10. Cartoons
11. News items and articles
12. Brochures, leaflets etc.
13. Timetable, announcement
14. Calendars
15. Illustration and figures
16. Tables
17. Circulars and letters
18. Schedules and program details
19. Models and specimens
20. Any other materials of interest.

How to make a Bulletin Board?

A wide range aesthetically designed bulletin boards are available in the market. Bulletin boards fitted with glass slide doors and wire net doors are available in the market. A protective door will help to keep the visuals safe. The extension workers can make their own

bulletin boards according to their choice and likings. The materials required to make a bulletin board are locally available and it is ones' own creativity to select such materials and make use of them. The size of the bulletin board depends upon the requirements. The bulletin board should be simple to display the information on it.

Bulletin boards can be made of softwood covered with cloth, cork, cardboards, plywood covered with burlap or monk's cloth, coir board, heavy brown wrapping paper and other types of boards made of synthetic and natural fibers. The background should be colored with suitable neutral colors. The billiard or velvet cloth gives an aesthetic appeal if it is stretched over a soft wood backing and used as bulletin board. The bulletin boards shall either fix on the wall or shall be attached to an easel or a wooden frame for portable purpose to be used in different teaching learning situation.

Use of Bulletin Boards in extension teaching

The advantage of the bulletin board is that the extension worker can make use of it under a variety of circumstances. The bulletin board can be used for reviewing the subject matter and other illustrations presented in the class room. The visual materials such as flash cards, pictures, charts and diagrams can be suitably displayed on the bulletin board so that the subject matter can be reviewed by the learners after their class or training sessions are over. Similarly, the subject matters that are discussed through slides, transparencies and motion pictures can also be suitably represented to the learners through displaying suitable visual materials on the bulletin board.

In addition, the bulletin boards also can be used for outdoor display of the materials informing about a new innovation, details about training session and other news items to be disseminated. Interesting and suitable titles, captions, pictures, magazine cuttings, posters shall be displayed over the bulletin boards to get the attention and arouse the interest: By just mentioning the name of a farmer who has done some commendable work on the bulletin board will be sufficient to arouse their interest. The bulletin boards therefore can be used as a tool of reinforcement to the learner.

DO's for using the Bulletin Board

1) Do the display in an orderly manner without making a conglomeration by over packing with visuals.

2) Do decide the layout of the visual display according to the subject matter and type of the materials to be displayed.

3) Do keep the bulletin board at the right place to make it accessible and visible to persons of all height.

4) Do tell single story at a time and arrange he visual material in an orderly and interesting manner.

5) Do display titles and captions to attract the individuals.

6) Do use attractive colors in a harmonious way.

7) Do change the display items once the purpose is served. Do make the bulletin board according to your purpose and taste.

8) Do place them at a suitable place and elevation so that everyone could have an easy look at it.

3. Pictures and Photographs

Pictures

In extension teaching the pictures are used to focus the attention, arouse interest, introduce a new technology or innovation and illustrate or explain a thing which is otherwise difficult to understand for the learner. Pictures provide a real world experience to the viewers. They give liveliness to the teaching learning process. For example, to tell about the shape of a silo pit, a picture of silo shown to the audience well conveys the message more meaningfully than a lecture. In picture, the people can see, how a new farm implement look like and its parts. They can see the exact symptoms that appear during various diseases. The pictures can be used in various types of teaching learning situation and they help the teacher to minimize his efforts in explaining a thing and a learner to get an idea and understand the message easily. The pictures help to overcome the language barriers. The pictures are universal and involve emotion as well as arouse the interest.

How to select the right picture?

Selecting a right picture is a must for the proper use of pictures in the extension teaching process. The following are some of the points to be kept in mind for selecting the pictures:

The picture should

1. Suit well to the subject matter under discussion.
2. Be of good quality.
3. Be interesting, accurate and well produced in terms of every detail.
4. Arouse interest and hold the attention.
5. Rise appropriate question in the mind of viewer.
6. Be of appropriate size suitable to the purpose.
7. Make the abstraction into real.

Use of Pictures

1. The pictures stimulate creativity.
2. Make the abstraction into concrete and real.
3. Improves the visual and verbal literacy.
4. Stimulate the interest.
5. Helps to understand and remember things.
6. Pictures overcome the language barriers.

How to use pictures in Extension teaching?

Any picture worth using is worth mounting. Mounting of picture is necessary (1) to protect it, (2) to make it more attractive and (3) to increase its effectiveness. The first and foremost thing for the effective use of pictures in extension teaching is to select the right and meaningful picture suitable for the subject matter. The pictures should be shown in the appropriate place during the lecture. The pictures shall be used in a varied number of ways. Display the pictures in the appropriate places to get every body's' attention. After getting the attention, the picture shall be passed on td everyone to have a detailed look. Ask appropriate questions so that they can look into the picture in search of the answers. The pictures shall be projected with the help of an opaque projector and the details shall be explained. The pictures should be properly arranged in a filing cabinet or in an album for easy display or handling and

to protect them from getting damaged. Some of the pictures need to be used frequently and kept for display. Such pictures are to be mounted properly to make them more attractive and effective. Here are some guidelines to mount the pictures:

1. Mounting type

The pictures shall be mounted on thin cardboard sheets. Illustration board, card and chart paper form a good mount for the picture. Now days the synthetic picture mounts are available.

2. Color

The color of the mount is important to make the picture more attractive and effective. Neutral colors such as gray, white can be used with many pictures. For a matching visual effect the color of the mount should blend with the prominent color in the picture.

3. Size

The size of the mount always depends upon the picture size. Too large a mount will not add aesthetic sense to the picture. The size of the picture and the mount should be proportionate to each other in the sense that it should give an aesthetic look. Mostly, a picture size of the range 8 by 10 inch or 9 by 11 inch or a post card size pictures are used in the extension teaching process. A mount size of 3 by 5 inches is suitable for small pictures, 7 1/4 by 4 1/4 inches for the intermediary size and 10 by 12 inches for larger pictures.

4. Fixing or Mounting

Picture on its mount, suitable fixing materials such as paste, glue, rubber cement adhesive tape, synthetic adhesives etc. can be used. Care should be taken to prevent the adhesives spreading all over the sheet. After fixing the picture, press the picture by keeping them under some weight uniformly spread over the picture so as to prevent them from curling. Rounding the corners of the picture helps to preserve the appearance.

5. Labeling

After the pictures are mounting, the pictures should be given suitable title as caption which should be self explanatory for those who view the pictures. In addition, labeling the pictures also helps for easy classification to keep them under the respective subject files.

6. Laminated pictures

Lamination is the process by which a thin layer of transparent sheet is spread over the picture by heat process. The lamination helps to preserve the picture for a long time. It prevents the picture from picking up dirt and becoming greasy after repeated handling. It also protects the picture from accidental tearing as it gives extra protection to the picture.

Protection of the mounted pictures shall be done by means of covering the picture with plastic spray lamination and sealing them under a polythene pack. All the four corners of the mounted pictures shall be then rounded by using special tools. The round corners help to reduce 'the chances of damage.

Filing of Pictures

Proper filing of pictures is important for storing and retrieval of the pictures. Suitable filing cabinets shall be used to file the pictures; the pictures shall be classified on the basis of their subject matter and titles. The classified pictures are then organized into different units for easy maintenance and retrieval. It is always advisable to maintain additional copies for important pictures to compensate their loss.

Photographs

The word photography means writing with, light. Photographs provide an opportunity to capture those important life events for future day references. Memories fade away; photograph lasts to rekindle our memory. The photographs pay an important role in the extension teaching. The photographs depicting the new agricultural machines, the outcome of an experiment, insects and flies that are responsible for the diseases etc., will help in a large way to communicate effectively with the farmers. The photograph provides the direct evidence about a fact to the learner. The photographs can be easily prepared by using locally available facilities and materials. Photographs give us an opportunity to communicate with learner's inspire of language difference. The photographs speak a universal language, attract attention and arouse interest. They can be effectively used by arranging them in a sequence to build a story. They can be used to show the various steps involved in adopting an improved practice to show accurate details, to bring emotion and action and to convince the farmer with before and after result. It is important for an extension worker to have the basic knowledge about the photographs, photographic equipments and techniques.

Colour Still Photographs

An object appears coloured if it preferentially absorbs some of the light rays falling upon it. The present practice of colour photography is that of dichromatic or subjective colour reproduction. The papers for making colour prints are mainly of two types: Positive and reversal. The positive colour papers are intended for making colour prints from colour negative and the reversal color papers yield a positive color prints from a positive transparency and require reversal processing. The colour still photographs are very much useful in the extension education as it helps to present the details of a thing in a most natural way which attracts the audience interest. Color still photographs are more advantageous than the pictures as the former is more attractive, natural and realistic. Naturally a colour still photograph of a crossbred can appear more meaningful than the picture of the cow drawn by an artist. The richness of the message is preserved in the color still photographs than the printed pictures.

Uses of colour still photographs

1. Improves the teaching learning process.
2. Attracts the viewer's attention.
3. Conveys the meaning more accurately and attractively.
4. Can be preserved for long time.
5. Easy to handle and use.
6. Flexibility in using; can be used for any situation, i.e. both indoor and outdoor.
7. Best suitable for small group teaching.
8. Low cost and easy to prepare.
9. Does not require any electronic equipments or preparation before for presentation.
10. Replacement is easier.

Camera types

There are so many varieties of cameras available in the market. Some of the basic types of cameras particularly important to extension are

1) Instant loading camera.

- These cameras need minimum adjustment for taking pictures.
- They are autofocus. The focal length of the lens is fixed.

2) Compact 35 mm camera

These cameras have automatic exposure control with option for shutter speed or aperture adjustment. They are fitted with optical view finders and do not accept interchangeable lens. The lens are of wider angle type i.e. slightly shorter than the normal lens fitted in other type of 35 mm cameras. The wide angle lenses are specially suited for shooting from the hip to get candid and documentary photographs.

3) 35 mm - Reflex camera

The 35 mm single lens reflex camera system (S.L.R. type) offers maximum flexibility in its operation. It permits to use variety of lenses and accurate framing of the object is possible.

4) Instantaneous color picture camera

With this camera through its instantaneous color picture production process, the final photographic print is obtained immediately after the exposure. No negative is produced with this camera. Even though the price of this camera is not expensive, the cost per exposure rate for films used in them is higher than that of those used for conventional cameras.

Other type of still cameras include Polaroid camera, single and twin reflex cameras, view cameras, press cameras, half frame 35 mm and subminiature cameras.

5) Photographic film

The films used for taking photographs also differ in features such as black and white, color, size, speed, color sensitivity, contrast and grain. Some of these features of the film are explained here.

i) Black and white negative film

These films on developing will give black and white pictures. They do not take up the colors from the objects exposed to them. They are available in variable speed.

ii) Color negative film

Color negative films are used to take color photographs. These films take up colors from the objects when the eyes are exposed. The color films are available in various speeds.

iii) Positive films

Unlike the negative films, on processing these films can be used as slides and can be projected through a slide projector. Positive films are used to make color transparencies and slides.

iv) Film speed

The film speed determines the exposure time of the film to the light. Different films need different amounts of light for proper exposure. This character of the film is expressed as film speed and given an ASA (American Standards Association) or DIN (Deutsche industries Norm) unit. The film speed caries from 25 ASA (slow) to 400 ASA (fast). The choice of the film depends upon the purpose for which they are selected. For example, a film speed of 200 ASA is normally used to make photographs with a hand held camera in an artificially lighted (through flash) room condition. For bright light use, fast films require extremely short exposure through small apertures. The rate at which a film is exposed should match with the ASA rating of the film. To take photographs of fast moving object, the faster film (high ASA rating) are helpful. For faster films the exposure time required is lesser than that of slow speed films. For example, an ASA 200 film requires 1/8th of the exposure that is required for an ASA 25 film. The exposure is adjusted through either by the size of the lens opening or by the length of the exposure time.

Aperture size and shutter speed

It is the size of the lens diaphragm opening that controls the amount of light that passes through the lens during the exposure. The aperture sizes are expressed in f/numbers. The various aperture setting is ff22, f/16, f/1, f/8, f/5 and so on smaller the number larger the aperture opening size the f/numbers and the aperture size are in indirect proportion. The f/11 opening is half as large as the next level f/8. The length of time of exposure is controlled by setting the shutter speed of the camera. The shutter speeds are stated as fractions of seconds such as 1/15, 1/30, 1/60, 1/120 and so on.

Camera Lenses

The camera is fitted with a lens of normal focal length. In some of the cameras, the normal lens can be removed and lenses of other focal lengths can be fitted to provide wide angle, telephoto or close up effects. The focal length of the lens determines the size at which images are reproduced on the film. Usually the focal length of a lens is embossed on its

cashing. The focal length of a lens is expressed in millimeters (50 mm, 35 mm, 90 mm etc). Zoom lens is used to take pictures of distant objects. With the help of the zoom lens the object size and the width of the field can be adjusted by just remaining in one position. The wide angle lenses are useful in interior scenes where space is limited. The telephoto lens produces image size larger than image produced by normal lens.

Zoom Lenses for Still Cameras

It is the lens of variable focal length which can be adjusted continuously by the movement of one or more groups of elements in the -lens system. Zoom lenses were originally developed for motion picture and television cameras. Zoom lenses are also available for still cameras and projectors and in all cases have the advantage of providing a continuous range of focal lengths without the need for changing the lens on the camera.

Field Depth

When you are focusing an object some areas in front and behind the object are also focused. This range of focus is called as field depth. The picture sharpness is determined by the field depth. Field depth can be defined as the distance between points nearest to and furthest from the camera that is still acceptably sharp in the picture. The field depth varies with the aperture used. With a large lens opening (f/11) the depth of the field is much less than with a very small opening (f/22). Therefore, the aperture control helps us to control the sharpness of focus of objects according to their distance from the camera. The thumb rule is smaller the aperture, wider the field depth and vice versa. Shorter focal length lens gives greater field depth when shooting distance is more than greater the field depth.

Shooting Pictures

The basic steps suggested for taking a photograph are listed below.

1) Study the camera and its operational procedure through the instruction manual supplied along with the camera.

2) Make you acquainted with the camera controls, proper method of loading and other operational procedures.

3) Practice with a roll of film to gain experience. During such practice record the film speed and other-readings set for each exposure of the film. Then study the quality of the picture obtained and critically evaluate for errors such as over exposure, under exposure, out of focus, field depth etc.

4) Load the camera with the film. Adjust the metering system as per the A.S.A. rating of the film.

5) Focus the lens by choosing the appropriate centre of interest.

6) Make the other adjustments such as aperture and shutter speed.

7) Expose the film by pressing the appropriate button.

8) Advance the film for next exposure.

9) On completing the exposure of all the frames in the film, rewind the film completely and unload it from the camera.

10) Process the -film and print it on a suitable paper.

11) Recognize the errors and improve them.

Film Speed

- Film speed is mentioned as ASA or DIN
- ASA = American Standard Association
- DIN = Deutsche Industries Norm.
- 100 ASA = 21 DIN
- 200 ASA = 22 DIN
- 400 ASA = 27 DIN

Thumb rule: Faster the film speeds lesser the exposure time. In fast films, chemical particles are larger Speed of the film also means the sensitivity of the film. Different types of film speeds available are 25, 50, 100, 125, 20, 400, 1600 and 3200 ASA.

Production of photographic image

The photographic process starts from the moment when the minute particles of the light sensitive chemical compound exposed to light. On exposure to light these particles undergo certain chemical changes and these changes are invisible. This invisible image is called as latent image. The development process involves the development of latent image into visible image. As we have discussed earlier, the intensity of light falling o the film is decided by three factors such as shutter speed, aperture size and film speed. The type of photographic papers available are (1) normal paper (2) soft paper (picture contrast is less) (3) hard paper (for more contrast). According to the purpose for which the photograph is meant for and the light intensity under which the film was exposed the type of photographic paper is

selected. For example, the picture meant for developing the printing block hard paper is more appropriate as it produces good- contrast in the picture.

Developing

Latent image is developed into visible image through chemical process. The developing solution contains methol, hydroquinone, sodium sulphate, sodium carbonate, potassium bromide or borax. After developing the image, it has to be fixed. The fixative contains sodium thiosulphate (hypo) solution. After fixing, the film is washed in running water for 40-45 minutes and then dried. This film is now called as negative which is used to produce the picture on the photographic paper. The negative is placed directly in the machine and exposed to light. Once the photographic image is exposed on the photographic papery it is to be developed and fixed as in the case of film. The developer used for developing film and paper are of different in quality and their compositions (see box).

Developer for film		
Methol	2 gm	for producing image
Sodium sulphate (anhydrous)	100 gm	Preservative to prevent chemical from oxidation.
Hydro quinine	5 gm	Used for contrast.
Sodium carbonate	10 gm	Activator
Potassium bromide or borax	2 gm	Activator
water	1000 ml	Solvent
Developing time	6-8 minutes	Maximum is 10 minutes.

For Developing Photographic paper

For Developing Photographic paper	
Methol	3.1 gm
Sodium sulphate	45 gm
Hydroquinone	12 gm
Sodium carbonate	80 gm
Potassium bromide	1.9 gm
Water	1000 ml

Developing tune	6-8 minutes
Stop bath	
Glacial acetic acid	30 ml
Water	1000 ml
Fix bath	
Sodium thiosulphate (Hypo)	250 gm
Sodium metasulphate	20 gm
Water	1000 lit

Photographic papers	
Quality	Code number
Extra soft	0
Soft	1
Special	2
Normal	3
Hard	4
Extra hard	5

The glossy type paper contains fine details. Therefore scientific photographs are printed in this paper. It gives fine quality pictures whereas matte paper gives dull finish to the picture.

Advantages of photography

1. Self explanatory
2. Cut across language barrier
3. Easy dissemination of message
4. Good proof of evidence
5. Aids in our interpretation
6. Valuable documents for preservation.

Aperture

Aperture is the window which actually controls the amount of light passed. Aperture is controlled by diaphragm. The aperture sizes are 22, 16, 11, 8, 5, 6, 4, 3.5, 2.8 and 1.1. In

darkness an aperture size of 2.8, 1.9, and 1.1 should be used. In Sundays an aperture sizes of 11, 16, 22 are more suitable, with a cloudy outdoor 8, 5, 6, 4 and 3.5 can be of the right aperture size.

Special photography

Photomicrography: Photomicrography is the, technique of photographing the objects that are visible through microscopes For example, photograph of the virus amoeba, bacteria and blood protozoans are obtained through this method. The objects that are not normally visible through naked eye but can be viewed under a microscope or electron microscope are those which are pictured through this technique: A camera is attached to the eye piece of the microscope in which the micro organisms are focused and pictures are taken.

Microphotograph

Microphotography refers to the technique of producing miniature or highly reduced microscopic images of the printed or visual materials on microfilm or card. For example, microfilming of the valuable documents, books, encyclopedias and ancient literature are done to preserve them for long time. Another advantage of micro filming is to reduce the storage space of large volumes of documents and to facilitate the mechanized retrieval process.

Photographs

- **Pros**: Photographs are good tools to make or emphasize a point or to explain a topic. For example, when explaining the shanty-towns in a third world country it would be beneficial to show a picture of one so the reader can have a better understanding of how those people live. A photograph is also good to use when the actual object cannot be viewed. For example, in a health class learning about cocaine, the teacher cannot bring in cocaine to show the class because that would be illegal, but the teacher could show a picture of cocaine to the class. Using local photos can also help emphasize how your topic is important in the audience's area.

- **Cons**: If the photograph is too small it just becomes a distraction. Enlarging photographs can be expensive if not using a power point or other viewing device.

4. Flash Cards

The flash cards are compact visual aids; the extension teaching can be made more meaningful and interesting with the help of the flash cards. The flash cards are approximately 10 x 12 inches in their size which are flashed before the audience to get their attention and to emphasize important I points in the message. The flash cards contain brief and stimulating messages. The message is presented in step by step manner for its easy understanding. It is su9gesteci to limit the number of flash cards to ten for any one presentation or talk. Even though a card size of 10 x 12 inches is sufficient for a small group, a minimum size of 22 x 28 inches card is necessary to cover a group of 40 to 50 people. The flash cards should be planned to present the subject in step by step. The flash cards can be used to highlight the important points in the focal theme or lession under discussion. They can also be used to summarise the important points and to tell the message at a glance.

Purposes

- To teach the students.
- To give health education.
- Useful for small group.
- Used in group discussions.

Principles

- The messages can be brief, simple line drawing or photographs, cartoons and the content will be written in few lines at the back of the each card.
- 10” X 12” or 22” X 28” is commonly used size.
- 10-12 cards for one talk can be used. It should not be less than 3 and more than 20.
- Prepare a picture for each idea which will give visual impact to the idea.
- The height of writing on the flash card is to be approximately 5cm for better visualization.

Using the flashcards

- For class room instruction, the flash card s is to be properly used. The following steps are used while displaying flash cards.
- Give brief introduction about the lesson to students.
- Give instructions to students about their actions while you flash the cards.

- Flash the card in front of the class by holding it high with both your hands so that all the students can see it.
- Let the student respond as per instructions already given.
- Review the lesson by selectively using flash cards.

Dos for using the flash cards

1) Do drive home a single idea in the flash card.
2) Do tell a story at a glance.
3) Do attract attention.
4) Do motivate action.
5) Do plan it carefully.
6) Do wordings briefly and clearly.
7) Do design the flash cards simply and aesthetically.
8) Do them colorfully
9) Do use attractive letters.
10) Do present them orderly and explain them clearly in an understandable way.
11) Do present them at appropriate time during the lecture.
12) Do use them along with other audio-visual aids for an effective presentation.

Advantages

- Flash cards can be used to introduce and present topics.
- It can be used to apply information already gained by students to new situations
- It can be used to review a topic.
- Can be used for drill and practice in elementary classes
- To develop the cognitive abilities of recognition and recall of students.
- It can work as a useful supplementary aid and can be effectively used with other material.

Disadvantages

- Cannot be used for a large group
- Prone to get spoiled soon
- Preparation is time consuming.

5. Flannel board

Flannel board is otherwise called as cloth boards or felt boards. The flannel cloth is inexpensive and widely available. Two pieces of flannel will stick together when they are kept over each other and a gentle pressure s applied. Materials such as sand paper, fuzzy yarns and other coarse and rough surface materials can easily stick to the flannel cloth. Thus by fixing pieces of flannel or sand paper or course materials to the back of the pictures, graphs, charts and other visual materials to be shown to audience, it is possible to display them easily over the flannel board and can be made use as a teaching tool. With this simple device, a variety of presentation can be made to keep the teaching learning process more interesting and simple.

For making a flannel board, the flannel or felt cloth should be fixed over a firm or solid backing material. The backing material should be light in weight, unbreakable, stiff and solid in nature. Light weight cardboard, plywood or boards made of synthetic materials shall be used as a backing material. The board should be of at least 30 x 40 inches and shall be made much larger or smaller according to the need. There is wide range of color choices available to make a flannel or felt board. Among flannel and felt cloths, flannel is cheaper but felt is long lasting and available in rich colors. One disadvantage with both flannel and felt boards is that though the materials adhere to each other and support light weight materials such as cardboard and plastic, the attachment intensity is minimal and therefore, the materials sometimes used to slip down or fall down while placing them on the board. To avoid this problem a sturdy nylon material called hook N loop or Velcro is made use of as a sticking material on the back of the pictures or letters. Any object backed with hook material and displayed on the hook N loop boards will not slip or change their positions until they are pulled away.

Use of Flannel boards

The appeal of the flannel board is that a progressive story can be unfolded or a sequence of events can be shown to the learners in the extension teaching process. It is one of the cheapest, most effective, versatile and easiest visual device available. The flannel board is particularly used with instruction storytelling, to develop diverse visualization patterns before the audience and to explain various steps to follow in an innovation adoption process. While using flannel boards the following suggestions shall be kept in mind.

