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AEM 103: Communication for Development (4 Credits)

BLOCK I: COMMUNICATION PROCESS

UNIT 1

COMMUNICATION: CONCEPT, PRINCIPLES AND MODELS OF COMMUNICATION

Highlights of the Unit

- Objectives
- Introduction
- Concept and Meaning of communication
- Principles of Communication
- Models of Communication
- Effective Communication – Attributes
- Conclusion
- Let's Sum up
- Check Your Progress
- Further Readings

1.0 OBJECTIVES

- To familiarize the learners with the concept and meaning of communication
- To orient the learners with the principles and models of communication

1.1. INTRODUCTION

Communication stems from the Latin word 'communis' which means "to make common", "to share" or "to transmit". It also requires a degree of commonness between individuals for communication to occur. Communication, refers to the process of sharing information, ideas in a manner that there is a common understanding of meaning, intent and use of the message. We communicate by observing, listening, speaking, writing, through gestures and even facial expressions. Without communication people would not be able to share knowledge.

There are a number of ways in which we communicate. For example, we reach our workplace and greet colleagues (spoken communication). They acknowledge with a nod (communication through gestures or non-verbal communication). When we enter our office we check incoming email and letters and respond (written communication). We participate in a meeting to discuss and review the progress of a project (group communication).

On our way back home we stop at red light (communication by visual symbols). When an ambulance horns down the street, (communication by sound) we move to the side of the road. Communication permeates our personal and professional lives.

It is evident that communication is much more than writing correctly and speaking clearly. It also requires understanding body language, voice, tone, facial expression and gestures.

1.2. CONCEPT AND MEANING OF COMMUNICATION

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 the meaning, intent and use of the message (J. Paul Leagans, 1961).

Rogers and Shoemaker (1971) defined communication as the process by which messages are transferred from a source to a receiver.

Communication can be defined as the process of transmitting information and common understanding from one person to another (Keyton, 2010).

According to Peter Drucker; "The most important thing in communication is hearing what isn't said."

Communication is the process of passing a message or information from its source to the recipient(s) in such a way that it can be understood, in order to prompt the desired response. It is a fundamental and ever-continuing process and is vital for human survival. It is the exchange of ideas, thoughts and messages. The communication process starts

with a sender/source who has a message for a receiver. The sender's message travels to the receiver through one or more channels chosen by the sender.

It is not enough to tell farmers about a new technology. They must hear it, understand it and remember it. Only when they understand it, communication is said to have produced an interest in them and it leads them to think and to act on it.

Communication is about achieving a common understanding. If understanding has not occurred, communication has not happened. A tourist in a foreign country drew a mushroom, like this to indicate at the store that he wanted mushroom.

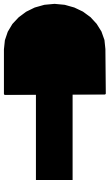


Fig 1.1 Drawing of a Mushroom

The store assistant nodded his head and returned with an umbrella. So while ideas and feelings were expressed, communication did not happen. Whatever its purpose, every communication involves at least two entities or people- a sender and receiver.

1.3 PRINCIPLES OF COMMUNICATION

Communication is a two-way process of giving information and receiving information through various channels. Whether one is speaking informally to a colleague, addressing a conference or a meeting, writing a newsletter article or formal report, the following basic principles apply:

- Know your audience.
- Know your purpose.
- Know your topic.
- Achieve credibility with your audience.
- Present information in several ways.
- Develop a practical, useful way to get feedback.
- Use multiple communication techniques.

1.4 MODELS OF COMMUNICATION

Models are symbolic representation of structures, objects or operations. 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 explaining the working of a system.

Communication models serve three main purposes-

i. they describe the process of communication

ii. they visually show the relationship among the variables involved in communication and

iii. they aid in finding and correcting communication problems

There are many models of communication developed by noted theorists. Models provide an insight into the various perspectives of communication. In any model of communication, we can find elements of the communication process. Some of the models are detailed here:

1.4.1 Aristotle's communication model

Aristotle (384-322 B.C.) was the first to give the linear communication model. His model of communication is formed with 5 basic elements: (i) Speaker, (ii) Speech, (iii) Occasion, (iv) Audience and (v) Effect. Aristotle advises speakers to build speech for different audiences on different occasions and for different effects.