The visual material should be simple, easily understandable and recognizable. Instead of wordy display, keep pictures and understandable symbols. The writing should be legible and large enough to be seen by everyone. The title, captions and illustrations should be brief and self explanatory. Draw the figures and. Illustrations clearly arid attractively. Use different sizes of board according to the group size and material. While explaining the visuals to audience don't stand before the board and block the audience vision. Preserve the visuals in a suitable filing cabinet for future use. Practice the display one or two times and get the suggestions of colleagues to improve upon before using in the actual situation.

How to prepare a flannel board?

Ready made flannel boards are available in the market. However, the extension worker can make his own flannel board to suit his needs. This will help him to save money as well as gives him enough flexibility to make his own board of choice. The following suggestions will help him to make a good flannel board of his choice.

Light weight plywood, cardboard or any synthetic material of size 1/2 inch by 3/4 inch shall be selected as background or base material. Cut the board to the desired size. A board of 3 by 4 feet is sufficient for a group of 30 to 40 learners. Now cut a flannel cloth slightly larger in size to the size, of the flannel board. Stretch the cloth over the board, fold the corners on all sides of the board and with the help of thumb pins or small nails pin them at the reverse side of the board. Mount board on an easel or fix it on the wall or on a blackboard stand for easy use.

Advantages

- Simple to use and easy to prepare visual.
- Less costly and very much flexible in its usage.
- Holds attention and keeps the teaching learning process interesting.
- Variety of visual materials can be displayed.

Disadvantages

- Transportation and storing of boards and materials is a problem. Suitable tables to support boards must be available.
- Time and cost of making material for presentation present a problem.
- Cost of boards themselves can't be overlooked.

- Presentation is limited a new idea involves a lapse of time before the new material can be added
- Might tend to deter one from using other more effective methods and techniques when it is evident that other methods might be more appropriate.
- To tell a complete story it often takes either too much board space or smaller designs and materials some of which cannot be seen well.

6. Poster

A visual combination of bold design, colour and message which is intended to catch and hold the attention of the passer-by long enough to implant or to reinforce a significant idea in his mind.

"Posters are the graphic aids with short quick and typical messages with attention capturing paintings." Posters in extension education are used to focus attention, arouse interest and attract the audience towards a particular information/message. Posters of 28 x 22 inches are convenient and ideal for use under different circumstances. A poster may contain a written message, diagram, map, picture or a cartoon. In short anything that will help to convey a fact, an idea or a message for which attention is called for is the content of a poster.

A good poster creates awareness & interest among the people. It inspires & takes people towards action. It consists of 3 main parts. The first usually announces the purpose or the approach, the second sets out conditions, & the third recommends action. A poster should be bold enough to attract attention of the people, & should communicate only one idea at a time. It should have simple letters which are clear & forceful. The size of a poster should not be less than 50*75 cm.

Aim

- to create awareness about extension programmes
- to communicate to a passer-by,
- to implant very quickly in the viewer's mind, or to make him recall a single important idea, and
- To motivate people to act by repeated reminders.

Principle

Posters are simple graphic representations of the greatest possible impact. As an advertising medium they arrest the eye and the mind; they remind the public of a message. Posters generally contain three main features; they announce a purpose, they set conditions and they recommend action.

Posters should be ***attractive, brief and clear*** – this is called ABC principle of poster.

Materials Required

Paper boards (colour or white) poster colours, pencil, eraser, scale and good brushes etc.

Procedure

First of all the message should be self contained. The theme or idea must be clear and succinct and able to be grasped at a glance. Remember the psychology of presentation – the prominent features of the posters must stand out sharply. Effective posters are usually pleasing to the eye. Good composition, colour and technique are the principle elements in preparing effective posters. Use any one idea, few and simple words. Plain and bold lettering, Leave plenty of space between letters, words, lines etc.

Preparation and rules

- To do a special job.
- To promote one point.
- To support local demonstration.
- Planned for specified people
- Tell the message at single glance.
- Use bold letters.
- Use pleasing colors...
- It should place, where people pass or gather.

Features of a good poster

- Brevity: message should be concise
- Simplicity: message should be easily understandable
- Idea: should base on single idea and it should be relevant.

- Color: suitable color and combination should be used to make the poster attractive and eye catching.
- Display: while displaying one should be sure to find a place where there is ad4equate light and where the larger population will see it.

Advantages

- It attracts attention.
- It conveys the message very quickly.
- It does not require a detailed study.
- Good poster leads to action with good motivation
- It can stand alone and is self explanatory.

Disadvantages

- Poster does not always give enough information
- When a poster is seen for longer time it may not attractive. So it should be dynamic

7. Charts

It is a graphic representation. In other words, charts are combinations of such pictorial, graphic, numerical, or verbal materials which together will be most likely to present clear visual summaries of important processes or relationships. They are often referred to as symbolized visuals. These visual symbols used for summarizing, comparing, contrasting or performing other services in explaining subject matter. A chart is a combination of pictorial, graphic, numerical or vertical material, which presents a clear summary.

Definition

Chart is defined as a visual aid which depicts pictorial and written key information in systematic way to summarize, compare, ex: anatomical charts and figure, diagrams etc.

Charts are used to present the information in a more understandable way to the audience. In the extension teaching learning situation, the charts are used mainly to analyse a problem or a situation. They show a proper sequence and relationship. The different types of charts that are commonly used in extension education are as follows

1) Time and sequence chart
2) Table chart

3) Strip chart

4) Flow chart and

5) Flip chart

The functions of charts

The charts are used in the extension teaching for the following purpose.

1. To emphasise a relationship and sequence.
2. To make the facts and figures meaningful and clear
3. To show the .operational procedures
4. To facilitate teaching learning process.
5. To show a vision of the idea in an understandable form.

Aim

- To analyze a problem or situation
- To show proper sequence and relationship.
- To communicate difficult, often dull subject matter in interesting and effective ways in extension work.
- To show or compare changes.
- To show size and placement of parts
- To show operational procedure.

Principle

- Teaching with symbols, sustains interest among the learners.
- It removes fatigue and makes dry and often meaningless facts, more understandable and interesting.

Materials Required

Tabulated data, large sheets of paper or card boards, pencil, eraser and also different colour materials.

Procedure

Study the data thoroughly before actually preparing the chart. Be clear first about the concept to be developed and the information to be depicted. Develop simple charts with only one idea. Maintain logical order – from large too small or small to large. Use good

proportions. Use symbols, words or colours to explain the chart. Use lines and bars of only one dimension. Words can be used to emphasis certain parts of diagrams, but titles and words would be held to the minimum, Titles for 8" x 10 ½ "sheets should be about ½ "high, for a 30" x 40" chart. The height should be about 2 ½ ". Labels, legends and codes should be smaller. All labels should be horizontal. Finally, make rough sketches to illustrate your ideas, try different lay out patterns and decide upon the combinations of colours. Always it is better to have not more than three colours.

Types of charts

Tabular charts

Tabular charts are used to bring together in compact form mass of related data. Anything that is recorded or presented in a tabular form is a Table Chart. It may also be used for comparisons or for listing advantages and disadvantages, e.g., the production, production capacity and requirement of iodated salt in India.

Tree charts

Tree charts are used for showing development or growth of a thing. The origin is a single line or other representation of the tree trunk; the various developments are shown as branches.

Flow charts/ Organisational

Flow charts are shown by lines, arrows, etc. They show organization or structure of departments, institutions etc.

Over – lay charts

Over – lay charts consist of a number of sheets which can be placed one over the other conveniently. On each individual sheet, a part of the whole is drawn. This enables the viewer to see not only the different parts, but also how they appear when one is placed over the other. After the final over-lay is placed, it shows the ultimate product. This type of presentation is dramatic and effective.

Pull charts and Strip (tease) charts

Strip (tease) charts are similar to the pull charts. Messages, words, pictures, etc., are concealed by using strips of thin paper instead of thick paper. The ends of thin paper strips are pinned or pasted to both ends of the messages on the big sheet. Whenever the message is to be

exposed, one end of the paper strip is stripped out. This has the advantage of surprise or anticipation.

Flip charts

Flip charts carry a series of ideas arranged sequentially. Individual charts are tacked or bound to some support and, as the lesson progresses, are flipped by the teacher. This kind of chart exposes the audience to segments of the subject, in sequence, and holds attention remarkably well.

8. Graphs

Graphs are the visual teaching aids for presenting statistical data and contrasting the trends or changes of certain attributes.

Method of preparation

- Before making the bar chart makes a rough sketch of it in a note book.
- For drawing the bar graph use the chart paper of 50x 72 cm size.
- Use two different color shades for the two contrasting groups.
- The bars should be equi-spaced.
- Write the key to the bar graph in a box on the right hand side corner of the chart paper.
- Numbers specifying the magnitude of the bars should be on the top on the bars.

Types

Pie graph: These are called as circle diagram. The data are presented thorough the sections of portions of a circle.

- In determining the circumference of a circle we have to take in to consideration a quantity known as pie.
- The surface area of a circle is to cover 360 degree.
- The total frequencies or value us equated to 360 degree and then the angles corresponding to component parts are calculated.
- After determining their angle, the required sectors in the circle are drawn.

Bar graph: The graphic presentation extends the scale horizontally along the length of bars. Each bar must be of the same width, height of the bar over a period represents the

corresponding time of the variable. Graphs are available in 2 forms that are vertical and horizontal.

Line graph: To show the trends and relationships ex: single line shows the relation and the variation in the quantity. Quantitative data are plotted or when the data is continuous. The concepts are represented with the help of lines drawn either horizontally or vertically. The plotted points are connected to one another, instead of the base thus producing the curve.

Pictorial graph: It is an outstanding method of graphic representation. Pictures are used for the expression of ideal; they are more attractive and easily understood. Vivid pictures will be used to create rapid association with the graphic message; each visual symbol may be used to indicate quantity.

9. Diagrams

A diagram is a graphic design that explains about a concept or a thing. In the diagram, drawings are made to show the arrangement and relationship of various parts. It is a line drawing made for mathematical or scientific explanation during the teaching, learning process.

The following suggestion shall be kept in mind while drawing a diagram

1) Use ruler, pencil, curves and compass.
2) Diagram should be large enough for everyone to see it clearly.
3) Diagram should be simple and easily understandable.
4) Diagram should be made accurately to scale.
5) The lines and drawings should be neat and clear.
6) Ample space should be given between the lines and remove unnecessary lines in the drawings.
7) Suitable titles and captions should be given.
8) The titles and captions should be brief and self explanatory.
9) Various parts in the diagram shall be clearly notified.
10) Display them at a proper place to attract the attention and arouse the interest of every one.

How to use the diagram for extension teaching?

A diagram plays an important role in the extension teaching process. Diagrams are easy to make and are effective devices for instruction. Various improved agricultural implements and their mechanism of operation shall be easily explained to the farmers with the help of diagrams. For example, a pesticide sprayer with its parts and its operational procedure can be explained well with the help of a diagram. A diagram helps. To overcome the monotony in teaching and facilitates easy understanding. A diagram can be easily drawn on the blackboard during the course of the lecture. Drawing of complicated diagrams on the blackboard can be made easily by tracing out the projected image of relevant pictures projected with the help of overhead or slide ‘or an opaque projector on the blackboard.

The other ways in which the diagrams can be used during the extension teaching process are as follows

1) Suitable diagrams can be drawn on a chart and the same is displayed over a bulletin board.

2) By using flannel boards, diagrams can be explained to the audience.

3) The extension worker can also make use of the printed diagrams which are commercially available in the market.

During the teaching process the diagram should be presented at the crucial moments. A brief explanation of the diagram should be made for the easy understanding of the audience. Circulate the copy of a diagram among the participants individually for a clear understanding. Encourage the participants to practice the diagram on their own.

Dos for the use of diagrams

1) Do decide where exactly the diagram is to be drawn for the purpose of explaining the fact.

2) Do collect relevant pictures from all available sources.

3) Do draw the diagrams legibly and label all its parts.

4) Do give suitable title and caption.

5) Do draw the diagram in an appropriate size.

6) Do point out the each important point in the diagram.

7) Do discuss the information given in the diagram.

8) Do test the audience understanding of the diagram.

9) Do use the diagram with other relevant teaching aids.

10) Do follow up by displaying the diagram on the bulletin board.

10. Map

A map is a graphic aid representing the proportionately as a diagram, the surface of the earth, world or parts thereof. It conveys the message by lines, symbols, words and colors.

Types of maps

- Political maps: these maps show political divisions of the world, a continent, a nation.
- Physical maps: shows the physical contour of a place, area, and region.
- Relief maps: it shows the actual elevations and depressions in a place, area, and region.
- Weather maps: shows the amount of rains, temperature extremes, humidity in an area, region country.
- Population maps: shows the distribution of population in various parts of region, country.
- Picture or tourist maps: shows historical spots monumental sites.etc.
- Road maps: shows the roads of a region connecting various parts and points together.
- Railway maps: shows the railway links between various points.
- Air maps: shows the air routes between various points.
- Sea root maps: shows the sea routes between various sea ports

11. Specimen

A specimen is a small pièce, part or sample representative of the real object or material. In the extension teaching specimen or representative sample of the real things plays an important role in showing the farmer about a new innovation, a hybrid seed, weeds, disease affected parts etc. The types and forms of specimen selected for showing to the farmer depends upon the purposes for which they are used.

12. Models

Many times under practical conditions the real objects are not always available. Even when they are available, they might be too big, too complex and too cumbersome to handle in the teaching learning situation. For example an extension worker cannot bring a real cow or a tractor or a pneumatic cart into his classroom for demonstration or explanation. In such

situation, the models simulating the real objects come to the rescue. The models are simulation of real objects. Mostly the size of the models is made smaller than the real objects for the sake of space, economy and operational easiness. Extended or enlarged models are also made to conduct an elaborative study. Irrespective of the size of the models original characteristics of the real things are carefully reproduced. For example, in order to explain a water shed management pattern to the farmers, it is difficult to explain to the farmers theoretically. Instead a small mode' of water shed management can be made inside a room or outdoor so as to give the farmer an exact picture about a water shed management. Through the model farmer can easily understand the ways of bund construction, water conservation, and storage tank and water distribution channel to the field.

Mockups

Mockups are the simulated substitutes of real things. The mockups of tractor, pesticide sprayer, milking machine, reproductive system of a cattle help as a substitute of real model to demonstrate and teach the functions of a real model. Before asking the farmer to experiment with a live model, for example, how to operate a tiller, the same can be practiced in a mockup model. This will facilitate him to understand the working principle and handle the equipment with ease when he does it at the real life situation. By keeping a mockup of a biogas plant one can easily' explain the farmer about the working principle by demonstrating through the mockup. Similarly, the contour maps, miniature dioramas can be constructed to use as mockup models for aiding teaching learning process in the extension education.

Types of models

The models can be generally classified into three types: (i) solid (ii) x-ray and (iii) working model. The solid models represent the external features to simulate the real things. The X-ray models are designed to reveal the internal features of a real life object such as internal anatomy of human body, cross section of a machine, biogas plant etc. Working models are used for demonstration purpose in the teaching learning process.

Types of materials used

Wide range of materials such as white cement, cement mortar, casein glue, plaster of Paris, flour paste, wood, cardboard, plywood, water clay, plastic' and other synthetic materials such as poly fibers can be used for preparing the models.

How to use specimens and models in extension education?

Careful planning, preparation and handling are necessary for the effective use of specimens and models in an extension teaching learning' process, the following are some of the suggestions for the use of specimens and models in extension education.

1) Collect the specimens and models of various types from all the available sources.

2) Using real objects as models and specimens will be more effective than the artificially prepared one.

3) Use of models along with other audio-visual aids help to maximize the effectiveness in the 'teaching learning process.

4) Prepare the models in a simple way.

5) Display them in a clearly visible manner so that everyone could make use of them.

6) On displaying the specimens and models, explain them to the learner step by step in a logical order.

7) After the demonstrations are over allow the learner to handle them for a clear understanding.

8) Clarify their doubts and test their knowledge acquired through the learning process.

PROJECTED VISUAL AIDS

1. Slides

Slides in 2 x 2 inches mounts are available in different formats such as 35 mm, half frame and super slides. The focal distance need to be changed whenever these different formats are used. Loading of the slides into a slide carrier or magazine or tray for projection is one of the important techniques that many of the communicator gets confused sometimes. Hold the slide on your right hand and view through the slide and invert the slide to left, so that the image is .upside down and insert the slide into the carrier. Thumb spots given at the left, and down corner of the slide should help to position the slide. On loading the career the thumb spots should be positioned in the top right hand corner of the slide on the side that is away from the screen when the slide is positioned for loading. The thumb rule in mounting the slide is, for direct rear screen projection, slides should be turned so that the image is reversed as well as inverted.

Handling of the slides

1) Check each slide before mounting. Make sure that you know exactly what you will say or do with each slide.

2) Handle the slides by their mounts. Do not touch or scratch the film surfaces. Dusting of slides needs to be done with a cotton or soft brush or lens tissue paper or cloth. Cotton soaked in water or film cleaning agent applied carefully will help to avoid scratching.

3) Arrange the slides in proper showing order. A desired showing order can be indicated by running a piece of colored scotch tape diagonally across the top of a set of slides and then cutting the tape between each slide.

4) After use, the slides are to be neatly arranged and stored in the slide box. Suitable labeling can be done over the box specifying the subject and number of slides for easy retrieval process.

Types of Slides

The 2 x 2 inches slides can be made with (I) cellophane (2) etched glass, (3) plain glass (4) lumarith (5) silhouettes and (6) photographic prints.

Among the various types of slides, the preparation of the photographic slides required special equipments and training it needs camera photographic film and dark room processing facilities. The other type of slides can be readily made with the materials purchased from the local stationery shops.

Cellophane slides

The materials required for making a cellophane slide are

1) A sheet of plain or colored cellophane.
2) A sheet of carbon paper
3) A binding tape roll.

Before making the slide, layout the slide on a piece of paper, Give a margin of 1/2 inch on all sides. The steps to be followed are:

i. Fold the sheet of carbon and place the cellophane in the centre.
ii. Insert the ‘carbon and cellophane, in typewriter and stencil cutting is made by typing the material on cellophane through the carbon.
iii. The cellophane is then to be removed and placed in between two pieces of cover glass.

iv. Secure the glass with a binding tape.

v. With slide in correct reading position, place a thumb mark (dot) in lower left hand corner.

Etched glass slides

The etched glass is a fine piece of glass with a roughened surface that will readily take Indian ink, colored slide inks and pencils. A piece of etched glass, plain glass cover, colored slide pencil and binding tape are some of the equipments required to prepare the etched glass slide. The following steps are involved in the preparation.

1. Prepare the material to be made into slide in a sheet of paper appropriate to the glass slide size.
2. Keep the etched glass over the sheet of paper and trace the material on the roughened surface with color pencil, If ink is used, a thin coat is needed to apply for preventing it from cracking when it dries.
3. A plain glass sheet is placed over the etched glass as a cover.
4. Both the pieces of the glass are secured well with a binding tape.
5. With the slide is in correct reading position, a thumb mark (a dot) is placed at the lower left hand corner.

Plain glass slides

To prepare plain glass slides the following materials are required (i) Two pieces of cover glass (2) Indian ink (3) Pen and (4) a binding tape. Cover glasses of good quality may be purchased and their surfaces are, cleaned well to take the ink. Cleaning fluid, alcohol, carbon tetrachloride or soap water will be satisfactory to clean the slides. A linean or tissue can be used to dry the slides. Now the slide surfaces can be used to write or draw the material as in the case of etched glass slide. Other ways to prepare the slide to take colored ink are (1) to paint the surface with a light coat of clear shellac (2) cover the surface with a solution of glue dissolved in hot water (3) keep the slide in hypo solution and then clean it with water for two to three minutes.

Lumarith slides

It is very much economical to use lumarith sheet for making slides. A sheet of 20 by 50 inches can yield approximately seventy to seventy five 3 1/4 by 4 inches slide pieces.

Insert the celluloid piece between two pieces of cover glasses to make your slides completely permanent. The procedure followed in the case of preparing etched glass slide is also applicable to prepare the lumarith slides.

Silhouette slides

These slides are very popular in the extension teaching as the silhouette effects can be made by cutting out an object such as insects or flowers and placing it between two pieces of cover glass or by placing the paper from which the object is cut between the cover glass. A dark image or a light image of the object is obtained on the screen. The use of colored transparencies or cellophane with the cutout image will help to produce interesting results. The two cover glasses can be fixed tightly by means of binding tape.

Slide Craft Slide

The slide craft slides are plastic slides which can be made by ink, crayon, print or type materials. These slides are light in weight and are available in 3 1/4 by 4 inches and 2 x 2 inches sizes. The slide material is placed over a picture or material to be shown and then tracing is made by a pencil or with an opaque ink. Then suitable color is given using slide craft crayons or with any suitable coloring material. After completing the slide craft slides, the slide may be placed in the projector with marking over the right hand corner top. Since, the typewriter ribbons do not leave an opaque image on the slide craft slides, the slide is placed in a folded piece of good carbon paper and the matter is typed. After typing, the carbon sheet is to be removed. Now the slide is ready for use.

35 mm slides

These slides are playing an important role in all areas of communication and teaching because they can be made easily pertaining to specific things. These slides are inexpensive and can be made easily. These slides are prepared by exposing the material in a photographic film using a camera. Black and white and colored slides can be prepared according to the type of film made use of in the camera. Black and, white film also can be made into colored by using suitable coloring material applied on it. However, very limited color combinations are possible by this method. Using Kodak chrome positive films we can prepare indoor or outdoor slides of this type. A variety of outdoor pictures can be taken using these films and can be used as slide after processing it in the laboratory. The following steps should be followed while shooting the picture for making slides.

1. Load the camera with film.
2. Clean the lens with a tissue.
3. Focus the objective according to the operational procedure of the camera in use.
4. Check the shutter speed and distance.
5. Trigger the camera and shoot the picture.
6. On completing the role rewind it and put into the container and send it for processing.
7. On processing cut the film into individual slide and mount them in a plastic or cardboard slide mounted.
8. With slide in correct viewing or reading position, place a thumb mark in the lower left hand corner.
9. Check the slide using the overhead projector and select those slides with good picture quality.

Dos' for using the slides

The following are some of the important points that are to be taken care of while using the slides in the extension teaching.

1. Do plan the right spot for the use of slides in the teaching plan.
2. Do select the right slides.
3. Do arrange the slides in right sequence.
4. Do make your own slides for specific purposes.
5. Do arrange the slides in the proper showing order with the thumb mark on the upper right hand corner.
6. Do focus the projector and set up the screen.
7. Do check the projection and correct the screen and projector position.
8. Do check the seating arrangement and physical comfortless to view the slide show from all the sides of the room.
9. Do talk with the projector operator to explain the signals to be communicated by you as instruction to the operator.
10. Do present the slides along with the combination of other audio-visual aids.
11. Do reshow the slides if necessary.
12. Do number the slides and write the content and keep the copy with you for your information.

13. Do start the slide show with attractive picture of pleasant nature and end the presentation with the last slide bearing thank you.
14. Do practice it before going to the real presentation.

2. Film-strip projector

Film-strips provide an economical means of presentation of information. Film-strips are cheaper than separate 2 x 2 inch slides. Although slides are projecting the same size screen image they usually produce a brighter picture. Since the film-strips present pictures in a fixed sequence, they provide a structure for the subject. Film-strips are convenient and flexible to use. It can be used effectively in group of any size and is simple to handle and operate upon.

The film-strips are made of 35 mm film. Film-strips represent presentation of still pictures on any subject in a sequential manner. There are different varieties of film-strips such as silent, sound, black and white, color and with or without frame numbers and captions are available. The sound film-strips are accompanied by cassette recorder synchronized with the frame changes.

Operation of Film-strip Projector

The following operational procedures shall be kept in mind while operating the film-strip projector.

1. Set up the projector at its place with proper elevation from the ground.
2. Connect the projector with a power source.
3. Turn on the lamp. Adjust the projector by using its elevation knob in the front or by moving the projector front or back to get proper image size on the screen.
4. Using the focus knob, focus the light beam to get sharp edges of light beam on the screen.
5. With the starting end of the film-strip at the outside of the roll, keep the film-strip roll in the carrier fixed at the top of the machine.
6. Pull the film-strip holder spool. Pass the start end of the film-strip over the film-strip holder spool and thread the film down into the film-strip carrier slot by pushing it gently.
7. By using the first frame of the film-strip adjust the framing lever until a complete frame is entered on the screen.
8. Focus the picture to get a sharp picture on the screen.

9. By turning the film-strip advance knob, advance the film-strip frame by frame and to reverse the frame turn the knob in anticlock wise direction.
10. After completing the show, remove the film-strip and keep it safely in the container.
11. Remove the power supply by disconnecting the cord.
12. Remove the lens and keep it in the case. Keep the machine in its case cover it properly and secure the case with its locks.

Handling of Film-strips

The film-strip is roll of film with positive images. Each frame consists of a separate picture. Film-strips vary in length but it will be desirable if the number of frame ranges from 50 to 75. The film-strips come in two picture sizes such as single frame with ¾" x 1" size and the double frame with 1½ x1" size. The single frame type is widely used and it is printed across the width of the film. In double frame type, the picture is along the length of the film which is run through the projector horizontally. Proper handling of film-strip is necessary to protect the film-strip without damage for a long me. The film-strips on certain subject matter are very rarely available and o they must be properly handled for a longer life. The following points are being considered for proper handling of film-strips.

1. After a film-strip is used, it has to be re rolled into a small coil and placed in its storage can.
2. Never cinch the strip to reduce the size of the roll. Cinching of the filmstrip produces scratches on it. Reroll the strip instead of cinching on
3. Handle the film by the blank leader or with the edges. Do not touch the film surface.
4. Smaller and brighter pictures on the screen are more effective than large pictures with little clarity.
5. Handle the film-strip gently.

How to make a Film-strip?

For the preparation of film-strip you have to

1. Decide the subject matter.
2. Collect the facts and figures.
3. Prepare photographs and visuals to be shown.
4. Outline the subject matter.
5. Plan a script according to the time.

6. Prepare a script.
7. Specify each frame and shot.
8. Arrange the matter/picture for each frame in a logical sequence
9. Give suitable titles wherever necessary.
10. Shoot/photograph each frame in the proper sequence.

While preparing the script for the film-strip, the sequence of the subject matter, number of frames in which it has to be adjusted and the time framework are need to be kept in mind. A script is written to detail out the story into important sequence by breaking down into number of components. After finalizing the script a planning card is to be prepared for each frame of the film-strip. A sequence of such planning cards is to be prepared for a film-strip before attempting to make it. A sample planning card is shown below

FRAME NUMBER	Type of picture to be shown
VISUAL	1. _____ 2. _____ 3. _____ _____
AUDIO	Detail out audio component. List the points to be explained for the picture
Remarks: Write here the special instruction if any to be followed.	

Advantages

1. Film-strips and film-strip cheap in cost. projector are easy to maintain and comparatively
2. Easy to operate and handle.
3. Very compact to handle, light weight and easy transportation is possible.
4. Easy to prepare the film-strip and simple to project them.
5. Very much flexible to use. The rate of presentation can be adjusted at the convenience of the user.
6. Attention is focused on one aspect at a time and that particular aspect represented in the frame can be discussed at length.
7. Modifications according to the needs of the audience are possible.

Limitations

1. The sequence or order of the film-strip cannot be changed.
2. While presenting, it is not possible to skip the frames.
3. Since the pictures are not mounted on any material, the edges are prone for easy damage.
4. The effect of a motion picture cannot be achieved in it.

Dos for using the Film-strip

1. Do determine the subject that could be effectively illustrated.
2. Do select/prepare the proper film-strips for the subject matter selected.
3. Do preview the film before using it.
4. Do check the projector and its arrangement.
5. Do check the physical arrangement of the hall.
6. Do present the film in a professional manner.
7. Do reshow the film if necessary
8. Do prepare the film-strips of your own interest apart from purchasing from an outside agency.
9. Do keep the film-strip well protected to prevent from getting damaged while storing them.

Like slide projectors, film-strip projectors are also available with built in tape recorders for combined sound and picture presentation. The film-strips are to be used mainly when the extension educationist needs to introduce a theme of concept in a sequential manner. For example, subjects like eradication of rats, prevention of malaria etc., needs a sequential presentation if the topic which makes the learner to understand the message in a sequential manner which introduces the subject, focus the problem and ends with the action called for. Film-strips are therefore a very handy tool in most of the extension teaching and learning process.

The film-strip is a roll of film with positive images. Film-strips provide an economical means of presentation of information. The film-strips are made of 35 mm film and the subject matter is presented in a sequential manner. There are different varieties of film-strips such as silent, sound, black and white and color, with or without frame numbers and captions are available. The sound film-strips are accompanied by a cassette recorder synchronized with the

frame changes. The film-strips vary in length but it will be desirable if the number of frame ranges from 50 to 75. The film-strips come in two picture sizes such as single frame with 3/4 by 1 inch site and the double frame with 1.5 by 1 inch size. The single frame type is widely used and it is printed across the width of the film. In double frame type, the picture is printed in such a way that the width of the picture is along the length of the film which runs through the projector horizontally. Some of the advantages of film-strips are their easy operation, cheap in cost and flexibility associated with their handling.

3. Overhead Projector

The new visual aid overhead projector is at present widely used for and has become very much popular due to its easy operation and versatility. Through overhead projection it if possible to project a wide number of visual aids such as charts, graphs, pictures, maps and diagrams In comparison to slide projector, projection equipment contains a large aperture (10x10 inches). The software components used in the overhead projector are very less expensive and easy to prepare. The instructor can write directly on the transparency with the marking pen. Instant preparation and use of this aid is possible. This is one of the biggest advantages of this aid in comparison with other visual aids. The overhead projector enables the communicator to face with the audience from the front of an illuminated room and projection is possible on the screen above and placed behind him. The speaker can write, draw and erase while he is presenting and lecture. The transparencies for presentation can also be prepared in advance and made use of at the appropriate places during the lecture.

Operational Procedure of Overhead Projector

1. Set up the projector at the appropriate place with the projector lens facing the screen or wall.

2. Turn on the switch for blower or fan.

3. Turn on the light switch.

4. Place the transparency of the glass top with right side up.

5. Adjust the projector lens until sharpness is obtained in the image.

6. While attempt to explain the material keep a pointer on the transparency directing the point to be stressed.

7. While standing near the projector kindly ensure that you. Are not obstructing the audience vision.

8. Even though overhead projector can be used in a well lighted room, slight darkening will considerably improve the projection. Generally, a 70 X 70 inches screen suits the overhead projector. The screen is arranged in such a way that the beam of light emanating from the projector is perpendicular to the surface of the screen.

Advantages

1. The equipment can be used in a well lighted room and unlike in other projected aids, no darkening is heeded.

2. The speaker is facing his audience all the times and can therefore observe the audience reaction well.

3. It is possible to maintain eye contact with the audience and there is no turning of back to the audience.

4. Instant use of the aid is possible without any prior preparation of the aids.

5. Comparatively the transparencies can be prepared economically and reuse of the material is possible after wiping them with alcohol or xylol.

6. Easy handling and less storage space is required for both the projector and its visual materials.

7. Progressive disclosure is an important feature that can be accomplished readily on overhead projector. This can be done by simply covering that portion of transparency sheet which is not to be seen with an opaque page or material.

8. With overlays a new concept of inscription is opened by the gradual build up of a situation by super imposition. This technique is of great help in communicating a basic idea or concept -to the audience.

Limitations

1. The light source is so bright that it often irritates the eyes of the communicator.
2. The heat generated by the lamp also causes discomfort.
3. Only very restricted movements can be shown with the help of this projector.
4. At present, the commercially prepared transparencies are rarely available in the market. Since, the overhead projectors are mainly developed to help the instructor to prepare their own material; this constraint is rarely thought of by anyone.

Transparencies for overhead projection

The overhead transparencies are the visual materials which can be prepared very easily and permit a high degree of enjoyable creativity in the preparation and presentation of ideas, both verbal and visual. With transparencies, it is possible to use a number of methods to disclose ideas in a colorful sequence create suspense, surprise and stimulate viewers attention Using overhead transparencies in a proper manner make the communicator to feel success in communicating ideas and ensures audience participation. A comfortable degree of room light can be maintained during the presentation. This helps the audience to see the projected images and the communicator to keep eye contact.

Basic techniques for transparency preparation

1. Using of opaque material to make light and dark areas on the screen.
2. Using appropriate colors as required by means of translucent inks or colored plastic sheeting.
3. Adhesive stressed plastic materials can be used in the transparency to polarise light and then by spinning a special plastic disc in the polarised light passing to the screen for creating illusion of- motion in transparency image can be made.
4. The projecting elements such as dial wheels, machine parts which can be possibly manipulated on the transparency as moving parts.
5. Overlay of transparencies can be done to block and present ideas.
6. Transparencies for overhead projection normally should be oriented horizontally. If they are oriented vertically and used in a room with a flat floor and low ceiling, the lower

portions of the projected image may be lost by materials placed in front of the screen and the top will extend off the screen, sometimes on to the ceiling. Further, the horizontal format is less subject to key stoning than the vertical key stoning which produces a screen image wider at the top than at the bottom one way to correct the keystone effect is by tilting the top of the screen forward to ensure that the projected image falls on the screen at 90 degree angle. The key stoning can also be reduced by raising the back of the projector a bit.

7. The materials in vertical format, such as printed page require special treatment. To use it for projection, the material is to be divided into two or more parts and remounted in a horizontal form.

8. Whenever you want the audience to see the document in full, show it briefly in full scale and then show highlights.

9. The transparencies can be prepared by means of direct method using felt pens, typewriters and silhouettes. The indirect method of transparency making is by means of heat process, Xeroxing, electrostatic process and picture transfer lift process.

Overlay technique in transparency making

Combining images is the basic principle for making overlay transparencies. While using the overlay technique in transparency making, first show the base transparency sheet that carries the initially required information. This base is usually mounted on one side of the mask, which rests on the projector stage. Subsequently, place additional acetate sheets, each containing more information over the base. Thus as the sheets are pinned over in sequence, the projection shows new information. While doing so, position each sheet in such a way that it lines up properly with those beneath.

Tips for Effective presentation with Overhead Transparencies

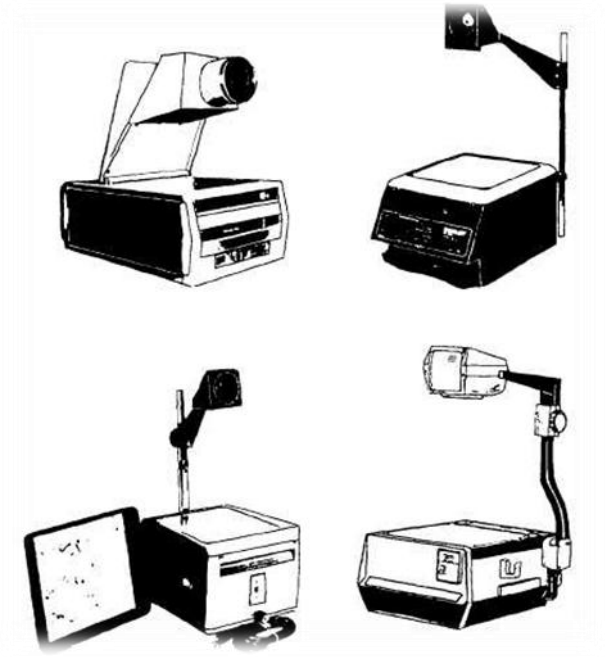
1. Don’t read the transparency from the screen.
2. Talk to the audience and maintain proper eye contact.
3. Don’t overcrowd the transparency with written materials.
4. When showing the transparency, use a pointer, such as a short pencil or pen to direct attention. The pointer will appear as a moving shadow on the screen.
5. To avoid glaring light on the screen when changing the transparencies, insert the one to be shown into the light beam above the projector table and remove the below one which has

been shown. This technique creates a dissolving effect. If no image is shown cover the light table with a piece of paper or turn off the projector light.

6. Suitable abstracts or handouts shall be made available to the audience.

4. Opaque Projector

The use of opaque projector or epidiascope in the extension teaching helps the communicator to (i) stimulate attention (ii) arouse interest, (iii) clarify information and (iv) help the receiver to gain knowledge more rapidly and retain it for a longer period. It can also be used to introduce subjects or topics of interest, to present specific information, documents and to ensure teacher learner participation. The materials that can be used in opaque projector are very many. As the name indicates wide variety of opaque materials can be projected. Transparencies are not required. There is no need to prepare slides or films. Bring the material and project. A wide range of free and inexpensive materials are available for make use opaque projector. Books, pamphlets, leaflets, diagrams, pictures, drawings, magazines, typed or printed pages or any other materials relevant to the subject of interest can form the projection material.



The usual complaints about the opaque projector are its dull image and necessity to darken the room. In recent days the opaque projectors are fitted with improved optical systems and reflection lamps. Such improved projectors produce clear and. sharp images and can be

used in lighted rooms like overhead projector. The other common disadvantage of the opaque projector is its weight and too heavy for its handy use. This problem was overcome by using light weight materials and metals. There is no need to mount opaque materials since the modern opaque projectors are designed with vacuum type platens which can hold the copy from 8 ½ by 11 inches size to postage stamp size without any fluttering. No longer is the platen lowered to insert the opaque materials. The modern opaque projectors are equipped with belt conveyor that will permit the opaque material to be easily inserted without lowering platen. The built in optical pointer permits the instructor to direct an arrow of light to any point on the projection screen. This permits the instructor to point out without leaving the projector as well as casting and obstructing shadow as in the case of a conventional pointer.

Selection and preparation of projection materials

1. The projection material selected should be of the size 10 by 10 inches or less than that in its dimension.
2. For permanent mounting of the material, a medium thickness cardboard can be selected.
3. The cardboard shall be cut to the size of the platen.
4. Neutral colors or colored background or colors that match with the picture shall be used for more dramatic effect.
5. The pictures or materials for projection shall be cut and mounted on the cardboard,
6. The illustration is inverted when placed in the projector. Therefore, centre the material on the cardboard in such a way that extra space is allowed on the right side.
7. Using a suitable adhesive material, the picture or the material to be projected is pasted on the cardboard.
8. A brief title or explanation can be written over the material.

How to use an opaque projector

The opaque projector is usually used to project illustrations, diagrams and pictures during the crucial moments in a presentation or lecture. However, it can also be used to project a series of pictures as in the case of slides or film-strips. The following points can be kept in mind as a guideline while using the opaque projector.

1. Check all the physical features such as arrangement of the class room, light intensity, ventilation, projection screen and materials to be projected for their properness to help a successful presentation.
2. The materials to be projected must be arranged in proper showing order. The materials should be kept at the right hand side of the machine, face up and inverted same as the position of the picture or material kept inside the projector. Such arrangement helps to place the material correctly once the room is darkened.
3. The projector and screen need to be adjusted for proper focus and clear picture. The screen size and the focal length of the lens are the factors to be considered for determining the distance between the screen and the projector.
4. A smaller and brighter image can be obtained by shortening the distance between the projector and screen.
5. The projector is to be tested by turning on the projector before the beginning of the lecture. To meet the emergency always keeps an extra projector bulb in your hand. Adjust the materials suitably for a better picture.
6. While presenting the picture at the crucial moments in the lecture explain them briefly and try to focus the attention of the audience by pointing out the main points with the help of a pointer.
7. Use other AV aids such as flash cards, slide projector, overhead projectors to create an audio-visual mix in the presentation.
8. After completing the lecture, analyses the presentation for its merits and demerits.
9. Make your merits stronger and improve the demerits in the future presentation.

Operation of Opaque Projector

Operating the opaque projector is very simple and it has nine basic steps to follow

1. Set up the projector and connect it to power source.
2. Switch on the lamp and cooling motor.
3. Place the opaque material to be projected on the metal tray or platen.
4. Push the housing in place with the lever.
5. The bottom of the picture should face the front of the machine.
6. Adjust the lens and bring image to a sharp focus.
7. For smaller pictures and materials, use the card holder in the slot under the metal tray.
8. After showing the projection, turn off blower and projector lamp.

9. Remove the power supply, roll the electric cord and cover the projector.

Points to Remember

1. Do not show any object or paper which may be damaged by heat.
2. The metallic objects absorb heat and becomes hot. So care is to be taken while handling such objects.
3. The valuable documents, thin paper and books need to be taken care while inserting and removing them from the projector. Cover them with heat resistant glass to avoid damage to pages and materials.

The opaque projector also can be used as an enlarger to trace the picture on the blackboard or a paper sheet. To show the strips of mounted, pictures, moving belt platen is to be used. By turning the handle, pictures can be moved smoothly through the machine. For maximum illumination on the screen the projector may be located close to the screen.

NON PROJECTED AV AIDS

1. Drama

Drama is one of the most popular forms of traditional media. Let us understand this form by using an example from the rural areas. After completing the work in the fields, you very often find that farmers celebrate their joy of leisure. They use different types of art forms for this. They use natural colours for makeup. Performance themes are from their own sufferings, daily work, future dreams and mythology. Here the viewers can also participate as and when they feel like.

Some of these forms of drama performed in different states.

Tamasha: If you happen to watch a tamasha performance in Maharashtra, you will come to know more about their ancient rulers, Maratha heroism, their rugged landscape, their music etc.

Nautanki: The Nautanki form found in northern India entertain their audiences with often vulgar and disrespectful stories. Rooted in the peasant society of pre modern India, this theatre vibrates with lively dancing ,pulsating drumbeats & full throated singing .Unlike other styles of Indian theatre, the nautanki does not depend on Indian religious epics such as Ramayana or Mahabharata for its subject.

Khayal: Khayal is mainly performed in Rajasthan. It is a combination of song, dance and drama. Music is an important aspect in this form of folk theatre. It is performed not only for entertainment purpose but it is used mainly as an essential means of communication between actors. There is an immense variety in the use of singing—sometimes by the characters individually or in the chorus. Instrumental music is also used in the beginning of the performance to create a favorable atmosphere for the play.

2. Street Theatre

This is a performance medium drawing its techniques from traditional drama forms in India. They are performed in any nukkad (street corner), street, market place etc.

In such a situation, the audience and the performers are on the same level, emphasizing the fact that the performers are not different from the audience themselves. This also leads to the establishment of a rapport between the performers and the audience. Close eye-contact with the audience is an important element in street theatre which keeps them busy with the action of the play. Even an actor is under the eagle eye of the audience who surround him on all sides. So together they feel a sense of belonging and responsibility to each other. Sometimes the audience is invited to join the chorus for the singing.

Street theatre

The sole purpose of street theatre is to motivate the audience to take a quick and required action on a particular issue. In India, waysides, streets, village markets, open-air grounds, fair-sites, country yards and other public areas have remained the ideal spaces to perform street plays.

A majority of street plays in India are based on socio-political issues. Some of these are based on current events, others are on subjects like communalism, terrorism, police atrocities, bride burning, dowry system, caste inequalities, elections, industrial and agricultural exploitation, alcoholism, illiteracy and drug addiction.

Some of the best street theatre artists from India include Safdar Hashmi, Utpal Dutt, Sheela Bhatia, Habib Tanvir, Shombu Mittra, Bijon Bhattacharya and many more. Street theatre artists try to spread positive ménages in the society. For example in Punjab, Gursharan Singh through street theatre is spreading a message of understanding, patience and tolerance.

He took to the streets to use plays as a means of awakening the people to their fundamental and political rights. In the early eighties, when Punjab was swept by terror waves, Singh went out into the streets with his classic street plays such as 'Baba Bolda Hai', 'Sadharan Log' and 'Main Ugarvadi Nahi Hu'.

3. Puppet show

One of the old and popular arts in Indian villages is puppetry. Puppetry is an education cum entertaining aid in which puppets manipulated by the performer is a person termed as a characters in a story to be depicted.

Definition

A puppet is a manipulative doll dressed as a character and the performer is a person termed as a puppeteer. A good puppeteer has to blend his art with dramatization to produce the desired effect. It is used as an effective teaching aid for languages and social sciences.

Puppet show

Types of puppets

1. *String or marionettes puppets:*-Marionettes consist of puppets with hinged body parts which are controlled by nine strings produces required movements in the puppet. These puppets are mainly manipulated by professional puppeteers.
2. Stick puppets: - stick puppet are the painted cutouts attached by sticks. The actions of these puppets are manipulated by the teacher and students by hiding behind a screen so that only puppets are visible to the audience or the class.
3. *Shadow puppets*: - shadow puppets are silhouettes of cardboard which produce shadows on white screen. The motion of these silhouettes is manipulated by the teacher and students.
4. *Finger of hand puppet:* - Hand puppets are round balls painted as heads with overflowing colorful costumes. These are worn on fingers which operate their movements. These are operated from below the stage.

Selection

In writing or selecting a puppet play, the age, background and tastes of the students should be taken in to consideration. A short puppet play is always preferable.

Advantages

1) Creates interest

2) Gives the knowledge in a brief period

3) Puppet is an effective method in teaching.

4) Motivate students

5) Easy to carry and operate

Disadvantages

1) Needs group cooperation and coordination

2) Requires skills in preparation and supply

3) Skills needed in presentation

PROJECTED AV AIDS

1. Motion pictures

One picture is equal to ten thousand words is the time honored generalization. If a single picture is effective of ten thousand words, pictures presented in sequence have an accumulative effectiveness which cannot be measured in terms of volumes or any other measurement. When pictures are presented in sequence at the rate of twenty four frames per second, they give the impression of motion to the human eye. For an effective use of the films made for extension programmes, knowledge about its basic information and operational skills are essential for those who use them for extension education. The basic information and skills need to be acquired are as follows: -

1. How to choose appropriate films for extension teaching?
2. How to use the motion pictures?
3. Where to use the films?
4. When to use them?
5. What are all the techniques to be learnt for operating motion picture projector?
6. To whom it shall be shown?

How to choose appropriate films?

Choosing of appropriate motion pictures for extension programme is a must for a successful message transformation. For selecting an appropriate film the following points are to be kept in mind.

i. The subject matter of the film.

ii. The length of the film, i.e. the running time of the film should be of 20 minutes to 45 minutes.

iii. Nature of the film (color films are preferred over Black and White, and sound films over silent films).

iv. The audience nature and their interest.

v. The period of time during which the film is shown. A film on post harvesting technology will be more appropriate at harvesting season than weeding time wherein a film on how to control weeds will prove to be more useful.

vi. The treatment of the message in the film.

How the message is handled by the director is more important point to be noted. The film should not give boredom to the viewers. Instead, it should be interesting, clear, and simpler to understand the hard scientific message and arouse interest of the audience.

How to use motion picture?

For an effective use of motion picture in the extension it is more important to select a proper film. It is unfair to show a film merely to say that we have showed a film in our extension programme. The film showed should have a definite subject matter or technology to be conveyed to the farmer and should explain and clarify a specific subject matter or an innovation or a technology to be adopted in the farm. Therefore, the extension agent should check through his subject matter plan before he places the date and title of his film in the audio-visual programme. He should take necessary steps to keep in possession of the film with him from the district extension directorate well in time. Check everything before showing the film. Last hour disturbances and hurried preparations will hinder an effective motion picture projection. These disturbances and shortcomings should be avoided by checking the following points.

1. Preview the film

Previewing the film is a must in order to ensure proper handling of the film. After initial preview for selection, it will be necessary only to check the film before showing the film.

2. Set up projector and screen

In most of the situations under village conditions, it will be always necessary to set up the projector and screen at a suitable place. Many times the extension worker also faces the problem to locate suitable space for audience, power supply and other essential physical facilities required for presentation of the film. The place selected should be protected from high wind and other physical disturbances. The distance between the projector and screen will be determined by the number of audience, screen type and the place chosen for projection. The projector should be placed on a four feet stand. If the stand is not available, suitable support materials such as bench, table etc., may be chosen. The speaker should be attached to the projector and placed up in front near the screen. It will be more effective and best if the speakers are kept off the floor upon a stand or table.