The role of feedback was not included. In this model the sender is an active participant and the receiver is passive.

1.4.2. Lasswell's Model

Lasswell in 1948 put forth a linear model of communication. This model includes the following components i) Who (Communicator), ii) Says what (message), iii) In which channel (medium), iv) To whom (receiver), v) Under what circumstances and vi) With what effects (effect).

This model provides an explanation for linear, one-way communication. This model gives importance to the communicator and his message but like Aristotle's model, the element of feedback was missing.

1.4.3 Shannon and Weaver Model

Claude Shannon and Warren Weaver's model (1948) contains an information Source, which usually yields a message; a Transmitter, which encodes a particular communication into signals suitable for transmission; a Channel, which carries signals to the receiver; a Receiver, which transfers the signals to the Destination – the final consumer of the message. In this model, they indicated a sixth element, noise as a dysfunctional factor. The model is shown below:

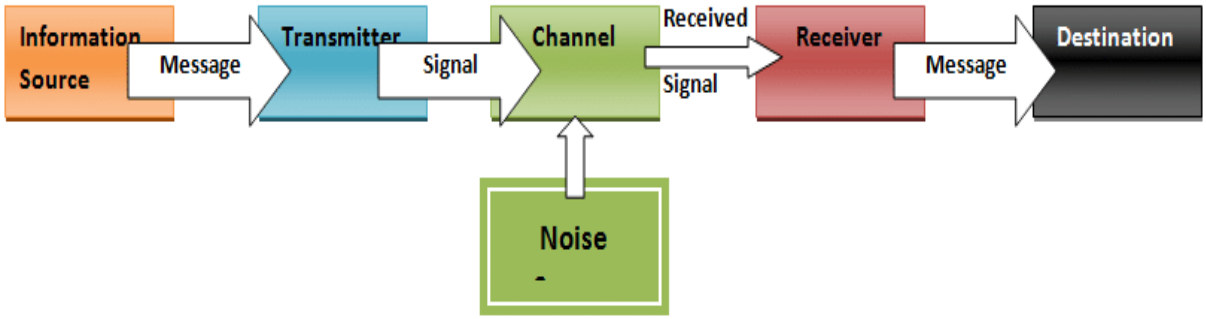


Fig 1. 2 Shannon and Weaver's Model

1.4.4 Berlo's model

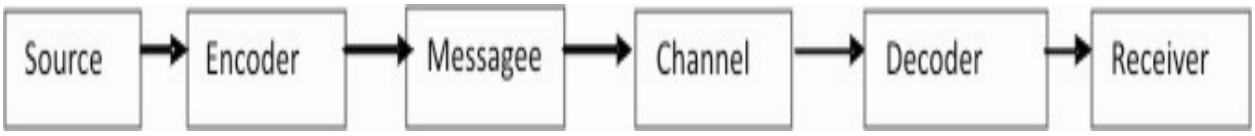


Fig 1.3 Berlo's Model

According to Berlo (1960) the model of communication includes the following elements: Source; Encoder; Message; Channel; Decoder and Receiver.

According to this model, any communication has some source. The source has ideas, information, and a purpose for communicating which is expressed in terms of a message. The encoder codifies ideas into meaningful message which is carried through an effective medium

or channel, chosen by the source. The receiver decodes the message and converts it in a form that it can be easily understood.

1.4.5 Leagan's model

The communication model given by Leagan (1963) has the following elements - Communicator; Message; Channel; Treatment of message; Audience and Audience Response.

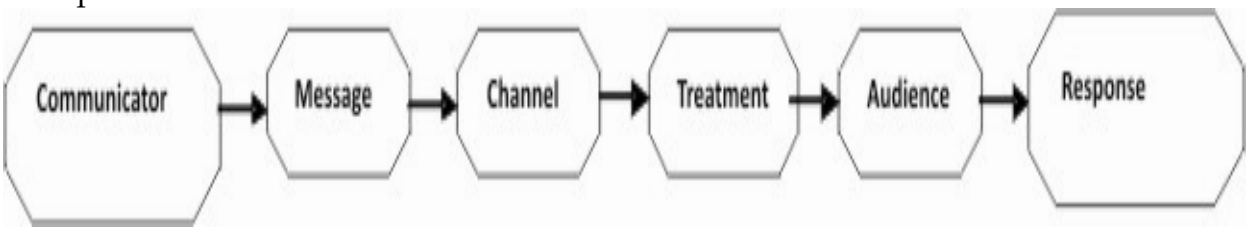


Fig 1.4. Leagan's Model

The task of communication, according to Leagan 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. More emphasis is on treatment of the message and audience response/feedback.