The screen is fixed in such a way that the bottom line of the screen is at the eye level of the seated trainees. This will provide the best vision to the audience. The portable stand type mounted screen has this feature as built-in mechanism, when a screen is not available, use a large sheet of white paper or wall or white cloth as per their availability and convenience at the place.

3. Seating arrangement

A motion picture viewed outside the sixty degree angle becomes distorted. Therefore, it is advisable to confine the seating arrangement within the 60 degree space. An area of about 20 feet distance should be provided between the screen and the first row of the audience.

4. Proper lighting

Proper darkening of the room or place of film projection is necessary.

If the situation arises to project the film on an open ground or, unclosed rooms, then it is necessary to select the time of projection in the evening after sunset. Any light rays entering into the room should be avoided. An opaque drapery material would be adequate arid would add to the attractiveness of the room. Windows shall be provided with curtain or opaque hanging materials.

5. Ventilation

Proper ventilation to the room is necessary for an effective presentation. A hot and humid room induces drowsiness and headache to the viewers. Room temperature over 70° F

or humidity over 50 per cent affects the audience adversely. This situation can be tackled by using electrical fans and suitable ventilators without allowing the light to pass on.

6. Test the projector

After setting, the projector should be tested for its proper operation and function. Film projectors are costly as well as require proper and gentle handling. Ensure proper projection before the start of the show. For a smooth operation of the projector, it is a must that the operator should be well versed with the techniques of projector operation. So, a thorough operational knowledge is a must for every extension worker.

How to operate a motion picture projector?

Even though there are many types of projectors available in the market the basic principles of operation is same and therefore a general principle of operation is given below

Mechanism of operation

In the sound motion picture projector, the film moves through the projector at the rate of twenty four frames per second. The sound track is at the edge of the film. The film when it. moves through the picture gate it is projected and when it move over the o.und drum the sound is picked up from the track: The length of the 16 mm films meant for extension use vary from 400 feet (considered as 1 reel) to 1200 feet (3 reels).

All the motion picture projectors are built-upon with three basic components such as (1) system for sound reproduction (2) image projection and (3) the film transportation mechanism to carry the film from feed reel to take up spool or reel.

1. System or Sound Reproduction

The sound reproduction system varies according to the type of sound film used. For the optical sound, the light from the exciter lamp penetrates through the optical sound track on the film to the sound drum where the photo electric cells convert the light into electrical waves. In the magnetic sound reproducer, the magnetic heads as we see in the tape recorder play back the sound recorded in the film.

The other components of the sound reproduction systems are speakers, amplifiers and controls for sound amplification.

2. Projection system

The projection system comprises of the projection lamp, optical lens, an elevator knob to raise the projector for directing the light beam and a framer to adjust the projector aperture for the projection of a complete picture on the screen.

Projection Lamps

Illumination and optical system of a motion picture projector consists of the light source the elements to concentrate the light on to the film image in the gate and the projection lens which throws the enlarged image on the screen.

Most of the film projectors use high intensity tungsten filament lamps. Light powers range from 300 to 500 watts in 8mm projectors, up to 1200 or even 1500 watts in 16mm machines. Professional motion picture projectors may have tungsten filament lamps, but the more usual light source is a carbon arc or a xenon arc. Carbon arc lamps are the most powerful illuminant, but require bulky lamp houses and feeding gear for the carbons. The high intensity xenon arc is more modern light source, nearly as intense as a carbon arc and easier to handle. Xenon arc lamps are also used on small scale projectors such as 16mm and 8mm projectors. Quartz-iodine lamps are also used in 8mm projectors and have the advantage of being particularly compact as well as providing a light of constant intensity and colour temperature.

The complete optical arrangement consists of the lamp, a reflector behind it and two or three condensers in front. The projector lamp and the reflector must be carefully lined up to illuminate the image in the projection gate evenly.

3. Film Transport system

The film transport mechanism consists of a feed reel or feeding spool which carries the film reel, a take up reel or take up spool which receives the film reel, a motor to transport the film, a control switch for the motor, toothed sprocket wheels (two) for driving the film smoothly, the guide rollers to prevent the film from sliding and rubbing over the projector components and a snubbed to prevent the film from getting strain or scratch. A film channel or gate near the aperture is the place where the light passes through the film.

Showing the film

1. Switch off the lights or darken the room.
2. Turn the projector on.
3. The adjustments to focus the film, volume and tone control for audio and frame line shall be made if necessary.
4. While the picture is projected carefully watch for any small adjustments and shut off the projector immediately if there is any fault.
5. After the picture is shown, turn off the lamp, volume to zero and when all the film. Is on the take up spool turn off the motor.

How to set up a projector and thread the film?

In the case of manual threading machines, film threading is to be done by the operator. The film loaded in the film reel has to pass through projection and audio system before it reaches the take up spool. There are certain fixed guidelines to be followed while threading a film. They are as follows

Projector arrangement

1. The projector should be fixed at the appropriate place selected for projection after deciding about its distance from the screen.
2. An elevation of about four feet is required from the ground. So it will be proper to keep it on a stand or table.
3. Connect the projector to the power supply.
4. The speaker cords are to be connected to speakers.
5. Attach the reel arms to their positions.

Threading of film

1. Turn off the motor function.
2. Hold the end of the film down from the feed reel and draw the film to the threading slot. First the film should pass under the upper guide roller and then over the upper sprocket wheel. After passing through the upper sprocket form an upper loop and insert the film into the film gate and close the gate to its position Then the film is passed through the lower sprocket wheel, sound drum bottom guide roller and snubbed before it is attached with the take up spool/reel Then rotate the spool a full clock wise turn to make it catch the film firmly on the reel. The path of the film on threading is indicated as follows

1. Feed reel
2. Upper guide roller
3. Upper sprocket
4. Film gate
5. Lower sprocket
6. Sound drum
7. Bottom guide roller
8. Snubbed and
9. Take up reel.

How to rewind the film?

In the film rewinding process, the film from the take up reel is rewound back to the feed reel. The film rewinding is done by just turning the rewind knob to its own position. In rewinding process, there is no need to thread the film through its usual direction. Instead from the take up reel, the end of the film is straight away connected to the feed reel. The following points shall be kept in mind for rewinding the film.

1. Stop the projection motor before the last bit of the film detaches from the feed reel.
2. Remove the film reel from its usual passages such as sprockets, film gate and guide rollers and establish a direct connection between the feed reels to take up reel.
3. Operate the rewinding switch to on position and 'allow the film to wind completely in the take up reel.
4. Switch off the rewind switch and projector.
5. Keep the film reel in its box and store it properly.

Motion picture

Types	:	Sound film and silent film
Sizes	:	70 mm, 35 mm, 16 mm, 8 mm and super 8.
Frames per second	:	Silent film: 18 frames/second
		Sound film: 24 frames/second.
Projection speed measurement:		400 feet is equal to I reel
Of 16 mm film.		Which runs for 11 minutes?
Use	:	Skill development, attitudinal change, informational documentary and entertainment purposes.

Special Effects In motion pictures

Slow motion

The slow motion effect is achieved by taking the motion pictures at a speed higher than normal speed and showing them at normal speed. For example, instead of taking a normal camera speed of 24 frames per second, 30 frames per second is taken and projected at the normal speed of 24 frames per second.

Animation effect

Animation is the technique of creating illusion of movement in inanimate things. With animation, puppets, figures, dolls, cartoon pictures etc., are even walking, dancing, speaking and doing at? Type of activities.

Time lapse photography

With this technique we can show sun rise, blossoming of a flower and growing of a plant within second on the screen. Here sequence of pictures of the object is taken over a period of time and later projecting them at normal speed.

Advantages of motion pictures

1. The motion pictures help to focus the audience attention and sustain their interest for a longer period than any other AV aids.
2. Increased learning through motion picture is possible. Motion pictures with planned redundancy of the message enhance the learning, process than any other visual presentation.
3. Messages of factual information's, skill performance, and attitudinal change can be better transmitted through motion pictures.
4. It helps to retain mental pictures and photographic memory of learned things.
5. Highly action oriented and emotional attachment is possible.
6. Repetition is possible any number of times.
7. Long lasting and wide coverage of audience.

Dos for using motion pictures

1. Do select the appropriate film.
2. Do decide the date, time and place of projection.

3. Do deliver a pre film lecture to prepare the audience for the contents and concepts to be discussed in the film.
4. Do prepare the equipment.
5. Do prepare the place of projection in terms of 'its physical facilities lighting, ventilation, seating etc.
6. Do well publicize the event through appropriate means so that everyone is aware of the programme time and venue.
7. Do start your projection and re-project it if it is required.
8. Do evaluate the audience 'reaction during and after the picture.
9. Do supplement the additional information through lectures.

2. Video and video production

Television is a very powerful medium of mass communication, which is used for communication, entertainment and education. Television means seen from a distance. In our country the television programmes for farmers and educational programmes are telecast from Doordarshan Kendras, spread all over the country. With satellite telecasting, majority of the rural population is covered and impact of television over the influence of attitude and practices of the farming community is tremendous. Television broadcasting was started in India in 1959 with Black and White transmission. Color transmission was introduced in 1982. Telecast of programmes can be done from pre recorded video tapes or by live broadcast. The process of recording images/pictures electronically on magnetic tape is known as video recording.

Video has gained its importance as an extension education tool for the purpose of agricultural communication. Video is widely used as it is very. Handy, less expensive, easy operation and simple to use, Wide range of extension films are available in the video cassettes which can be readily used by the extension workers. The video films on various agricultural technologies, animal husbandry practice, dairy technologies and fisheries, technologies are made by various state agricultural universiti3 and ICAR research Institutes. Video films of choice can be obtained from the directorate of extension and communication centres of these Institutes.

Video recording has been in existence since 1956. Earlier two inches and one inch wide tapes were used for recording black and white pictures. Portable 1/2 inch recorders were introduced in 1967. In 1972, Sony company Japan introduced u-matic video recorders which were capable of recording color video images on 3/4 inch tape. These recorders used video tapes housed in cassettes, instead of reels, thus making it very convenient to handle the tapes. These recorders were known a video cassette-recorders or VCRs. By 1978, 1/2 inch color VCRs and cameras were introduced. Tape formats extensively used at present are: i) u - matic (3/4 inch) 2) Video Home system (VHS), Super vits, Beta max and Betacam (all 1/2 inch system). 3) Video - 8 and Hi - 8 (8 mm tapes).

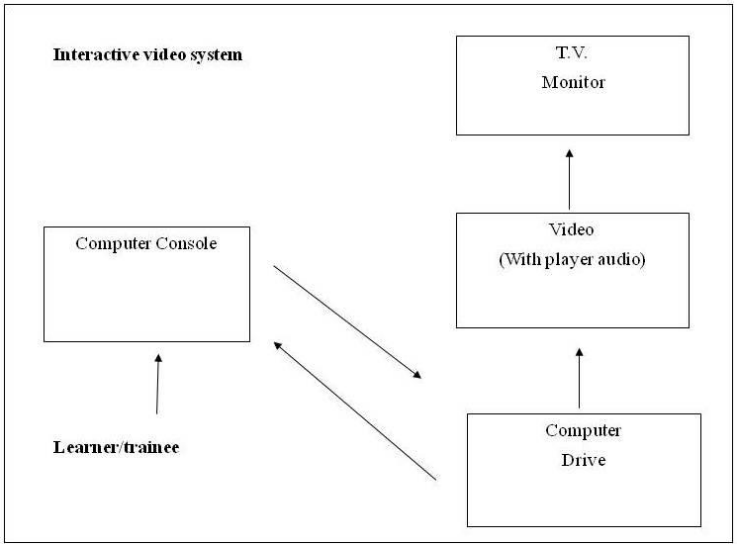
Color television broadcasting systems vary from country to country. In India, the system used is known as P.A.L. (Phase Alteration-line). The other systems widely prevalent are N.T.S.C. (National Television Standard Committee) and S.E.C.A.M. (Systems Couleurs A Memoire). These three basic systems or slightly modified forms of these systems are used in different parts of the world. A tape recorded on one system cannot be played on a VCR of another system. A PAL recording, for example can be played only on a PAL recorder/ player and not on a NTSC or SECAM recorder.

Video is a magnetic and electronic process. The video film is based on the principle of persistence of vision of the human eye. This principle of persistence of vision is used to give an illusion of movement. On film 24 frames containing different phases of action are photographed and projected per second. Video tape moves continuously around a magnetic drum rotating 25 times per second (in PAL) in recording/playback modes to give 25 frames of action per second.

Interactive Video

It is a self styled learning system which can be used to train the extension workers and students of extension education programmes. The interactive video programme is based on the use of computer, video cassette recorder, television and monitor with a key board. The video disk player gives the input to the television monitor which displaces the picture and sound the computer console connected to a computer with the floppy disk drive possessing the required software system gives the operational input to the learner or trainee to study the things, via his console. Since, the video disk is connected with the computer; the video output is controlled

by the computer. The learner at the console gives his command or starts his learning activity through the introductions via key board and computer console. Thus a network is formed and the learning is assisted by computer via video interaction. Since the video interacts with the learner, with the help of computer based commands it is popularly known as interactive video method of learning.



Interactive video

Video tape

A video tape consists of

1) A video track to show the video record

3) An audio track to record and reproduce the sound.

3) A control track to monitor the tape movement.

Video camera

The video camera is an instrument used to record the picture on the video tape. The video camera changes the light or picture or an object into an electronic signal. This conversion is done by the light sensitive device camera tube or C.C.D. (change coupled device) which scans the image over 625 lines and 25 times a second (in P.A.L. system). From video camera, video signal is carried by a cable to video recorder (VCR) where the signal is recorded on a magnetic video tapes running in them.

Video production

Video production is a creative effort which requires an elaborate planning and vision. Preparation of a detailed script is necessary for video production; once the script is ready, then video shooting and editing are the next steps. The video script consists of the elaboration of video and audio components. It is the preplan which elaborates the details to be included in each frame. How many seconds a particular scene is shown, type of shot, whether it is a long, medium or close up shot, what to be shown, whom to be shown, format, visuals, audio another minor details of a scene to be shot are to be decided. While shooting, it is not necessary to shoot in the order in which the script is written. Normally, all the visuals of a particular location (say indoor or outdoor) are shot at one stretch. While shooting different scenes, attention is paid to retain continuity of the shot. It is desirable to have a variety of shots, one shot following the other smoothly so that fluidity in narration can be achieved. In video programme production, number of cameras is employed for giving different angles and points of view of the scene being recorded. A switcher enables selection of a particular camera output to be recorded. The microphone system is used to pickup sound signals from different points. All the microphone outputs are connected ‘to equipment known as audio mixer where the inputs are controlled to provide a uniform quality.

Activities Involved In Video Tape Production

(A) Preshooting

Conceptualizing:

1. Finalizing concept
2. Determining target audience
3. Determining what message we are trying to communicate.

(B) Survey and Research

1. Collection of Background information:

i. Documents, literature, published/unpublished material collection and study.

ii. Interviewing connected and experienced persons in the field

iii. Interviewing officials

iv. Interviewing persons actually involved including the beneficiaries.

(C) Scripting

1. Formulation of Outline of the film.

2. Preparation of rough treatment and amending it after discussions.
3. Preparing a final treatment
4. Preparing 'Zero' draft of script
5. Revising the script after discussions.
6. Visiting locations/possible locations, including other industries
7. Preparing final script after finalizing locations.
8. Pretest the script with target audience.
9. Identifying visuals to be incorporated
10. Preparing a "Story board" script and revising it after discussions.

(D) Preparations

a. Planning for location shooting
b. Planning for studio shooting
c. Planning for graphics shooting
d. Planning for recording of music including signature tune/title music
e. Planning for recording voice over/dubbing

(E) Survey and Research

1. Going to location with equipment
2. Video recording of raw stock
3. Reviewing the rushes
4. Reshooting shots/sequences which may not be up to the mark.
5. Recording of sound tracks
6. Recording of voice over/commentary
7. Recording of music including signature tune
8. Video Recording in the studio
9. Video Recording of graphics, titles and credits.

(F) Post Shooting

1. Preparing an edit script
2. Planning and organising editing
3. Assemble/insert editing
4. Recording music on second track
5. Recording voice over/commentary.

6. Dubbing regional language commentary/voice over
7. Preparing an edited final copy (original)
8. Producing more copies by recording from original Testing the film on target audience and obtaining feedback for incorporating and improving the next film.

Video Editing

After the programme is 'shot' (recorded) it is edited. The purpose of editing is to make the programme crisp by eliminating unwanted portions. At the editing stage, the materials shot are assembled in an orderly manner to have smooth flow and also to have the desired effect. The 'pace' of the video is controlled at this stage. Editing is done by re-recording the desired portions, along with addition of sound effects on another tape. Additional visuals like other video recordings, captions, titles, photographs, tables, can be added at this stage. The sequence of the scenes are determined and finalized at this stage.

Educational Video programmes

Video tapes have proved to be of immense use in training and education. The potentials are vast and it is limited only by our creative vision. The ability of video to bridge the space and time has given television a unique place in modern communication. For educational programmes, both indoor and outdoor recording are required. Complete outdoor video programmes can also be made. In educational video programme the 'Voice Over' technique can be employed, where a commentator speaks the commentary to match with the visuals. To prepare high quality educational programmes, a pre-visualised description of the visual and aural elements i.e. 'a script' is necessary. Visual elements include camera compositions such as shot length, camera movements such as plan, tilt, zoom, dolly-in, dolly out etc. and mood of the scene; high key, low key, colors, etc. Aural elements include dialogues, sound effects, music, songs, rerecording etc.

Operational Tips for Video recording

The following step wise procedure shall be kept in mind while starting a video production.

- Position the camera at its angle.
- Connect the camera output to video recorder input and microphone output to the audio recording input.
- Insert the video tape inside the recorder.

- Lighting arrangement is to be checked and light the necessary focus lights for proper lighting effect.
- Now, position the camera and view through it to check the angle and adjust it to the shot requirement.
- Focus the camera, adjust the monitor brightness and contrast controls.
- Set right the audio recording level to its optimum.
- Set the index counter to zero.
- Give instruction to the programmer and artists.
- Ready, start the camera and record the scene.
- On completing the recordings rewinds the tape and see how the shot has come up. Reshoot it if it has not come to the satisfaction.
- After completing all the shots, edit it for smoothness and sequence.

ADVANCES IN AUDIO – VISUAL AIDS

1. **LCD projector**

An **LCD projector** is a type of video projector for displaying video, images or computer data on a screen or other flat surface. It is a modern equivalent of the slide projector or overhead projector. To display images, LCD (liquid-crystal display) projectors typically send light from a metal-halide lamp through a prism or series of dichroic filters that separates light to three polysilicon panels – one each for the red, green and blue components of the video signal. As polarized light passes through the panels (combination of polarizer, LCD panel and analyzer), individual pixels can be opened to allow light to pass or closed to block the light. The combination of open and closed pixels can produce a wide range of colors and shades in the projected image.

Metal-halide lamps are used because they output an ideal color temperature and a broad spectrum of color. These lamps also have the ability to produce an extremely large amount of light within a small area; current projectors average about 2,000 to 15,000 American National Standards Institute (ANSI) lumens.

Other technologies, such as Digital Light Processing (DLP) and liquid crystal on silicon (LCOS) are also becoming more popular in modestly priced video projection.

Projection surfaces

Because they use small lamps and the ability to project an image on any flat surface, LCD projectors tend to be smaller and more portable than some other types of projection systems. Even so, the best image quality is found using a blank white, grey, or black (which blocks reflected ambient light) surface, so dedicated projection screens are often used.

Perceived color in a projected image is a factor of both projection surface and projector quality. Since white is more of a neutral color, white surfaces are best suited for natural color tones; as such, white projection surfaces are more common in most business and school presentation environments.

However, darkest black in a projected image is dependent on how dark the screen is. Because of this, some presenters and presentation-space planners prefer gray screens, which create higher-perceived contrast. The trade-off is that darker backgrounds can throw off color

tones. Color problems can sometimes be adjusted through the projector settings, but may not be as accurate as they would on a white background.

Using LCD Projectors

In the ever growing world of technology, the popularity of computers to generate presentations is growing. Today's laptop computers coupled with many of the common software packages offer flexibility to the presenter. A professional looking presentation can be prepared ahead of time and displayed using this exciting technology. The use of this technology can be very attractive, especially to professional speakers who travel with a laptop computer.

The limitations of LCD technology is that the equipment can be very expensive with systems ranging from a few thousand dollars to systems which can run $25,000 or more depending on the features and options of the display projector. It does require the use of a computer and the necessary technical interfaces to work properly. Significant preparation is required to assure that everything is working properly.

Here are some tips to consider when using LCD display projectors

1. **Read the LCD projector manual on its proper operation** Not all LCD projectors work the same and each has their own unique operating requirements. Become very familiar with the projector BEFORE using it during your actual presentation. Make sure your computer can be properly interfaced with the LCD projector.

2. **Practice setting the equipment up several times** - Spend some time making sure you know how to properly set up the LCD projector with your computer and other computers. Set up the LCD projector in the actual presentation environment you will be using, if possible.

3. **Set up well in advance** - Allow yourself plenty of time to set up your computer and the LCD projector. Check any last minute details.

4. **Check the LCD projector bulb life**- LCD projector bulbs do have limited life. Some bulbs have shorter lives than others. Check and make sure the bulb you will be using is not close to the end of its life.

5. **Bring a spare bulb and cables!** - Always carry spare bulbs with you and make sure you know how to properly change the bulb. Also, remember, "Hot" glass looks like "Cold" glass; be careful and bring a towel or glove to use when changing the bulb. Practice changing the bulb during one of your practice sessions.

6. **Check your presentation color combinations** - Take some time to check out the actual presentation for the color combinations you will be using. Some colors and color combinations do not project well.

7. **Check the font size you are using** - Nothing is more frustrating to an audience than text that cannot be easily seen or read. Make sure you are using the proper text size for the distance you will be projecting your slides.

As with any sophisticated piece of equipment, it is critical that you familiarize yourself with the proper setup and operation of the equipment well in advance of your actual presentation. Remember, the more technology you bring to your presentation, the more care and time you need to include during your preparation stage. If everything is well planned, properly checked out and you have properly rehearsed with this new equipment, it can add a lot of excitement and life to your presentations.

2.K-Yan

K-Yan All-in-One Device is a very innovative invention that takes learning to a whole new level. Just imagine having a multimedia computer, large format flat television, DVD/ VCD/ CD player, CD writer, projector, Internet, Video conferencing and Visual Audio System in just a single, easy to carry equipment. This is the power of K-Yan All-in-One Device. Vinea Distribution Inc. (VDI) conducted a soft launch of K-Yan in the Philippines, May 5 at Max's Glorietta 3. Present at the event were various resellers as well as bloggers. Manas "Manny" Arora, IL&FS Business Development Manager conducted a live presentation and demonstration of the product.

K-yan has been developed by IL&FS ETS in collaboration with IIT, Bombay, to meet the urgent need for a low-cost new media product, specially designed for group learning in schools and other learning communities. "This machine combines a projector, a high-end personal computer, an interactive whiteboard and more into one machine. It is a highly

efficient device which can performs well even in extreme conditions such as lack of air-conditioning or even in dusty areas.

3. **Interactive whiteboard**

An interactive whiteboard is an instructional tool that allows computer images to be displayed onto a board using a digital projector. The instructor can then manipulate the elements on the board by using his finger as a mouse, directly on the screen. Items can be dragged, clicked and copied and the lecturer can handwrite notes, which can be transformed into text and saved. They are a powerful tool in the classroom adding interactivity and collaboration, allowing the integration of media content into the lecture and supporting collaborative learning. Used innovatively they create a wide range of learning opportunities.

An interactive whiteboard can be a cost saver as this technology demonstrates how one computer can provide learning stimuli for a whole classroom. This is more cost effective than equipping an entire IT room, or every student with a laptop.

Examples of the features available when using an interactive whiteboard

- Add annotations Highlight text
- Add notes and drawings and then save them to be printed out and shared
- Show pictures and educational videos to the whole lecture theatre.

- Demonstrate the content available on a website in a teacher-directed activity

SMART Board Interactive whiteboard

- Screen shade
- Spotlight
- Magnifier
- Calculator

Interactive whiteboards as a pedagogical tool

This type of tool promotes creative teaching and motivates students into absorbing information. Teaching with an interactive whiteboard allows lecturers to accommodate all different learning styles.

- Tactile learners get to touch and move things around the board.
- They can also make notes and highlight elements.

Visual learners benefit from a clear view of what is happening on the board. Audio learners can participate in a class discussion.

Interactive teaching

The teacher can call upon the students to interact with the whiteboard themselves. The lecturer can sit at the computer, with the student at the whiteboard, and the class offering suggestions and contributing ideas.

Group interaction

Interactive whiteboards promotes group discussion and participation. They are an effective tool for brainstorming as notes made on the screen can be turned into text, and saved to be shared and distributed later. They are an ideal tool for small group work and collaborative learning, as students can huddle around the board developing ideas, and then save the work for sharing over a network or by email.

Advantages

- Whiteboard ink markings are less susceptible to external factors, such as water, because the ink adheres in a different manner than chalk does to chalkboards. Using markers

does not generate the dust that comes from using and erasing chalk, allowing their use in areas containing dust-sensitive equipment.

- A whiteboard can be used as the projecting medium for an overhead or video projector. This allows the person giving the presentation to fill in blanks, edit, and underline and make comments by writing directly onto the whiteboard, which in turn shows through the projected image.

- Like chalkboards, whiteboards help to save paper.

- When compared to a chalkboard a whiteboard can have significantly more colors because markers have a greater range of color than chalk (sidewalk chalk).

Disadvantages

- Only special whiteboard markers are suitable for use on whiteboards. Using other markers that resemble whiteboard markers but contain the wrong kind of ink creates markings that are hard or impossible to remove, depending on the surface type.

- The white background can cause contrast problems for people with vision impairment. Additionally, whiteboards cause some problems for those who write left-handed as many write with their hand curved around the pen, therefore causing their hand to drag across the board, smearing the marker strokes previously made. Similarly, right-handed people have this problem with right-to-left languages, such as Arabic. This limitation is also present with a chalkboard.

- Another disadvantage of the whiteboard is concerned with the issues of the actual usable ink remaining in a dry-erase marker. Since the markers are often tightly sealed in plastic, it is not possible to accurately gauge the amount of ink available. In contrast, blackboards, using chalk do not have this problem as the chalk visibly reduces with use. Chalk also creates markings of equal intensity throughout its lifetime whereas whiteboard markers begin to fade in intensity almost immediately after first use.

LECTURE –10

e-Extension-Internet, video and teleconferencing, Interactive Multimedia Compact disc (IMCD)

E-Extension

E-Extension is also known as **cyber extension**. It is defined as the '**extension over cyber space**'. But, in applied context of agriculture, cyber extension means, "using the power of online networks, computer communications & digital interactive multi-media to facilitate dissemination of Agrl. Technology". It includes effective use of ICT, national & international information networks, internet, expert systems, multi-media learning systems & computer based training systems to improve information access to the farmers, extension workers, research scientists and extension managers.

Need for E-Extension

- To accelerate agricultural growth
- To expand knowledge resource
- To facilitate better information access
- To supplement inadequate technical manpower
- 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

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. Here, **Network** means it is a group of computers connected mutually for exchanging information and sharing equipments. Major goal of networking are

- To facilitate communication among users connected to host (server)
- To spread information across the entire world
- To facilitate resource sharing

Network

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'.

Different types of machines or networks that are a part of internet have to speak the 'same language' (software) to communicate and exchange information. Conventional means of communication were mailing letters, telephone and meetings / discussion. Thus, internet is a network of networks connected through different types of communication channel to communicate irrespective of distance and time.

Types of Networks

On the basis of Geographical area they are classified into

LAN - Local area network

WAN – Wide area network.

LAN: These are small networks of computers which span in small geographical area, generally within 1-5 km of range. Ex: Network in an office or within a building.

WAN: These are very large networks of computers and span large geographical areas, generally covering a couple of miles, sometimes connecting computers thousands of miles apart and worldwide.

Benefits and or purposes of Internet:

1. Education: Can get additional Information by the students, teachers and scientists. It is a medium for interactive and collaborative learning. Useful for distance education.
2. Publishing: All newspapers and newsletters are available on internet.
3. Shopping: E-commerce is possible
4. Advertising: Useful for advertising the products with text, graphics and pictures and video clippings.
5. Financial services: Stock broking and research reports on stocks are available and can be downloaded. The transactions like tele credit card checking, tele banking, tele insurance are taking place.
6. The business of 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. E.g., E –seva in AP
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 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.

The mail programme is loaded with windows is Outlook Express. It helps use to send, receive and store e mails.

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

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

Teleconferencing

Basically 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.

1. Audio Conferencing

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. This is called audio teleconferencing.

2. 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. It is also known as video conferencing. 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.

Advantages

- Students from each campus build up a strong rapport with each other
- Involving pioneering education work and a shared experience to the tutors at two campuses

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.

Advantages

Teleconferencing has serveral advantages over conventional training methods which are given below:

(i) Reduce time and resource requirements

The cost of training can be reduced due to following reasons:

a. Higher trainee-to-trainer ratio

- One trainer can teach any number of trainees at the same time
- The trainer serves as a facilitator assisting trainees when needed
- Save trainer's time
- Reduce and eliminate travel-trainees can be trained in the work place

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.

Teleconferencing

This involves multiple interconnected telephones/PCs. Each person can hear and talk to all of the others involved in the call. 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. It requires a central unit known as an audio bridge which provides the necessary support to set up a conference call automatically.

CD-ROMs

- 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.

Interactive computer video technology

- One of the most popular multimedia technologies that has been used in ICVT, It 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.

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.
- The cost of multimedia is probably the biggest issue that will be raised. However the cost drops. Proportionately as the number of users get increased.

IMCD

- Interactive multimedia compact disc (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.

Multimedia communication is the representation, storage, retrieval and dissemination of machine processable information expressed in multimedia such as text, voice, image, audio and video.

LECTURE –11

Agri portals, Information kiosks, Kisan Call Centre (KCC)

Portal: 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:
(1) search engine(s)
(2) email
(3) links to other related sites, and
(4) personalized content.
It may also provide other facilities such as chat, members list, free downloads, etc.

Agri Portals

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.

Importance of 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.

Agri Portal: Language: English and tamil

- http://agritech.tnau.ac.in
- Krishi.net http://www.krishi.net
- .http://agropedia.iitk.ac.in

Cybercafes / 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 e. g., in Acharya N. G. Ranga Agricultural University, the information kiosks were installed at modern agricultural information center and at Agricultural Technology Information Center (ATIC) with touch screen operation. 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. 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.

Kisan Call Center

The Department of Agriculture & Cooperation (DAC), Ministry of Agriculture, Govt. of India launched Kisan Call Centers on January 21, 2004 across the country to deliver extension services to the farming community.

The purpose of these call centers is to respond to issues raised by farmers, instantly, in the local language. There are call centers for every state which are expected to handle traffic from any part of the country. Queries related to agriculture and allied sectors are being addressed through these call centers.

A farmer from any part of the State can contact the Kisan Call Centre by dialing the toll free Telephone No. **1551 or 1800-180-1551** and present their problems/queries related to farming. The operator at the Kisan Call centre will attempt to answer the problems/queries of the farmers immediately. In case the operator at the Call Centre is not able to address the farmer's query immediately, the call will be forwarded to identify agricultural specialists.

Concept of Kisan Call Center

The challenges before Indian Agriculture are immense. This sector needs to grow at a faster rate than in the past to allow for higher per capita income and consumption. It is an accepted fact that the sound agricultural development is essential for the overall economic progress. About two thirds of workforce directly or indirectly dependent on agriculture, this sector generates about 28 percent of its GDP and over 15 percent of exports. Rising consumer prosperity and the search by farmers for higher incomes will simultaneously drive crop diversification. Export opportunities for agricultural products are also expected to continue to grow, provided India could meet the stability, quality and presentation standards demanded by foreign trade and consumers and maintain its comparative advantage as a relatively low cost producer.

Given its range of agro-ecological setting and producers, Indian Agriculture is faced with a great diversity of needs, opportunities and prospects. The well endowed irrigated areas which account for 37 percent of the country's cultivated land currently contribute about 55 percent of agricultural production, whereas, rainfed agriculture which covers 63 percent accounts for only 45 percent of agricultural production. In these less favorable areas, yields are not only low but also highly unstable and technology transfer gaps are much wider as compared to those in irrigated areas.

If it is to respond successfully to these challenges, greater attention will have to be paid to information-based technologies. Strengthened means of dissemination will be needed to transmit this information to farmers. Both technology generation and transfer will have to focus more strongly than ever before on the themes of optimization in the management of their available resources by producers, sustainability, coping with diversity by adapting technology more specifically to agro-ecological or social circumstances and raising the

economic efficiency of agriculture. To make information transfer more effective, greater use will need to be made of modern information technology and communication among researchers, extensionists and farmers.

Public extension system requires a paradigm shift from top-down, blanket dissemination of technological packages, towards providing producers with the knowledge and understanding with which they solve their own location - specific problems. Continuous two-way interaction among the farmers and agricultural scientists is the most critical component of Agricultural Extension.

At present, the issues have been addressed by the Extension Systems of State Departments of Agriculture, State Agricultural Universities (SAUs), KVKs, NGOs, Private Extension Services through various extension approaches in transfer of technology. A limitation in Transfer of Technology (TOT) model continues to remain a challenge for the public and private extension systems. With the availability of telephone and Internet, it is now possible to bridge this gap to quite a large extent by using an appropriate mix of technologies.

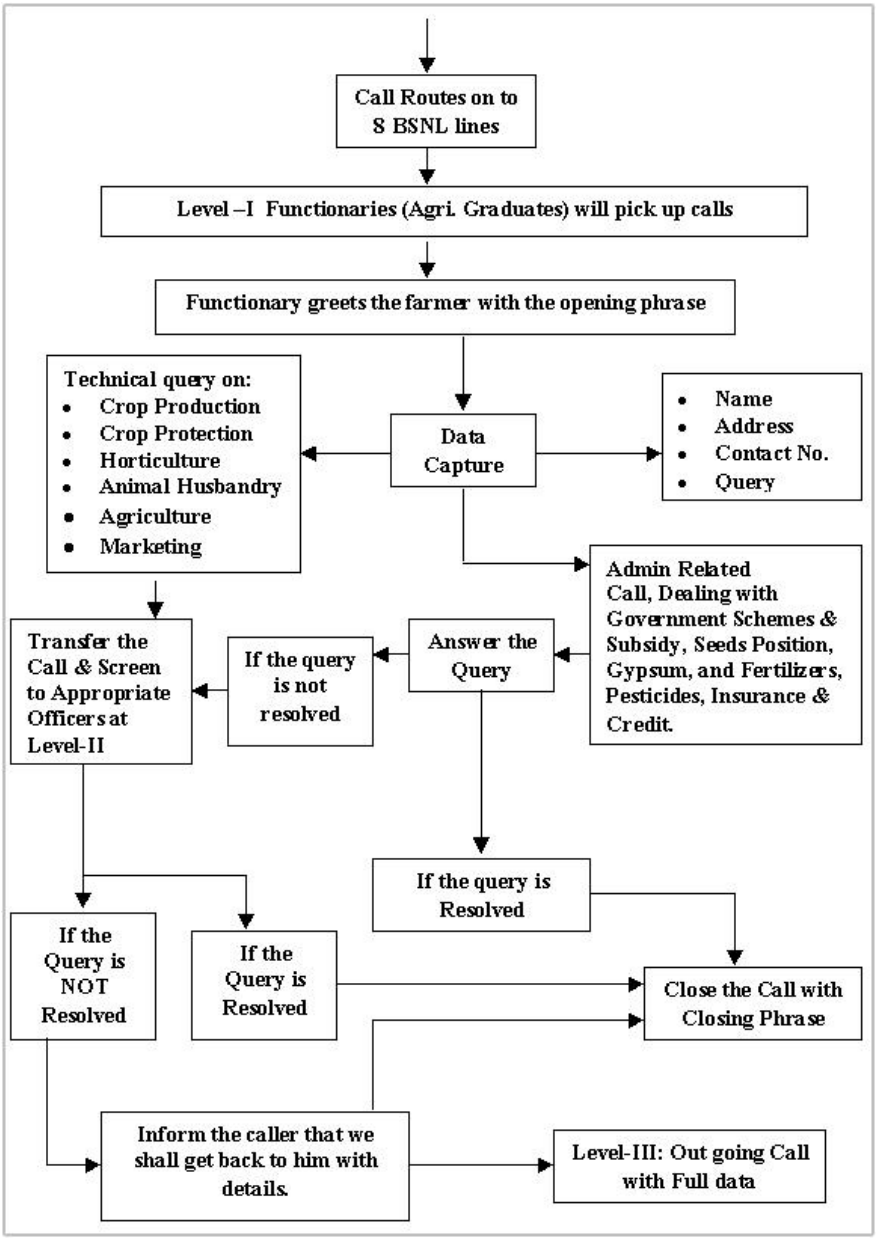
Operational Mechanism

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 namely Agricultural Scientists, Extension Functionaries, Farmers and Marketing Agencies.



The Kisan Call Center is a synthesis of two hitherto separate technologies namely, the Information & Communication Technology (ICT) and the Agricultural Technology. Both have their specialized domains and work cultures. To optimally utilize the strengths of both these systems, it was proposed to take full advantage of professionally managed Call Centre mechanism and dovetail it with the specialized Subject Matter Specialists knowledge of Agricultural Scientists and Extension Officers, so as to facilitate its reach to the farming community. It is accordingly proposed to make use of existing specialized infrastructure of Call Centers (which are normally industry-driven and serve to high-end and many a times, mission critical service sector) and make this communication backbone available to the

Subject Matter Specialists of Agriculture, Horticulture, Animal Husbandry, Marketing and other related areas. The Kisan Call Center, consists of three levels namely Level-I (the basic Call Center interface, with high quality bandwidth and local language proficient Agriculture Graduate), Level-II (Subject Matter Specialists on concerned important crops and enterprises, connected through good bandwidth telecom and computer connectivity) and Level-III (the Management Group to ensure ultimate answering and resolution of all the farmers queries which are not resolved at Level-II, connected on off line mode).

Level - I: The call coming to the call center is picked up by an operator (level I functionary) who after a short welcome message takes down the basic information and the query of the caller. These details are fed into a computer located next to the operator by the operator himself. And the first level receiver of the call would also feeds into the computer the question being asked by the farmer.

The first level operators preferably would be an agricultural graduate with rural background knowing local language. They should also possess good communication skills. They would be in a position to answer a majority of the questions likely to be asked by the farmers.

Level - II: The level -II consists of Subject Matter Specialists (SMS) who are located at their respective place (Research Stations, ATICs, KVKs, Agricultural colleges),of work. In case the first level operator is not able to answer the question, the operator forwards (in call sharing mode) the call to the concerned Subject Matter Specialist. 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.

While selecting the specialists, it would be important to first identify the major crops in that state and the issues on which the questions are likely to be asked. These specialists should be such that they will answer most of the questions that are likely to be asked. There could be two options available on the selections of the specialists.

One option could be to select commodity wise specialist, that is, every question related to a particular crop or commodity would be directed to that specialist, who would in turn answer that question. Other option could be to select general specialists who would deal with various subjects likely to arise. The specialists should ideally be located within a city. They should have good communication skills and should know the local language. These specialists should have at least a minimum of 10-15 years of field experience in their respective specialization.

Level - III: The level - III consists of a dedicated cell located at the Nodal Office. This would receive the questions that have not been answered at the first and the second levels. Appropriate replies to these questions would be then framed in consultation with the concerned specialists available within or outside the State, by the nodal cell. The replies would be sent to the farmers promptly by post/e-mail/fax/ telephone etc. within 72 hours of receipt of the question.

Infrastructure

The Kisan Call Center infrastructure is placed at three locations namely -

1. A professionally managed Call Center (Level-I)
2. A Response Center in each organization, where services of Subject Matter. Specialists are made available (Level-II)
3. The Nodal Cell (Level-III)

Infrastructure at Level-I

The technical infrastructure at Level-I is the most critical and complex. The farmers call lands on a switch in BSNL and the same is transferred to one of the 8 hunting lines (on first come first serve basis) at the Call Center premises. Here there will be two Agriculture Graduates picking up these calls and capturing data.

To facilitate this, the hunting lines will have interface with Local Area Network (LAN) at the premises of a Call Center. Two nodes of LAN (with two computers, two telephones with head phones and tele-conferencing facility, support of the server and Internet connectivity) will be dedicated to Kisan Call Center. The entire backup support system

consisting of Uninterrupted Power Supply (for both server and the nodes), Air-conditioning System and other logistics will be made available by the Call Center. The responsibility of the Nodal Officer is to see that two Agriculture Graduates are placed to serve as Level-I functionaries as Agri-communicators at the identified Call Center. The whole technical infrastructure at Level-I (including dedicated line with a toll free number identified by Ministry of Agriculture, Govt. of India) will be owned and maintained by Call Center Management.

Infrastructure at Level-II

It is proposed to have a Response Center in the working territory of each Institution or Agency, who will provide services of Level-II functionaries. The basic infrastructure at Level-II includes a dedicated high bandwidth telephone line (preferably 128 kbps ISDN line), a Desktop Computer System with Internet connectivity, one printer and a 2 KVA UPS system and appropriate logistic support in terms of an exclusive room with air-conditioning. This will be organized by the Nodal Agency at the identified resource institutions.

Infrastructure at Level-III

The Level-III operations will be managed at the identified Nodal institutions. The basic infrastructure at Level-III will include a dedicated high bandwidth telephone line (preferably 128 kbps ISDN line), a Desktop Computer System with Internet connectivity, one printer and a 2 KVA UPS system and appropriate logistic support. The Level-III is supposed to be manned by a Senior Officer from the Nodal Institution. The infrastructure will also include appropriate software for analysis of call data and reporting mechanism (with provision for daily, weekly and monthly reporting systems with support on crop / enterprise wise, region wise and issue wise reports). This system demands a support of an ICT Facilitator of the Nodal Institution to continually support proper logging, analysis, documentation and reporting at Level-III. This will be organized by the Nodal Institution at the own premises.

Skills required at different levels in Kisan Call Centres

(a) Facilitation Skills: When a call received at the Level-I and Level-II, the receivers welcome the caller by Greetings• and facilitate him in presenting the problem in a focused way by giving a lead to his query in the following way:

- Speak in Farmer's language
- Use Easy words
- Use short sentences
- Give patient listening to understand the local conditions and Farmer's situation for the query he raises.
- Diagnose the problem by probing the details.
- Answering the query at the level of farmer's knowledge.

(b) Communication Skills

- Empathise with the farmer
- Listen actively for content and feeling
- Exhibit commitment and interest to convince the farmer
- Avoid defensiveness in conversation.
- Use personal words in conversation
- Relate with local experiences, if possible.
- Avoid use of unnecessary and complex words and sentences.
- Smooth transition in voice.
- Speak politely.
- Close call with greetings.

(c) Computer Skills

- Basic knowledge of key board and mouse.
- Basic knowledge of Internet.
- Sending and Receiving E-mails.

Monitoring and Review

For successful functioning of Kisan Call Centers, there is a need to monitor and review the various activities of the KCC by the Nodal Institution on regular basis. The Nodal

Institution is responsible for documenting the daily activities of the Kisan Call Center at various levels on farmer's queries and their resolution, availability of Subject Matter Specialists, call dropouts and their transfer to Level-III and response to the farmers within 72 hours. The Nodal Institution will also organize fortnightly meetings with the Heads of Departments of Response Centers for first 6 months to ensure the proper identification and placement and changes if necessary of Level-II functionaries and resolution of the queries shared with Subject Matter Specialists and their documentation. Subsequently, these meetings will be held every month in Response Centers on rotation.

The Department of Agriculture & Cooperation (DAC), Ministry of Agriculture (MOA), Govt. of India will review the functioning of all the Kisan Call Centers with the Heads of Nodal Institutions every month to start with for first six months and subsequently for every quarter in each of the Nodal Institution on rotation basis.

Documentation and Reporting

The Nodal Institution is responsible for documentation and reporting. The Officer In-charge of the Nodal Institution will gather the reports from the Kisan Call Center / Response Centers and prepare a consolidated statement on farmers queries and answers, crop / enterprise-wise, along with the resolutions given at Level-III and report to the Department of Agriculture & Cooperation (DAC), Ministry of Agriculture (MOA), Govt. of India through e-mail on fortnightly basis.

All the proceedings of the Kisan Call Center will be documented by each of the Nodal Institution and shared with other Kisan Call Centers for preparing a database on crop / enterprise-wise and also to prepare Frequently Asked Questions (FAQs).

LECTURE –12

Mobile phone, Expert System, Village Knowledge Centre (VKC), DEMIC

Mobile for Agricultural extension

Mobile phones significantly have reduced communication and information costs for the rural people. 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. Similarly, use of ICTs in agricultural extension services especially mobile phone services in the agricultural sector has provided information on market, weather, transport and agricultural techniques to contact with concern agencies and department (Aker, 2011).

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. However, short message service SMS and voice record have given improvements in social relations. Mobile phone based social networking in the developing countries goes to show the growing importance of this aspect Mobile phones are considered as important for agriculture development. This technology has provided connectivity and offer benefits such as mobility and security to owners (Bayes et al., 1999, Goodman, 2005, Kwaku & Kweku 2006, Donner, 2006).

1. AGRIFONE

AgriFone is an application developed for agriculture sector by a third Party. It addresses the needs of farmers, agricultural workers, agribusinesses and input suppliers. It provides convenient and easy-to-use tools for farmers on cheap mobile phones. Unique feature of AgriFone is one-to-one, one-to-many and peer-to-peer exchange of text, voice and images amongst mobile subscribers. This application was used in Maharashtra/India. AgriFone is not used commercially.

2. mKRISHI

mKrishi is a joint platform integrating different stakeholders in provisioning agriculture services in local language. Farmers can send queries to agriculture experts and

receive replies in personalized or relevant form. It was used in India. This is a proprietary solution.

3.0700 INTERACTIVE VOICE RESPONSE SERVICE (IVR)

0700 an Interactive Voice Response service (IVR) provides agriculture related information and was launched by Mobilink, Telenor, Ufone and Zong to target rural customers in Pakistan. This service is launched only to facilitate farmer community but was not able to generate sizeable revenue therefore this service is currently discontinued.

4. **ESOKO (ESOKO, 2011)**

ESOKO is mobile based system developed for sending SMS to farmers to provide them agricultural information. This application was used in Afghanistan, Tanzania, Mozambique, Madagascar, Uganda, Nigeria, Cameroon, Ghana, Ivory Coast, Mali, Burkina Faso, Benin, and Togo.

5. E-ARIK

The E-Arik project established a 'Village Knowledge Centre' with computer, internet link, printer, scanner, phone and TV at Yagrung village. Project facilitators (agricultural professionals, a computer instructor and farmer facilitators) were appointed at the Centre to help farmers access ICT based agricultural information. E-Arik is made for the farmers of a village in India.

Agriculture Mobile Application

Kisan Suvidha

Kisan Suvidha is an omnibus mobile app developed to help farmers by providing relevant information to them quickly. With click of a button, they can get the information on weather of current day and next 5 days, dealers, market prices, agro advisories, plant protection, IPM Practices etc. Unique features like extreme weather alerts and market prices of commodity in nearest area and the maximum price in state as well as India have been added to empower farmers in the best possible manner.

Pusa Krishi

ZTM&BPD Unit; ICAR-IARI, New Delhi is leading 14 ICAR institutes of North Zone-I. The unit strives to be a strong link between the research community and the outside world. It promotes Agribusiness Ventures through technology development and commercialization for everyone from a corporate to an individual farmer. We have a variety of technologies / products for commercialization. Some technologies may be market ready, however some may require validation and some may require up scaling. We license our technologies to both private and public sectors.

MKisan Application

This app has been designed and developed by inhouse IT team of DAC with the help of C-DAC Pune. It enables farmers and all other stakeholders to obtain advisories and information being sent by experts and government officials at different levels through mkisan portal without registering on the portal.

Shetkari Masik Android App

"Shetkari Masik" is one of the most popular monthly magazines in the Agriculture sector, under publication since 1965. It is published by Department of Agriculture, Maharashtra. The Android app for Shetkari magazine has a very simple interface and requires mobile internet or Wi-Fi connectivity to register and download the issues. Once downloaded, the magazine can be read without internet connectivity.

Farm-o-pedia

Developed by CDAC, Mumbai. The application is a multilingual Android application targeted for rural Gujarat. The app is useful for farmers or anyone related to agriculture. It is available in English and Gujarati languages.

The main functionalities of the app are

- Get suitable crops as per soil and season
- Get crop wise information
- Check weather in your area
- Manage your cattle

Bhuvan Hailstorm App

A mobile app has been developed to capture crop loss happened due to hailstorm. Agriculture Officer will go to the field with mobile or tablet loaded with this mobile app. This mobile app is able to capture following parameters.

- Photograph of field with latitude and longitude.
- Name of Crop
- Date of sowing
- Date of likely harvesting
- Source of irrigation

This captured data will automatically be plotted to Bhuvan Portal and analysis can be done easily.

Crop Insurance mobile app

Crop Insurance mobile app can be used to calculate the Insurance Premium for notified crops based on area, coverage amount and loan amount in case of loan farmer. It can also be used to get details of normal sum insured, extended sum insured, premium details and subsidy information of any notified crop in any notified area.

AgriMarket

AgriMarket mobile app can be used to get the market price of crops in the markets within 50 km of the device's location. This app automatically captures the location of person using mobile GPS and fetches the market price of crops in those markets which falls within the range of 50 km. There is another option to get price of any market and any crop in case person does not want to use GPS location.

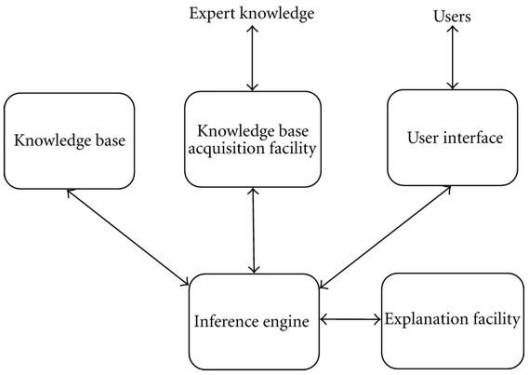
Expert Systems

Artificial intelligence (AI) is defined as computers with the ability to mimic or duplicate the functions of the human brain. AI is the study and creation of computer systems that can perceive reason and act accordingly. The primary aim of AI is to produce intelligent machines. The intelligence should be exhibited by thinking, making decisions, solving problems, more importantly by learning. It has many areas of interests *viz* Robotics, Vision, Speech, Natural language, Artificial Neural Systems, Understanding and Expert System (ES). So ES is coming under the broad area of AI. An ES is defined as "a computer program designed to model the problem solving ability of a human expert" (Durkin, 1994).

It is also defined as "a system that uses human knowledge captured in a computer to solve problems that ordinarily require human expertise". 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. 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 ES consists of the following components

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.

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 ES 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.

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 than in the ES 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.

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. Some of the system that does forward chaining is C Language Integrated Production System (CLIPS). EMYCIN is one of the most popular systems performs backward chining. 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.

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.

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 and enable to precede their management.
- User can easily identify the 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.
- Review transactions that human experts may overlook.

Disadvantages of ES

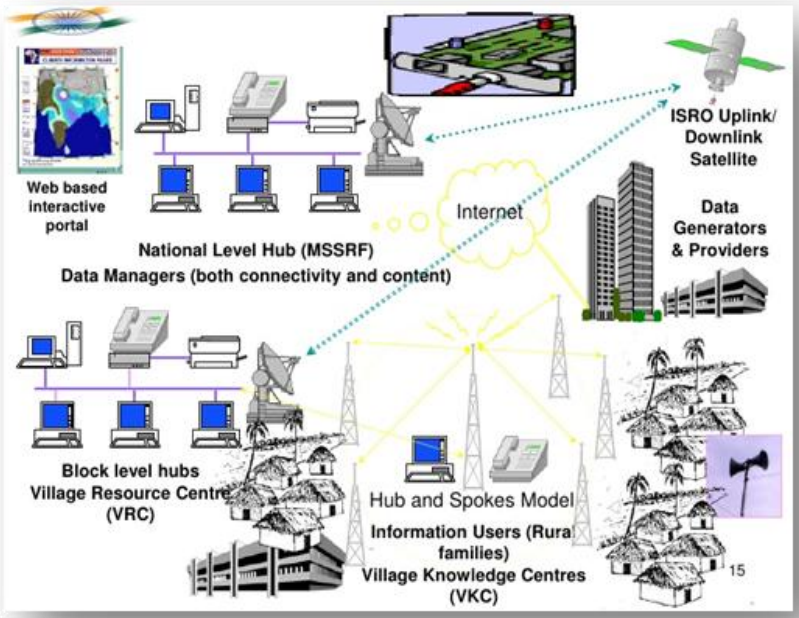
- Lacks common sense needed in some decision making
- Cannot make creative responses as human expert would in unusual circumstances
- Domain experts not always able to explain their logic and reasoning
- Errors may occur in the knowledge base, and lead to wrong decisions
- Cannot adapt to changing environments, unless knowledge base is changed
- Create efficiencies and reduce the time needed to solve problems.
- Combine multiple human expert intelligences.
- Reduce the amount of human errors.
- Review transactions that human experts may overlook.

Village Knowledge Centre

Village Knowledge Centre (VKC) serves as information dissemination centre providing instant access to farmers to latest information/ knowledge available in the field of agriculture, starting from crop production to marketing.

VKC Implementation

The VKC project was started at Villianur, a village in Pondicherry. This project is purely developmental in nature. The cost of setting up a VKC is `2, 00,000 (USD 4,500) approximately. This cost is completely borne by M. S. Swaminathan Research Foundation (MSSRF), which in turn receives aid from international aid agencies such as the International Development Research Centre (IRDC), Canada, and Japanese aid agencies for implementing the project. Typically, MSSRF field officers identify a village to set up a VKC. They identify and train project associates, and create a core group of associates who then canvass the idea of setting up a VKC with village leaders, politicians and land owners. Public meetings are held to "sell" the benefits of VKCs to the villagers. Once the initial contact is made, and the idea of the MSSRF sets up the VKC. A local is identified and selected to be the VKC's volunteer operator. This individual, mostly a woman from the village with at least high school education (even though there have been some exceptions to this rule based on an individual's ability), is then trained by MSSRF on basic computer operations and applications. The volunteer is given training in Windows O/S, MS Office Suite, Adobe PageMaker and Photoshop, Visual Basic, Visual C++, HTML, voice recording, Zip and Unzip utilities and voice and data transmission in a wireless infrastructure. The selected person also receives a small honorarium of Rs. 1200 (approximately $28) per month.



The VKC project uses a Hub and Spokes model. The hub is a "Village Resource Center (VRC)," which is typically connected to 20-30 VKCs spread over a 60Km radius. The VRC is designed to act as a rural library and technology resource center. Each VRC consists of at least three networked computers, one scanner, two web cameras, Internet access, one printer, one digital camera, solar backup facility, and training rooms. Each VRC is in turn connected to the VKCs (and VKCs to other VKCs) using Motorola very high frequency (VHF) radios for voice and data transmission. However, in actual practice, it was noted that this technology posed restrictions on transmission speeds as well as the size of the files transmitted. Each VRC was also connected to other VRCs and the MSSRF headquarters in Chennai through satellite link-ups, in collaboration with the Indian Space Research Organization (ISRO). The ISRO-MSSRF network used one of the Extended C-band transponders of ISRO's satellite INSAT-3A. Users at each VRC and at the headquarters in Chennai could communicate through video and audio links provided by the satellite connection.

As can be seen in Figure, the State-level hub at the MSSRF headquarters (top left quadrant of the figure) is connected to the Internet through Internet Service Providers (ISPs), and to the ISRO up-link satellite through a VSAT antenna. The VRCs at various rural locations are also connected to the ISRO satellite through VSAT. Internet connectivity to the various VRCs is achieved through the ISRO-MSSRF network. The VRCs in turn provide network connectivity to the VKCs.

Domestic and Export Market Intelligence Cell (DEMIC)

Domestic and Export Market Intelligence Cell (DEMIC) was established in November 2004 at Centre for Agricultural and Rural Development Studies (CARDS) in Tamil Nadu Agricultural University, Coimbatore with the financial assistance from Tamil Nadu State Agricultural Marketing Board, and Department Agricultural Marketing and Agri Business.

Department Activities

Establishment and maintenance of Uzhavar Santhaigal for the benefit of farmers as well as consumers.

To create marketing opportunities for small and marginal farmers in cultivation of fruits, vegetables and flowers by formation of groups which includes production, storing and export.

Establishment and maintenance of regulated markets in order to facilitate buying and selling of agricultural produce for the benefit of the farming community.

To create awareness among the farmers about the benefits of marketing their produce through regulated markets by taking up publicity and propaganda.

Commercial grading of agricultural produce in the regulated markets and at farm holdings to help the producers to get remunerative price for their produce.

To take up Agmark grading of agricultural, animal husbandry and forestry products for the benefit of the consumers.

To set up Agriculture Export Zones for promoting export of agricultural produce by increasing the area under exportable crops, providing necessary post harvest management and other infrastructure required and information on prices prevailing at international markets as an integrated approach.

To set up modern cold storage facilities to enable the farmers to store and sell their produce at favourable price level (Cold chain from farm to market).

To promote Food Processing Industries.

Schemes

i. National Horticulture Mission

Since the climatic conditions prevailing in tamilnadu are favourable for cultivation of horticultural crops. The National Horticultural Mission was implemented in tamilnadu with vision of expanding the cultivation area of fruits, vegetables, flowers, medicinal and aromatic plants and thereby increasing the production of horticultural crops. This scheme has been successfully implemented in almost all states of India excluding the states of Himachal Pradesh, Jammu & Kashmir and Uttaranchal by the central government of India. This scheme is implemented with 85% of financial assistance by the central government and 15% of financial assistance by the respective state government in the tenth five year plan.

ii. Uzhavar Santhaigal

UZHAVAR SANTHAIGAL (Farmers Market) for the benefit of farmers as well as the consumers have been set up in the urban areas in Tamil Nadu. This Department has opened all the 28 closed Uzhavar Santhais and rejuvenated the existing 75 Uzhavar Santhais. At present in total 103 Uzhavar Santhais are functioning to ensure farmers to get a better price for their produce and to enable the consumers to get the commodities at a lesser price than in open market.

Every day on average 1010 M.T. of vegetables and fruits worth Rs. 1 Crore is being brought and sold by 7500 farmers on an average benefiting 1,90,000 consumers.

iii. Agmark Grading

Grading under "AGMARK" has already become a symbol of quality. In order to help the consumer to get quality food products, one Principal Laboratory, 30 State Agmark Grading Laboratories and 15 Agricultural Officer (Marketing) Centers are functioning in the State. Agmark grading is done for centralised and de-centralised commodities by the technically qualified staff. Agmark labels are issued to the authorised packers under the direct supervision of the staff for certifying the quality and purity of the food products.

During the year 2006-2007, sophisticated equipments has been purchased under Part- II Scheme for State Agmark grading Labs and Agricultural Marketing Centres in order to benefit the packers and consumers.

iv.Agri Export Zones

To promote Agri Horticultural Produce Exports from Tamil Nadu, four Agri Export Zones for specific commodities have been established as detailed below.

Agri Export Zone for Cut Flowers at Hosur comprising of Dharmapuri and Krishnagiri Districts

Agri Export Zone for flowers in Nilgiris District

Agri Export Zone for Mangoes in Theni District

Agri Export Zone for Cashew in Cuddalore District

Agri Export Zones Proposed

Export Zone for Banana in Tiruchirappalli District

Irrigated Agriculture Modernization and Water Bodies Restoration Management

IAMWARM Project is a World Bank assisted project. Agricultural Marketing plays an important role in marketing the agricultural produce and this department along with other line Departments will strengthen the sub basins. This project will be implemented in the selected 63 sub basins over a period of 6 years.

In the first year, this project will be implemented in the 9 sub basins at a cost of Rs. 8.30 Crores. The Projected cost for 63 sub basins is Rs. 28.48 Crores.

Under this project, the following components like Drying yard, Storage shed, Collection Centre, Pack House, Agri Business Centre, Goods Auto, Mini Lorry, Moisture Meter, (Weighing Scale, Dunnages and Tarpaulin will be provided to benefit the water users Association.

Food Processing Industries

Food processing is gaining momentum as food processing industries ensure steady and better price to the farming community as well as availability of the commodities in processed form to the consumer throughout the year. Processing of food eliminates wastage of agricultural produce to a greater extent. By cultivation of good quality processable agricultural produce the farmers stand to gain better returns. Food Park at Dindigul District, Nilakkottai Industrial Estate is being set up at a total cost of Rs.13.00 crores. The Agricultural Marketing and Agri Business department act as a Nodal agency for Ministry of Food Processing Industries, Government of India, It processes applications recommends and forward the project to Ministry of Food Processing Industries for obtaining grant.

During the financial year 2006-07, 21 proposals worth of Rs.25.17 crores to establish food processing related projects have been forwarded to the Ministry of Food Processing Industries, Government of India with recommendations for grant of Rs.5 Crores. So far an amount of Rs.1.76 Crores grant has been released for 5 projects.

In Total from Tamilnadu, 378 proposals worth Rs.443.88 crores to establish food processing related projects have been forwarded to the Ministry of Food Processing Industries, Government of India with recommendations for grant of Rs.72.80 Crores. So far an amount of Rs. 37.92 Crores grant has been released for 180 projects.

LECTURE –13

Agricultural journalism (Print media) – Definition, principles, importance, ABC of news, types of news

Agricultural Journalism

According to Webster's Third International Dictionary, Journalism means "the collection and editing of material of current interest for presentation, publication or broadcast". According to Chamber's Twentieth Century Dictionary, Journalism means "the profession of conducting or writing for public journals" The word journalism is derived from "journal"; its best contents are 'dujour' of the day itself. Journal means a daily register or a diary – a book containing each day's business or transactions. The word journal also connotes a newspaper published every day or even less often or a magazine. Thus, journalism means "the collection and editing of material of current interest for presentation, publication or broadcast".

A journal is defined as a register of a diary of public events which has a definite periodicity of publications say a daily, weekly, a bi-weekly, fortnightly and monthly so on.

Journalism is defined as a profession of conducting or writing for a journal which may be a newspaper, a magazine, radio, a television.

Agricultural journalism is journalism as applied to agriculture i.e. Agricultural journalism is a profession of conducting or writing in agriculture and allied subjects for a journal, which may be a newspaper, a magazine, radio, a television.

Importance:

Farmers like many others are also curious. They want to know what is happening or has happened about agriculture. They have a desire for information, because they want to have a better knowledge of the world around them and improved their living standards by increasing the productivity and production. News satisfies this curiosity and this desire for information. People who can read, listen and have information enjoy certain status in our villages. Others look to them as 'knowing' or informed people and look to them for information.

The agricultural extension personnel who are on the job to disseminate the news or transfer of technology to the farming community should invariably understand the agricultural journalism and utilize the mass media channels effectively.

Scope:

The farmers are information hungry and present public extension system is not able to meet the demand of the farmers for information. The farmer and extension worker ratio is widening. On the other side, communication tools development is enormous. Private extension is also coming into picture. Today, journalism in India has got lot of scope with media barons opening new channels or newspapers or publishing houses on a regular basis. The competition is so rife that each channel or newspaper tires to produce something exclusive, which in turn has given the audience a great deal of variety.

Characteristics of News:

• News has geographical boundaries

News is always revealing

• News is what interests people

• No news interests all people

• Most people read only part of the paper they buy

• Their reading habit is selective

• They read what they consider is news

Factors determining the news values:

1. **Timeliness**: The reader wants his news to be new. News coming from the press must be really not, in the sense of being not only exciting but new, not till they are known. The news must be need based and timely.

2. **Proximity**: Nearness play a dominant role. The reader finds more interest in a minor event closer to his place than a major and important event happened miles away. But proximity is both geographical and emotional. A farmer of nearby village harvesting a record yield is more interesting to the farmers than in other parts of the country or a far off place. News from research i.e. high yielding variety released by ANGRAU is more important and interests Andhra Pradesh farmers than in Karnataka.

3. **Magnitude (Size):** The very small and very large size also draws the attention of the readers. For example 3000 farmers attending Kisan Mela attracts rather than 100 farmers attending kisan mela. Similarly one or two people died in accident may not be that much important than 40 people died in any accident**.**

4. **Importance:** This is subjective. It has direct bearing on the kind of audience that the newspaper in mind. What sounds important to a local regional newspaper may not be important to The Hindu and vice-versa.

5. **Truthfulness**: Accuracy of the source of the news is important.

6. **Objectivity:** News reporting should be free from bias. People are interested in the papers that maintain objectivity**.**

7. **Names make news (Prominence):** The important persons like President, Prime Minister, Chief Minister and Governor and they make news rather than ordinary person

8. **Suspense:** Readers are more interested in this type of news which gives some suspense in the beginning and giving the information at the end.

9. **Conflict:** Routine and happiest events may not make news but if any quarrel is there that attracts the readers

10. **Human interest**: Readers are attracted by human interest (names of persons and villages).

Sources of News:

1. Result demonstrations
2. Research Stations Research publications – Annual reports, highlights
4. Kisan melas
5. Farmers fields
6. Agricultural Universities / State Departments
7. Other extension activities like field days/training programmes, rythu sadassus etc
8. Plan estimates related to agriculture and allied activities

9. Agriculture finance institutions
10. Agriculture input agencies
11. Agriculture Market committees
12. Electricity and irrigation sectors
13. Farmers committees and associations
14. NGOs etc.

Categories or Types of News

- Before and after event stories
- Experience and success stories
- New development – such as pest outbreaks, scientific discoveries, weather and crop conditions, progress made on plans
- Predictions – such as long range crop and livestock report economic outlook information,
- long range weather forecasts
- Subject matter - when tied to an event, situation, development or problem

LECTURE –14

Participatory Extension Approaches – Meaning, Definition, Importance, Rapid Rural Appraisal (RRA), Participatory Rural Appraisal (PRA) – Resource Mapping, Transect Walk, Matrix ranking, Venn diagram, Seasonal calendar.

Participatory Extension Approaches

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). Shipley (1984) refers to : 'coming beyond or before' one may dally' or prepare for other help or harm' to exemplify the sense of 'making ready'.

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.

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.

Farmer-to-farmer extension, farmer-led extension, farmer-based extension, participatory technology development and dissemination (PTD&D)

Cohen and Uphoff (1977) It 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.

Biggs (1989) It can be sought in 4 different ways contract, consultative, collaborative and collegial.

WHO (1982) It is the process by which individuals, families, or communities assume responsibilities for their own and communities development

Schneider and Libercier (1995) It is way to attain general development objectives like efficiency, equity, good governance, capacity building and sustainability

Typology of Participation

Three different participation process 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 some how 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 or manipulated. This type of management can be divided to co management and self management. Co management means active participation in decision making. In co management though the participation may be limited and not all decision making shared. Self management on the contrary is the most advanced form of power participation. In the strictest sense this refers to peoples direct participation in decision making.

Principles of Participation

1. Inclusion
2. Equal Partnership
3. Transparency
4. Sharing Power
5. Sharing Responsibility
6. Empowerment
7. Co operation

Inclusion – of all people or representatives of all groups who will be affected by the results of a decision or a process – for example a development project.

Equal partnership – recognizing that every person skill, ability and initiative and has equal rights to participate in the process regardless of their status.

Transparency – all participants must help to create a climate conducive to open communication and building dialogue.

Sharing power – authority and power must be balanced evenly between all stakeholders to avoid the domination of one party.

Sharing responsibility – similarly, all stakeholders have equal responsibility for decision that are made and each should have clear responsibilities within each process.

Empowerment – 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.

Cooperation – co operation is very important : 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 even though they keep silent throughout, community members attend project planning, implementation and review meetings , even though they keep silent throughout; community members are actively involved in decision about how to implement a particular project and provide some of the necessary supports and inputs.

Characteristics of Participatory Approach

According to **Hagmann et.al (1996)**

1. Everyone can benefit as all are free to attend meetings
2. There is a Dialogue
3. Farmers are drivers
4. No discrimination against poor/ rich.
5. The process is explained process
6. Extension agent pay attention to farmers.

7. Farmers are given choice of option.

Importance of Participatory Extension

- ⦿ It helps to work cooperatively
- ⦿ Learning through sharing
- ⦿ It can help farmers to develop the ability to encourage each other in farm activities.
- ⦿ Encouragement to practice through various option
- ⦿ It mobilizes large no of people
- ⦿ Farmers are free to ask advice
- ⦿ Brings desirable techniques
- ⦿ It will bring about development in the area
- ⦿ It is very effective in sustainable development

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.

Mainly due to the institutional support which it has received in a few key locations, particularly the International Institute of Environment and Development (IIED) in London, and the Universities of Khon Kaen in Thailand and Sussex in the UK, and at several of

international agricultural research institutes around the world, Rapid Rural Appraisal came to be the most widely accepted title for these alternative methodologies during the 1980s.

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.

Principles of RRA:

i) Structured but flexible:

RRA is a structured activity requiring careful planning, clear objectives, the right balance of people involved and a good choice of tools and techniques for use in the field. At the same time, it is flexible enough to respond to local conditions and unexpected circumstances. Progress is reviewed constantly so that new information can be understood and the focus of the RRA redirected.

ii) Integrated and interdisciplinary:

RRA helps "outsiders" to learn about rural conditions by looking at them from many points of view. This means having people participating with a variety of different technical and scientific skills and a balance of different institutional outlooks. This requires an integrated development approach which cuts across institutional and disciplinary boundaries

iii) Awareness of bias:

Researchers and development workers who are trying to understand rural conditions can be biased by their urban attitudes, their own professional and personal priorities, the type of transport they use, the language they speak. The people researchers talk to can be biased as well by their limited experience, their customs and beliefs and their own interests and those of their families. RRA seeks to avoid biases by being aware of them and by being systematic in taking into account different points of view and different sets of interests.

iv) Accelerating the planning process:

RRA tries to shorten the time it takes to get from knowing nothing about an area or a situation to deciding what development interventions might be best for that area by using key informants, careful observation and by exploiting the knowledge and experience of local people. The information produced is analysed "on the spot" and presented in a form which is more easily used by planners and which can be discussed and understood by local people themselves

v) Interaction with and learning from local people:

Whatever the purpose of the RRA it must involve the people who are the intended "beneficiaries" of any eventual development activities. RRA should give them the opportunity to describe their lives and conditions. The people carrying out an RRA must be prepared to listen to local people and learn from them. Participation by local people can take many forms but any RRA will involve intense interaction between researchers, planners, traditional and formal authorities and local people

vi) Combination of different tools:

The RRA approach uses a combination of communication and learning tools. These tools help outsiders to observe conditions in a concise but systematic way. They also allow local people to present their knowledge, concerns and priorities to outsiders. The combination of different tools and techniques builds up a more complete picture where different viewpoints can be compared and contrasted. The systematic cross-checking of information collected in different ways by different people from different sources can increases accuracy and comprehensiveness

***vii) Iterative*:**

During an RRA, what has been learnt is constantly reviewed and analysed in the field. This is usually done in workshops carried out at regular intervals. This means the focus of the RRA, the tools used and the people talked to can be adjusted constantly.

RRA Tools:

Some of the most widely used RRA tools are reviewed below.

A) SECONDARY DATA REVIEWS

"A thorough and systematic review of all possible existing sources of information about the topic or topics which are the focus of the RRA"

General sources:

1. Government statistics, departmental reports
2. Projects reports, environmental impact studies for engineering projects
3. Reports of other agencies or NGOs working in the area or on similar topics in other areas
4. University libraries - research theses, survey reports, anthropological publications, journals
5. Local libraries and museums
6. Mission records
7. Historical accounts of the area
8. Maps from government surveys, mining companies, local military or other sources
9. Aerial photographs, satellite imagery

Purpose:

1. To confirm the need for an RRA
2. To provide basic data on population, environment, agriculture
3. To provide historical perspective
4. To collect all available information

B) WORKSHOPS:

Key features:

1. Everyone involved needs to be encourage to contribute

2. Someone needs to moderate to keep the workshop moving and ensure that the Tasks set are performed
3. The output of the workshop needs to be recorded
4. Some form of media for presenting ideas, findings and reports

C) SEMI-STRUCTURED INTERVIEW TECHNIQUES:

Key features*:*

1. No set questions or questionnaires but instead topics for discussion from checklist
2. Flexible in terms of where and how carried out - at home, in public places, at work sites, at the pond-side
3. Ideally carried out by at least two team members - one to ask questions, another to record responses and discussion
4. Key topics agreed upon ahead of time by team members involved and used as a guide for discussion to keep interview "on track"
5. Accommodate local traditions regarding conversation, interaction with strangers, greetings, etc.

Main types:

I) Key informant interviews:

Involving individuals who are thought to have special knowledge about a particular topic of set of topics (old people, community leaders, doctors, teachers, people involved in particular activities).

II) ***Focus group discussions:***

Involving groups of people with an interest in a particular topic or issue. These might be groups of resource users, members of a particular social or occupational group or members of institutions.

III) ***Individual or household interviews:***

Interviews with individuals or household groups either met by chance, or selected according to an approximate sampling of different social or economic groups within the

community. These can be particularly important for understanding household survival strategies and intra-household dynamics.

***Purpose*:**

1) Obtain information on specific issues.
2) Give local people opportunity to ask questions and discuss their own priorities.
3) Create forum for more general discussion from which new issues and topics for research can arise.
4) Create forum for use of RRA communication tools.

D) RANKING AND CLASSIFICATION TECHNIQUES:

Key features:

1) Can be used as formal exercise or as aid to interviewing
2) Provides focus for discussion
3) Can be carried out with individuals or with groups
4) Provides a clear, graphic form of presentation of local people's ideas
5) Adaptable to local circumstances and can use materials readily understood and manipulated by local people

Main types:

I) ***Local classifications and taxonomies:***

Local people can be asked to list local names for items such as animal, plants, landtypes and then group different items, resources or activities together into categories and then explain the features between different categories

II) ***Matrix ranking:***

Using local classifications, the features or characteristics of groups of items or resources can be ranked according to different criteria such as reliability, seasonal stability, price, income generated, preferences.

III) ***Pair-wise ranking:***

A more detailed ranking can be obtained using pair-wise ranking which compares pairs of items in a group until all are placed in an order of priority according to certain criteria.

IV) ***Indicative ranking****:*

A notional ranking can be used in many circumstances to provide indications of relative size or importance of particular features, numbers of people involved in activities. Local materials such as stones or beans can be used to quickly indicate proportions or numbers in a more concrete fashion.

Purpose:

1) To understand local people's priorities
2) To understand why certain choices are made
3) To understand the local environment and people's knowledge of it
4) To understand local terminology and classifications

E) **DIAGRAMMES AND GRAPHICS:**

Key features*:*

- Properly used, they can help communication by overcoming language barriers
- Provide a structure to information which can help both the people providing that information (local people) and those using it or passing it on to others
- May be very location and culture specific
- Provide a focus for discussions and questioning

Main types**:**

I) Venn diagrammes:

Particularly useful for illustrating the relationships between different groups and institutions within communities, with points of contact, overlaps and relative sizes.

II) Graphs and bar charts:

Simple graphs or bar charts can be used to present quantitative data, even if the quantities are approximative.

III) Flow charts / decision trees:

Flow charts can be used to illustrate practically any process : the use of certain resources for different activities, the movement of resources within the farming system, patterns of decision-making or genealogies.

IV) Pie charts:

Pie charts can be used to represent proportions and to look at time-use. Daily activity patterns can be presented in this form.

Purpose:

1. To provide approximate quantification and relative proportions of any activity, phenomenon, group, etc.
2. To illustrate processes
3. To provide graphic representations understandable to local people and outsiders

***F)* MAPPING TECHNIQUES:**

Key features:

- A means of representing the area being studied and its characteristics which can involve local people
- A good introductory activity to get range of local people active in the appraisal
- Can make use of any appropriate local media
- Provides concrete focus for subsequent discussions
- An output easily understood by local people

***Main types*:**

I) Sketch mapping and modelling:

These can use either maps prepared in the field with the participation of local people or base maps prepared prior to the RRA. Mapping with local people can become an important forum for discussion of local problems and needs and involve a large number of people in the RRA. Use of base maps is more for team members.

II) Thematic mapping:

Using general sketch maps as a basis, specific themes or topics can be mapped, such as land ownership, poverty distribution, water run-off.

III) Resource mapping:

The distribution, ownership and the use of different resources can be shown using a base map. This can then be developed into a zoning of the resource features of the area

IV) Historical mapping:

Maps prepared by local people to illustrate the way a community or area has changed. Old maps can be used as a source as well.

Purpose:

1. To understand the spatial distribution of aquaculture-related factors
2. To familiarise outside teams with the area
3. To understand local people priorities and understanding of their environment

G) STRUCTURED OBSERVATION:

Key features:

- Flexible
- Includes more formal exercises involving groups of people and prior planning as well as quick techniques for use during interviews
- Can be used to involve range of people in appraisal (transect walks)
- Focuses attention on details of environment
- Makes use of local people's observations

Main types

I) Transect walks:

Walks taken in company with local people along transects through the area under study. The transects take in as wide a range of environments and conditions as possible and provide an opportunity to observe activities, agro-ecological conditions and talk to people about them. Observations can be recorded as drawings or notes. These can be developed into detailed transects through the community or area showing agroecological zones, problems and potential, crops, etc.

II) Key indicators:

Particular features which can be taken as indicators of more general conditions can be identified either prior to or during the appraisal so that they can be measured or looked for during field work. Indicators can be identified for relative wealth or poverty, social and economic status or ecological and environmental conditions

Purpose:

1) To ensure that all observations during appraisals are used and recorded
2) To structure observations so that they produce usable outputs
3) To focus attention of appraisal teams on local features that may otherwise go unobserved

H) UNDERSTANDING PROCESSES AND CHANGE:

***Key features*:**

- Makes use of graphics to clarify processes
- Establishes connections between different sets of factors and conditions
- Takes account of past changes, current conditions and predicts future trends

Main types:

I) Timelines:

These can be used to represent periods of time up to the present and significant events which have occurred in the past. These can provide the basis for discussions of changes and trends

II) Seasonal calendars:

Understanding in detail seasonal patterns of crop production, labour demand, consumption, income and expenditure is fundamental to the understanding of rural communities. All activities can be placed in a seasonal context using simple charts.

III) Process diagrammes:

Particularly important events in the past can be analysed using process diagrammes showing causes and effects in time

IV) Historical maps and transects:

Maps and transects can be prepared to illustrate historical changes based on the accounts of local people

V) Oral histories:

Stories told by individuals or life histories can be used to cross-check accounts of the history of the community as a whole.

Purpose:

- To understand conditions outside the period covered by the RRA
- To understand processes leading up to current conditions and trends for the future

I) COMMUNITY MEETINGS:

Key features:

- Consensus building
- Conflict resolution
- Group discussion of issues, problems and appraisal findings

Main types:

I) Introductory meetings:

Communities can be called together at the beginning of an appraisal in order to explain the purpose of the RRA and elicit support and co-operation. Such meetings can be developed into exercises such as community mapping and group transect walks involving a cross-section of community members. In some cases such introductory meetings may be fundamental in order to put people at ease regarding the presence of strangers in the community.

II) Community workshops:

Workshops held during the course of the RRA to analyse findings and review progress can, if appropriate, be expanded to involve members of the community or even the community as a whole. Care has to be taken regarding the expectations which such meetings can raise.

III) Community workshops Presentation of RRA findings:

At the end of an RRA, a community meeting can be called to present the RRA findings back to the community. This provides an opportunity for local people to cross-check the findings of the team and provide their own comments. Where follow-up action is envisaged, such meetings can be important in ensuring general consensus regarding problems and issues identified and action to be taken in the future.

***Purpose*:**

- To elicit greater involvement of local people in appraisal
- To clarify purpose and objectives of appraisal
- To present findings of appraisal and elicit comments and corrections

Relation of RRA with other types of research and planning tools:

However, a range of other terms are used for broadly similar techniques. Some of the principal types of research and planning tool which are similar or related to RRA are given below.

TERMINOLOGY	DESCRIPTION	SOURCE
• Rapid Diagnostic Tools (RDT)	• Used to describe the various research and learning tools used in RRA when used discretely or not during a "formal" RRA	IIED, London
• Agro-Ecosystem Analysis	• The process of analysis of farming systems and their environment to which RRA can make an important contribution	IIED, London
• Participatory Learning and Action (PLA)	• A relatively recent synthesis of RRA, PRA and other participatory research techniques	IIED, London
• Diagnosis and Design	• A system of diagnostic surveys and planning discussions for the analysis of community and agro-forestry issues and planning of community forestry activities	ICRAF, Nairobi
• Participatory Assessment, Monitoring and Evaluation (PAME)	• A collection of ideas, methods and tools for participatory planning of community forestry	FAO/SIDA/ Forest, Trees and People Programme, Rome
• Participatory Learning Methods (PALM)	• Essentially similar to PRA with emphasis on participatory planning	MYRADA, Bangalore
• Action Research	• An approach to research which encourages active participation by the subjects of the research and participatory planning of action as a result of research	Wide range of national and international NGOs

Some of these terms, notably Rapid Diagnostic Tools (RDT), refer to techniques which are "part" of RRA. Others, such as Agro-Ecosystem Analysis (AEA), refer to approaches to analysis of rural systems which employ RRA as part of their research and planning methodology. In the planning methods, such as Diagnosis and Design, RRA is used as a tool for collection information and analysing it. In the participatory approaches, such as PALM and PAME, the approaches used might be more appropriately referred to as "PRA" as the participatory elements are given more importance. However, within these approaches, RRA tools are widely used as well.

TYPES OF RRA:

The early days of development of RRA four broad categories of RRA "types" have generally been identified and, provided the limits of any categorisation are remembered, they are still valid. These "types" were first suggested by McCracken, Pretty and Conway at IIED in their work on RRA in the late 1980s (1987).

These categories are:

- "Exploratory" RRAs
- "Topical" RRAs
- "Monitoring and Evaluation" RRAs
- "Participatory" RRAs

i) Exploratory RRAs:

These are RRAs that aim to help development workers and planners learn about rural conditions in particular areas with a view to designing appropriate development activities. Those carrying out the appraisal may not know very much about the area they are looking at and want to find out as much as possible that is relevant to their work.

Exploratory RRAs look at a wider range of topics and issues and try to understand the connections between them. They can use a variety of parameters as a starting point : a region, an area, a water catchment, a group of communities, a social or occupational group or a particular resource.

Exploratory RRAs need to be genuinely multi-disciplinary so that they cover as many aspects of the particular area of focus as possible and identify unexpected connections within and around the system being investigated. They are thus more likely to involve larger teams and a greater range of institutions and disciplines. Clearly, the more different points of view which can be represented on the team for an exploratory RRA, the more complete the coverage of different aspects of local conditions is likely to be. On the other hand, a team which is too large can become unwieldy and difficult to manage, as well as being intrusive for local communities.

USES OF EXPLORATORY RRAS:

Planning for integrated development –In integrated or area development programmes, an RRA or series of RRAs is often conducted early in the planning phase of the programme to identify priority problems and issues in the communities covered.

Research on rural systems –RRA can be used to understand the principal features of rural systems in an area in order to identify priority fields for intervention.

Assessment of resource use –Agencies concerned with a particular resource or set of resources, such as forests or water, can use RRA to understand how these resources are being used and what their conditions are.

Identifying locations for development activities - Technical agencies looking for suitable locations for development projects or pilot activities use RRAs to quickly assess the suitability of a wide number of sites.

Topical RRAs:

Topical RRAs focus on a more specific range of issues with a view to understanding them more completely and in greater depth. Those carrying out the appraisal already know something about the area they are working in, and perhaps about the topic of the appraisal, but they want to find out more.

A topical RRA could focus on a particular issue uncovered during the course of a more general, “exploratory” RRA. It could aim to clarify contradictions in data from a larger,

formal survey. It could directly address problems in the particular field of concern of a development agency (such as aquaculture).

The teams carrying out topical RRAs can be smaller than those involved in exploratory RRAs. But even if the focus is more limited, the need for a variety of different points of view is just as important if a systematic understanding of problems is to be achieved. Particularly where the people involved are already familiar with the area and have well-developed ideas and opinions about local conditions, specific efforts should be made to involve new people who may be able to provide an important alternative viewpoint.

USES OF TOPICAL RRAS:

Researching specific features –To rapidly assess a specific feature of local conditions, for example the nutritional importance of fish, researchers can use a focused RRA to obtain a qualitative picture of fish consumption in a particular area or among a particular group of people.

Identifying participants in trials –To organise on-farm trials of new crops or cropping practices a project might carry out a topical RRA to identify farmers and plots where such trials could be carried out.

Understanding resource-use –Projects concerned with natural resource planning use RRAs to understand the use-patterns of particular sets of resources

Testing hypotheses –Researchers or development workers use RRAs to test a particular hypothesis or idea which may have been suggested by their work.

Monitoring and Evaluation RRAs:

RRAs can also be used for the monitoring and evaluation of on-going activities. Such RRAs could be very similar to topical RRAs, taking a selected range of issues and assessing the impact of development activities on them. They could also be more exploratory, looking at conditions in general and trying to understand how they have been affected by a project or programme.

Many agencies require evaluations which measure the performance of activities in quantitative terms. But RRAs can be used to check on whether the parameters measured by an evaluation might exclude some important qualitative factors. They can provide corroboration of other methods of evaluation.

USES OF MONITORING AND EVALUATION RRAS:

Performance review –RRAs can be used to rapidly assess the progress and performance of a development activity, even on a routine basis or combined with quantitative monitoring.

Qualitative monitoring of impacts –RRAs can be used on a regular basis to monitor qualitatively the impacts of an activity or project on beneficiaries or on other people not targeted by the activity.

Trouble-shooting –RRAs are well-suited to checking on possible problems in a development activity and investigating difficulties in implementation

Qualitative evaluation –An RRA could be used as part of the evaluation of a project, testing the opinions of a large range of interested groups regarding the effects of development interventions, rather than trying to measure a few parameters

Participatory RRAs:

The "definition" of Participatory RRAs has become progressively less clear as Participatory Rural Appraisal (or PRA) has developed as a distinct methodology. The absence of the term "rapid" is significant as PRAs are often very time-consuming. For the purposes of this document, the discussion of Participatory RRAs is included in the discussion of PRA below.

However, attention needs to be paid to the terms used by some practitioners. Some writers and field workers would make a clear distinction between a Participatory RRA (which is fairly rapid) which emphasises the elements which encourage participation by local people, and a PRA which is completely oriented towards initiating a process of participatory planning where local people are the main actors involved. The difference can be very important. If the two categories are placed together in this paper it is principally with a view to simplifying the presentation for people who are working in the field.

Strengths of RRA approaches:

- The approach is responsive and flexible to new learning and conditions on the ground
- Achieves a complex understanding of processes and dynamics and connections between different disciplines, activities and sets of conditions.
- The analysis and interpretation of findings is carried out during the appraisal providing opportunities for cross-checking.

Disadvantages of RRA approaches:

- The findings will not be statistically "sound", even if RRA teams can use "quick and dirty" sampling methods to make sure that they cover a reasonable number of people or households in a particular area
- Risk that the information gathered by an RRA is not very "representative" but is a collection of "particular cases" which do not tell researchers very much about general conditions
- RRA is very dependent on the skills of the people carrying it out and having the right combination of experience and viewpoints on the team

PARTICIPATORY RURAL APPRAISAL

Participatory Rural Appraisal is a short-cut method of data collection; 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.

PRA grew out of biases of rural development tourism-the phenomenon of the brief rural visit by the urban-based professionals-of the cost, inaccuracies and delays of large scale questionnaire surveys.

PRA provides the middle path of greater cost effectiveness between rural development tourism research (quick and dirty) and the tradition of academic research (lengthy and boring).

But *PRA uses similar* guidelines *and* tools *to RRA but focuses on the stimulation of participation by local people. Specific techniques are used to encourage greater involvement among people and to enable them to take the leading role in appraising conditions and identifying solutions.*

Principles and features

- Respecting people's knowledge and learning from them.
- Listening to the disadvantaged: Respect
- Optimal ignorance: Do not collect data, which you do not need.
- Flexibility: PRA does not stick to fixed plan to action.
- Visualization: All data collected from the people are visualized by them
- Triangulation
- It involves a team of people working with a community for several days.
- Analysis is done in the field
- Continuity

Most of the principles and features of PRA is similar to the RRA.

POTENTIAL DIFFERENCES BETWEEN RRA AND PRA			
RRA		*PRA*	
•	Responding to needs of development workers and agencies	•	Responding to needs of communities and target groups
•	More emphasis on efficient use of time & achievement of objectives	•	More emphasis on flexibility to adapt to time frame of community
•	Communication and learning tools used to help outsiders analyse conditions and understand local people	•	Communication and learning tools used to help local people analyse their own conditions and communicate with outsiders
•	Focus of RRA decided by outsiders	•	Focus of PRA decided by communities
•	End product mainly used by development agencies and outsiders	•	End product mainly used by community

•	Enables development agencies and institutions to be more "participatory"	•	Enables (empowers) communities to make demands on development agencies and institutions
•	Can be used purely for "research" purposes without necessarily linking to subsequent action or intervention	•	Closely linked to action or intervention and requiring immediate availability of support for decisions and conclusion s reached by communities as a result of the PRA

Advantages and disadvantages of PRA

The advantages of adopting a more participatory approach to development planning have been well-documented although there has been less discussion of the disadvantages. The ways in which these advantages and disadvantages might effect aquaculture planning are more difficult to establish as documentation of cases of PRA use specifically for aquaculture are few and far between. One reason for this is that PRAs are generally not specific to any particular discipline but are, almost by definition, part of an integrated approach which might or might not include aquaculture.

However, here the principal positive and negative features of PRA are listed and how these features might manifest themselves for aquaculture workers is

Advantages

• 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. Where aquaculture is identified as a priority during the course of a PRA, planners can be more secure that this responds to a real need among local people, whether that be for increased income, better fish supply or more intensive water use and management. The risks of outside planners "imposing" aquaculture as a solution and then discovering that local people are not really interested or committed to its development can be significantly reduced.

• Devolution of management responsibilities

An important goal of PRA is to encourage self-reliant development with as much of the responsibility for the 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. Particularly for an activity like aquaculture, trials carried out in communities by projects run by outsiders are frequently plagued by problems of mismanagement and theft. This is usually linked to the fact that the community does not actually feel any responsibility for the activity and regards it as a temporary benefit to be exploited for as much as possible while it is there. An activity generated by a PRA will usually be managed by the community and the benefits will be clear to them.

• ***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. Where changes in development approaches are being introduced, such as a shift to a more integrated development planning mechanism, a PRA-type activity which illustrates how these new mechanisms will work on the ground can help to ensure better understanding and commitment by local workers. This is one reason why involvement of people from different administrative and organisational levels can be vital so that commitment is built up right through the chain. Aquaculture workers may not be used to working together with other disciplines. 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. This can benefit aquaculture workers by helping them with the monitoring of aquaculture development and environmental issues related to aquaculture. An example might be in a mangrove area subject to environmental regulation but where monitoring is difficult. A PRA which encourages a better understanding of the environmental issues at stake in local communities and develops activities which enable them to benefit from better management could also lead to better monitoring of mangrove exploitation by the communities themselves. 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. In the case of aquaculture this might mean the use of local instead of exotic fish species, the improvement of existing water bodies rather than the creation of new ones or the design of activities which fit into current livelihood strategies rather than creating new strategies.

• ***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.

These benefits from participation can only be realised where the full implications of participation for the development agencies which are encouraging it have been taken into account and accommodated and the institutions involved are willing to support the sort of long-term changes in social, political and institutional frameworks which proper participation, and PRA, can set in motion. Where this is not the case, many of the following disadvantages can come into play.

Disadvantages

• *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 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. In some cases the intended aim of the PRA may be to deliberately raise expectations "at the grassroots" so as to put pressure on the institutional and political structures above to change. However, not all development agencies are in a position to support such activities and there is a risk that agencies which are not properly equipped to respond to PRA-type planning may use the approach inappropriately. Aquaculture agencies might well be encouraged to use "PRA", by donors for example, only to find that they are encouraging local people to participate in planning and decision-making in a society or political framework which positively discourages grassroots participation.

• 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. This again comes back to the problem that the "playing field" in PRA has practically no boundaries and this can make the approach inappropriate for sectorally oriented agencies. This would include many aquaculture departments organised along traditional lines.

• Risk of "capture" of activities by local interests

By devolving decision-making responsibility to communities and leaving the identification and planning of activities to them, there is also a real risk that particular elements in communities - the more educated, the wealthiest, those with authority - may find it easier to "capture" the activity and monopolise its benefits. The relative lack of outside involvement in a participatory planning process can make this much easier. 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. Aquaculture can be particularly prone to this as it is often proposed as a means of making better use of "common" land or water areas. 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

The fact that PRA is often carried out with the community as a whole can mean that stratification within the community, whether by wealth, social status, gender or ethnic group, can often be obscured and ignored. This may happen even though preliminary research in the community has clearly identified that there are strata and different sets of interests in the community. 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

LECTURE –15

Participatory Technology Development – Meaning and steps

Participatory Technology Development (PTD)

PTD is a strategic action and a purposeful process by which scientists sponsored technology is tested, suitably modified and refined by the farmers in their fields leading to its, viability and acceptability by them in their farming situations.

Key features of PTD

- **Client-based**: The knowledge, needs, criteria, and references of farmers are given importance in decisions regarding research agenda, prioritization of problems for research, choice of methodologies, and verification, validation, dissemination and adoption of research results.

- **Decentralized research/technology development**
- **Devolution of more responsibility to farmers for adaptive testing**
- **Accountability sharing**
- **Focuses on farmer-led experimentation**
- **Tests the relevance of farmers' problem solving measures**
- **Takes in to account the local resources**
- **Is often based on indigenous technical knowledge and native wisdom of farmers**
- **Emphasizes use of low cost and locally available resources**

Steps in PTD Process

To have a more meaningful and effective PTD process for suitable and appropriate technology development so as to enable farmers to use and implement the technologies in their fields, following steps are suggested.

Step 1. Getting started in field
Step 2. Understanding Problems and Potentials
Step 3. Looking for thinking to try
Step 4. Designing Experiments
Step 5. Trying out
Step 6. Evaluation of the experiments
Step 7. Sharing results with others
Step 8. Sustaining the PTD Process
Step 9. Scaling up/Phasing out

Benefits of PTD

PTD originates from the recent evidence that user participation can be critical in preadaptive (or upstream) stages of certain types of research. In contrast to earlier approaches to on-farm research, pre-adaptive PTD and development brings users directly into early stages of technology development, as researchers and decision makers who help set priorities, define criteria for success and determine when an innovation is ready for release to farmers. The benefits of this approach are:

- The technologies and more rigorously tested under users‟ conditions.
- Farmers‟ participation in defining research agendas, conducting trials, and evaluating results could increase the chance that technologies developed will be more suitable to their circumstances in diverse agro-ecological and socio-economic situations.
- Farmers are motivated when their views are respected.
- The indigenous technical knowledge of farmers can be gainfully tapped.
- Enhances the capacity of farmers to adapt technologies by encouraging farmer experimentation.
- Technology is more likely to be adopted.
- Technologies are in users hands more rapidly.
- Farmers‟ knowledge and creativity are harnessed to develop appropriate technology.
- Participatory approaches complement station-based research by systematizing feedback in orienting the research focus and accordingly guide the development of technological alternatives.

LECTURE –16

Diffusion of Innovations – Definition, elements; Innovation – definition attributes. Adoption – meaning, steps in adoption process, Innovation Decision process.

Diffusion and adoption are closely interrelated even though they are conceptually distinct. Diffusion of Innovations is a theory that seeks to explain how, why, and at what rate new ideas and technology spread through cultures.

Diffusion of Innovations is a theory that seeks to explain how, why, and at what rate new ideas and technology spread through cultures. Everett Rogers, a professor of rural sociology, popularized the theory in his 1962 book *Diffusion of Innovations*. He said diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. The origins of the diffusion of innovations theory are varied and span multiple disciplines.

Diffusion of innovations refers to the spread of those innovations through a population, and is simply the result of a host of individual adoption decisions. According to Rogers 1962 the diffusion process can be explained as "the spread of a new idea from its source of invention or creation to its ultimate use of adopters". The process by which an innovation spreads within a social system is called "diffusion". An innovation diffuses within a social system through its "adoption" by individual and groups.

Diffusion and its Components

Definition

Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system.

Meaning

It is a special and significant type of communication in that the messages are dealing only the novel ideas generated in the laboratory to be spread among a larger number of social systems. It is the newness of the idea in the message content of communication that adds diffusion its special trait and importance.

Elements of Diffusion

a. Innovation
b. Channels
c. Overtime
d. Members of the social system

a. Innovation: It is an idea which is a new one supposed to be adopted by the intended clientele. It may not always hold objectivity due to lapse of time since its discovery.

b. Channel: It is the mean or transmission lines through which the innovation is communicated to reach its audience.

c. Overtime: 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.

d. Members of the social system: It is the degree to which an innovation reaches a significant group of individuals to accept and adopt the new idea being implemented. High cost farm equipment may be difficult to be tried in small parts.

An ***innovation*** is an idea, practice or object that is perceived as new by an individual or other unit of adoption. Perception is an activity through which an individual becomes aware of objects around oneself and of events taking place. The technologies, practices developed through research are innovations. These may be new varieties of crops and plants, new breeds of livestock, new chemicals and medicines, new technique of doing things etc. Farmers themselves may develop some new practices which are also 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.

Perceived attributes of Innovations

Attributes are qualities, characteristics or traits possessed by an object. An innovation has some qualities or characteristics. It is not the intrinsic quality, but the quality or character of the innovation as people see to them, is important for extension. The perceived attributes of innovations which are which are basic to extension are as follows.

1. ***Relative Advantage:*** The degree to which an innovation is perceived as better than the idea it supersedes. The relative advantage may have 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.

2. ***Compatibility:*** The degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of the potential adopters. Compatibility has at least two dimensions situational compatibility and cultural compatibility. When a new crop variety suits the agro- climate condition of the farmer, it indicates situational compatibility. When a breed of live-stick advocated to the farmers 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.

3. ***Complexity:*** The degree to which an innovation is perceived as 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, 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.

   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 trainings and communication support for the clientele, for their adoption and continued use.

4. ***Trialability:*** The degree to which an innovation may be experimented 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 can't 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.
5. ***Observability:*** the degree to which the results of an innovation and visible. 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 fertilizers 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. Understanding the beneficial effects of balanced fertilization by the farmers, which is more profitable in the long run, requires high level comprehension, which may be brought about by intensive training and communication.

Disease control has two aspects – preventive and curative. 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 seed potato has, however, very high rate of diffusion, because preventing disease in this high investment crop brings higher return, i.e. has high relative advantage. The problem of lack of observability may; however be overcome by strengthening extension efforts like training, communication etc. which can enlarge one's vision and reasoning.

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. Substance farmers are often very cautious when 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.

By following Dube (1971), a few questions may be asked in respect of an innovation to determine its possibility of being adopted in a social system.

1. Does the innovation meet a felt need?
2. Do the people perceive any advantage in the innovation?
3. Is the innovation compatible with the situation and norms of the culture in which it is sought to be diffused?
4. Do people have the resources and facilities to adopt the innovation?
5. Can the people easily master the techniques involved in the innovation?
6. Does the gain from the adoption of the innovation- in terms of economic advantage, efficiency, prestige and so forth – adequately compensate the additional expenditure of money, time, labour etc. that its adoption may involve?

It replies to the questions are in the affirmative, the innovations is likely to be adopted soon.

Adoption-It is a decision to make full use of an innovation as a 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

The Adoption Process

Ryan and Gross (1943), were probably the first to recognize that the adoption of a new idea consisted of stages. They distinguished between 'awareness' of hybrid seed corn, 'conviction' of its usefulness, trial 'acceptance' and 'complete adoption' of the innovation.

Wilkening (1953) described the adoption of an 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 adoption stages- awareness, obtaining information, conviction trial, and adoption.

Adoption is essentially a decision- making process. According to Johnson and Haver (1955), decision- making involves the following steps –

1. Observing the problem,
2. Making analysis of it,
3. Deciding the available courses of action,
4. Taking one course, and
5. Accepting the consequences of the decision.

Decision- making is a process which may be divided into a sequence of stages with a distinct type of activity occurring during each stage.

Similarly, the way in which an individual adopts an innovation is viewed by most researchers as a process, a series of related events in a time sequence.

The North Central Rural Sociology Subcommittee for the study of Diffusion of Form Practices (1955) identified five stages of the adoption process, which received world- wide attention.

These are –

1. *Awareness*, 2. *Interest*, 3. *Evaluation*, 4. *Trial* 5. *Adoption.*

According to them adoption is not an instantaneous act. It is a process that occurs over a period of time and consists of a series of actions.

1. **Awareness Stage**

The individual learns of the existence of the new idea but lacks information about it. At this stage an individual is aware of the idea, but lacks detailed information about it. For instance, the person may know only the name and may not know what the idea is, what it will do or how it will work.

2. Interest Stage

The individual develops interest in the innovation and seeks additional information about it. At this stage the individual develops interest in the idea and tries to acquire more information about it. The person wants to know what it is, how it works and what its potentialities are.

3. **Evaluation 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. At this stage the individual judges the worth of innovation. The person makes an assessment whether the idea is applicable to own situation, and if applied what would be the result.

4. Trial Stage

The individual actually applies the new idea on a small scale in order to determine its utility in own situation. If, in the judgment of the individual the innovation has some plus points i.e. applicable to own situation, and if applied shall in some way or other be of advantage, the person takes a decision to try it. These are generally small scale trials to test the effectiveness of the innovation in one's own situation-apparently individuals need to test a new idea even though they have thought about it for long time and gathered information concerning it.

5. Adoption Stage

The individual uses the new idea continuously on a full scale. Trial may be considered as the practical evaluation of an innovation. It provides evidence of the advantages of the innovation. Being satisfied with the trial and considering the pros and cons of the situation, the individual takes a final decision and applies the innovation in a scale appropriate to own situation on a continued basis.

According to Singh (1965), the stages of adoption are dynamic and not static. The same five stages do not occur with all the adopters and all the practices. The sequence is not

always the same. Sometimes one stage appears more than once. In some cases some stages are so short as to be imperceptible, and in other cases some stages seem to be skipped. There are no clear cut differences and sometimes the whole process is capsule and looks like a unit act. According to him the stages are –

1. **Need:** In this stage individual wishes the situation could be changed, expresses dissatisfaction and develops a compromise.

2. **Awareness:** the individual comes to know of something which is related to one's own need or arouse the interest. The person becomes acquainted with broad features of the innovation and knows the source of availability.

3. **Interest:** In this stage the individual tries to know more about the innovation. Asks extension agents or friends and seeks information and sees the innovation.

4. **Deliberation:** The individual mentally examines the possibility of application o f the innovation under own condition. Seeks advice of opinion leaders, observes the performance at different places and discusses with the members of the family. The individual then takes a decision to try not or reject the idea.

5. **Trial:** The individual puts the practice on a limited scale to observe the performance under own conditions.

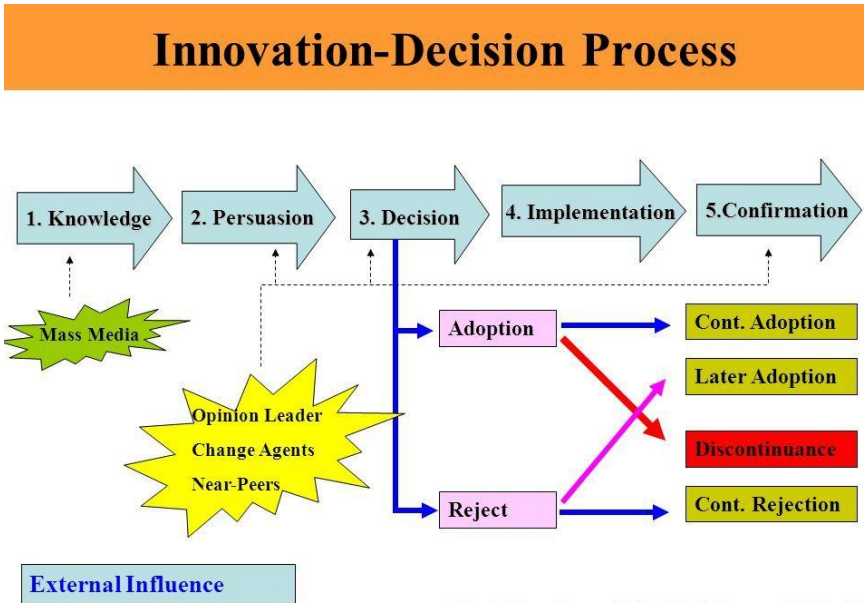
6. **Evaluation:** The individual observes performance of the innovation on other's situation. Compares performance of the new with the old one and figures out other various dimensions collects data on the performance of the innovation on changes which will be necessary if the innovation is adopted. Calculates input- output, risks, uncertainties etc.

7. **Adoption:** In this stage the individual extends use of the innovation in the time and extent.

The innovation- Decision Process

According to Rogers (1983), the **Innovation- Decision Process** is the process through which an individual or other decision –making unit passes from first knowledge of an

innovation, to forming an attitude towards the innovation, to a decision to adopt or reject, to implementation 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 practice. This behaviour consists essentially of dealing with the uncertainty that is inherently involved in deciding about a new alternative to those previously in existence. It is the perceived newness that 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.



Innovation – Decision Process

1. **Knowledge:** occurs when an individual or other decision making unit is exposed to the 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, an individual tends to expose to those ideas which are consistent with one's existing attitudes and belief, and avoids those which are in conflict with them. A need can motive an individual to seek information about an innovation and the knowledge of an innovation may develop the need.

In addition to the knowledge that an innovation exists, there may be two additional types of knowledge, how –to – do knowledge and principle – knowledge, That is, in addition

to knowing that a particular new technology exists, a farmer would like to know how and why to use it.

2. **Persuasion** occurs when an individual or 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 or unfavorable attitude towards the innovation, the individual may mentally apply the new idea to the present or anticipated future situations 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.

3. **Decision** occurs when an individual or other decision making unit engages in activities which lead to a choice to adopt or reject the innovation. The individual puts the innovation to a small- scale trial in own situation. Considering the relative advantage, risks involved and many other related factors like availability of market, need for the family etc. the individual takes a decision to adopt or reject the innovation.

4. **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.

5. **Conformation** occurs when an individual or other decision making unit seeks reinforcement of an innovation- decision already made, but may reverse this previous decision if exposed 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 the situation. If the individual perceives that the innovation is consistently giving satisfactory or unsatisfactory results, the person may continue to adopt or reject the innovation as the case may be, Reversal of the decision after adoption or rejection of an innovation may, however, take place at a later stage.

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, attitude or actions.

Rejection is a decision not to adopt an innovation. Rejection may take two forms. Active rejection, which consists of considering adoption of the innovation (including even its trial), but then deciding not to adopt it. Passive rejection (also called non- adoption), which consists of never really considering use of the innovation.

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.

Over adoption

Sometimes it may happen that people continue to adopt an innovation, rather vigorously, when experts feel that it should not be so done. This is **over adoption**. An example of this phenomenon is indiscriminate sinking of shallow tube wells in a limited area, which may result in lowering of the water table, ultimately making the irrigation system ineffective. Excessive use of pesticides is another example of over adoption.

Over adoption produces negative effect, and may cause distortion or deterioration of the related systems. Insufficient knowledge about an innovation and inability to predict its consequences generally leads to over adoption. The role of extension agent is to prevent excessive adoption of the innovation, by providing adequate knowledge about the innovation and making the client system aware of its consequences. This may be achieved by appropriate surveillance, training and communication.

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.

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.

3. ***Anticipated Vs. Unanticipated Consequences*:** It depending on whether the changes are recognized and intended by the members of a social system or not.

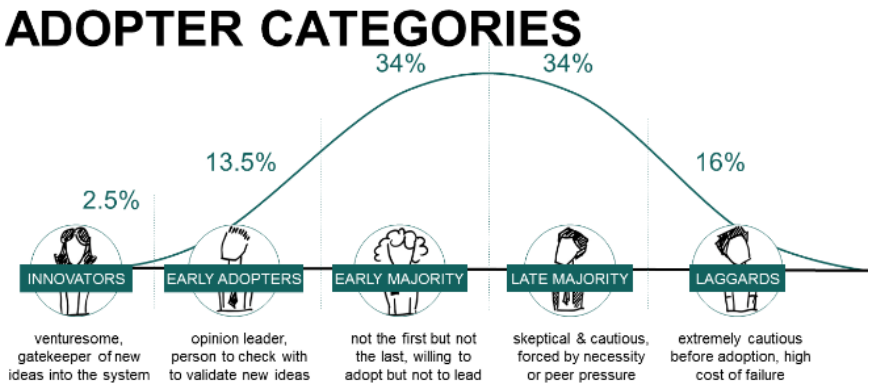
LECTURE –17

Adopter categories – Factors influencing adoption of innovations – Consequences of innovations.

Adopter Categories

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. In technology transfer programme, it is of great practical utility for the extension agents 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 a 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, accelerates to a maximum when about half of the individuals in the system have adopted, and then increase 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 learning trial by an individual.



Adopter Categories

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 and standard deviation. The area

lying to the left of the mean time of adoption minus two standard deviations includes 2.5 percent of the individuals who are the first to adopt an innovation and are known as innovators. The next 13.5 percent between the mean minus one standard deviation and the mean minus two standard deviations to adopt the new idea are called as early adopters. The next 34 percent of the adopters between the mean time of adoption and mean minus one standard deviation are known as early majority. Between the mean and mean plus one standard deviation to the right of the mean are located the next 34 percent to adopt the new idea, the late majority. The last 16 percent to the right of mean plus one standard deviation are the last to adopt the innovation, the laggards. The five adopter categories are conceptualized as ideal types. The important characteristics of the adopter categories are mentioned in brief.

1. Innovators: They are venturesome and first to adopt a new idea, much ahead of other members in the community. They are generally very few in number. They must deviate from the social norm and may be viewed as deviants by others.

They are cosmopolite and their sphere of influence and activity may go beyond the community boundaries. They are mentally alert, have good contact with cosmopolite sources of information and actively seek new ideas. They are oriented to take risk, have large size enterprise and have the financial resource to absorb any possible loss due to adoption of the innovation. They are generally literate and have more prestige in the community.

The innovators are oriented to develop good contact with the research station and high level extension functionaries.

2. Early Adaptors: 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.

Early adopters are literate, have large size enterprise, high income, more participative and maintain good contact with cosmopolite sources of information. They do not test untried ideas, but quickest to use tried ideas in their own situations.

3. Early Majority: They adopt new ideas just before the average members of the community. They are neither very early nor 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. They do not hold leadership position in adoption, but actively participate in extension programmes like training, demonstration, farmer's day, study tour etc. They are slightly above average in education, social and economic status, and experience about the enterprise. Because of their limited resources, they cannot take hasty or poor decisions.

They have less contact with the cosmopolite sources of innovation. They are active localities and associate mainly with the people of their own community. They are the 'neighbours and friends' from whom majority of the members of the community seek information about innovations.

4. Late Majority: 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 getting the benefit out of it.

They have low level of education, low level of participation and depend mostly on localite sources of information.

5. Laggards: They are traditional and the last to adopt an innovation. 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.

They are most localite and primarily interact with those who have traditional values they tend to be frankly suspicious of innovators, and extension agents. A fast moving world is shocking to them and they find it difficult to adjust with it. They do not have opinion leadership and is almost a forgotten mass of people in the community. They have little or no education, least participant and hard if any contact with the outside world.

These people are likely to belong to the backward classes, may be working as share-croppers and agricultural labourers, with very little land of their own. They are generally resource- poor people with little surplus to invest their production enterprise. They generally live in areas having least urban influence and, socially and economically the most disadvantaged.

Adoption behaviour is many times interpreted in terms of ability of the farmers to adopt a new technology. This interpretation may not be wholly correct as it does not take into account the lapses of research and extension. Technologies, for the development and dissemination of which there have been very little dialogue with the farmers, are less likely to be adopted, particularly by the resource- poor farmers. The dialogue between the proponents and participants provides an opportunity for exchange of information and experience to reach mutual understanding and is considered essential for adoption of a technology by the client system.

Factors Influencing Rate of Adoption of Innovations

It is apparent that adoption is the decision to adopt or reject an innovation. The adoption behaviour of an individual farmer is influenced by various factors. Following are some important factors.

1. *Social Factors*
2. *Personal Factors*
3. *Situational Factors*

1. ***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 communities with that of other.

a) Social Values

Social values differ from group to group and community to community. 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 confirm.

If the adoption of ideas goes contrary to the established customs and traditions of the people, the innovator/ change agent may be ridiculed and blamed. If there is greater emphasis on maintaining traditions and have 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.

b) **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 the leader in the community accepts the idea. If he accepts, he will influence all other farmers in the community to accept.

c) Social contact

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.

i) Nature of social contact: The presence of organizations whose objectives include the promotion of changes will aid directly 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.

ii) Extent of Social contact: The extent to which social contacts are confined to the immediate locality is a factor. Higher the social orientation of the people, the more likely they are to accept new ideas.

d) Social Distance

The social distance associated with wide status differences are also a factor in the diffusion of farm information through inter- personal channels. For example, tenant farmer in some areas may not get ideas from the large farm owners because of their lack of contact. Also small farmers may fail to communicate with big farmers.

2. Personal Factors

Some people adopt new ideas and practices more quickly than others because of differences in the characteristics of individuals as detailed below.

i. **Age:** In general, elderly farmers seem to be somewhat less inclined to adopt new practices than younger ones.

ii. **Education:** Many research studies conducted in social science revealed that higher the level of education more will be the rate of adoption of innovation.

iii. **Psychological characteristics:** Exposure to reliable sources of farm information may create a state of rationality which in-turn predisposes an individual to the adoption of new practices. A mentally flexible person has higher adoption rates than one with mental rigidity. Some people are found to be more prone to change than others.

iv. **Values and attitudes (Cultural Characteristics):** Values found to be positively related to farm practices adoption 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. A high emphasis on traditionalism, isolationism and security has been found to be negatively associated with adoption of improved practices.

3. Situational Factors

Some farmers adopt farm practices more quickly at one time than others relate to the situation in which they find themselves.

i. **The nature of the practices:** The speed with which adoption will take place is partly dependent on the nature of practices itself.

ii. **Complexity:** In general the more complex a practice, the more slowly it will be adopted.

   a. 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.

iii. **A simple change:** A change in materials and equipments only without a change in technique or operations.

iv. **Improved practices:** Change in existing operations with or without a change in materials or equipment e.g. change in cropping pattern.

v. **Innovation:** Change involving new techniques or operations e.g. drip irrigation.

vi. **Change in total enterprise:** e.g. from crop to livestock farming.

vii. **Cost:** Those practices with little cost seem to be adopted more rapidly than those which are more expensive. E.g. Organic fertilizers locally available.

viii. **Net returns:** Those practices which yield the greatest managerial returns per rupee invested and in the shortest time seem to be adopted most rapidly.

ix. **Relative advantage:** Comparative advantage. E.g. Tractors efficacy higher than bullock power.

x. **Compatibility:** E.g. The lack of compatibility of beef rearing for meat with cultural values in many parts of India.

xi. **Trialability (Divisibility):** New ideas that can be tried on a small scale basis 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 cannot be tried.

xii. **Observability (Communicability):** It is the degree to which the results of an innovation may be diffused to others. The results of some practices are easily observed while the results of some innovations are not easily observed. E.g. Application of nitrogenous fertilizers to plants.

xiii. **Farm Income:** High farm income associated with high adoption levels.

xiv. **Size of farm:** Size of farm is always positively related to the adoption of new farm practices.

xv. **Tenurial Status:** The adoption of innovations is more among the owner cultivators than tenant cultivators.

xvi. **Sources of farm information used:** Higher the degree of contact with information sources, higher will be the rate of adoption of innovations. A high positive correlation is particularly evident with the use of sources as government agencies. High dependence on relatives and friends as sources of information is usually negatively associated with the adoption of new farm practices.

xvii. **Levels of Living:** Since successful farm practice adoption is instrumental in providing the means of supporting a higher level of living, a positive correlation between the two would be expected and is generally found.

Consequences of Innovation – its Impact analysis

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. An innovation has little effect until it is distributed to members of a system and used by them. Thus innovation and diffusion are means to an ultimate end.

Generally, people have the wrong assumptions that every innovation will produce only beneficial results for its adopters. This is called as pro-innovation bias. But, antagonistically the innovation may have its own disadvantage also. What we refer to as anti-innovation. Every innovation produces social and economic reactions that exist throughout the social structure of the client system. Thus consequences can be categorized into six categories.

A) Desirable Consequences

These are the functional effects of an innovation to an individual or to a social system and are desirable or wanted by the people.

E.g. steel- axe experiment to hasten tree cutting.

Snow mobile recreation spot in Finland.

TV instruction led to entertainment and education about the happenings in the world.

B) Undesirable Consequences

These are the dye- functional effect of an innovation to an individual or to a social system and are undesirable and unwanted happening.

- Prostitution as a result of steel axe experiment.
- Noise pollution to nearby areas of the snow mobile recreation spot
- Destruction and denigration of the moral and social values on account of TV dissemination.

C) Direct Consequences

These are the changes to an individual or a social system that occur in immediately response to an innovation eg. yield increase of crop as a result of the direct consequences of an innovation. E.g.: Computer- data base leading to one's bank overdrafts were made known to one's higher authorities.

E.g.: Increased socio economic status.

D) Indirect consequence

These are the changes to an individual or a social system that occurs.

E**) Anticipated Consequences**

These are changes due to an innovation that are recognized and intended by the members of social systems. E.g. Growth of industry.

F**) Unanticipated Consequences**

These are changes due to an innovation that is neither intended nor recognized by the members of a social system. This is often not fully understand by the adopters of an innovation and may not be comprehend by the change agents.

Growth of Viscose – increased export – unexpectedly led to soil and water pollution due to effluents- Revolt of people- endangered to close the industry – eventually led to unemployment for the industrial employees.

G) Socio – Economic impact of Consequences

Differential adoption behaviour usually tends to widen the socio- economic gap between the early adopters and late adopters. It also widens the gap between persons of previously high and low socio – economic status. When the socio- economic structure is already unequal the introduction of an innovation, particularly a costly innovation will lead to even greater inequality and more widening. So, to narrow the gap and to have the good socio-economic impact, one must include.

1. Selection of appropriate message and interest to the particular sub audience.
2. Message design, treatment and presentation according to their education, beliefs and the like.
3. Selection of channels according to their communication habits and organizing discussion groups.
4. Identification of opinion leaders among the disadvantaged and more frequent extension agent contact with them.
5. Orienting research and development activities according to their needs.
6. Participation of these people and their leaders in planning and implementation of programmes.
7. Accessibility of credit facilities.
8. Emphasis on indigenous knowledge.

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