1.4.6 Schramm's Model

According to Schramm's model of communication, there is a source, who encodes a signal and there is a receiver, who decodes the signal. Maximum output from communication can be achieved based on the common experience of both the source and the receiver.

As per this model, both an encoder and a decoder receives and transmits. A person will decode a message, interpret based on past experience and then encode a response accordingly. Thus each one is constantly communicating back to the other and the return process is termed as feedback.

1.5 EFFECTIVE COMMUNICATION - ATTRIBUTES

For a communication to be effective, the following points should be kept in mind. It will enhance the chance of the message being understood in the way it was intended.

Completeness: Communication must be complete. It should convey all the facts required by an audience. No crucial information should be missing. A complete communication leaves no question in the mind of a receiver. There should be enough information to enable readers to use the technology or practice it successfully after following the instructions. Important items should be included and all the steps in a process should be covered with enough detail. Complete communication helps in better decision-making by audience/ readers/ receivers of message as they get all the desired and crucial information. It persuades audience.

Concreteness: Concrete and specific expressions are to be preferred in favour of vague and abstract expressions. It should say when a particular technology or policy is appropriate? When it should not be used (Ex: on which soils, at what altitude) and give an indication of costs and benefits. Abstract or vague statements can cloud the mind of the sender. Instead of stating "Per capita income rose slightly", if the sender made the following statement: "Per capita income rose by 3% every year", the receiver is more apt to listen and comprehend the details. Concrete message is supported with specific facts and figures; it makes use of words that are clear and concrete messages are not misinterpreted.

Conciseness: The message to be communicated should be as brief and concise as possible. As far as possible, only simple and brief statements should be made. Excessive information can also sway the receiver into either a wrong direction or into inaction. Quantum of information should be just right, neither too much nor too little. Concise communication is both time-saving as well as cost-saving. It underlines and highlights the main message, as it avoids using excessive and needless words. Concise communication provides a short and essential message in limited words to the audience.

A concise message is more appealing and comprehensible to the audience and is non-repetitive in nature.

Clarity: Clarity of ideas adds much to the meaning of the message. As far as possible, simple language and easy sentence structure, which are not difficult for the receiver to grasp, should be used. Scientific terms can be made simpler and jargon should be avoided. Clarity in communication enhances meaning of the message. A clear message makes use of exact, appropriate and concrete words.

Correctness: There should be accuracy of facts and figures being used. The information must be truthful and accurate and the statements should be scientifically justifiable. The usage of terms should be non-discriminatory. In correct communication, the message is exact, correct and well-timed; a correct message has greater impact on the audience/readers; it checks for precision and accuracy of facts and figures used in the message and makes use of appropriate and correct language in the message.

Courtesy: Courtesy implies taking into consideration the view points and feelings of the receiver of the message. A courteous message is positive and focused at the audience. It makes use of terms showing respect for the receiver of message and it is not biased. Courteous communication is also open and honest.

Coherence: Communication which is coherent, is logical. All points are connected and relevant to the main topic and there is consistency in the content.

1.6 LET'S SUM UP

In this unit, we looked at the meaning and principles of communication and understood that communication is a process by which two or more people exchange ideas, facts, feelings or impressions in such a way that each gains a common understanding of the message. It is clear that successful communication requires a skillful communicator sending a message through proper channels to an appropriate audience that responds as desired. The attributes of an effective communication was also elaborated for better understanding of the learners.

1.7 CHECK YOUR PROGRESS:

1. Study the communication models and identify the common elements in them.
2. What are the attributes of an effective Communication?

1.8 REFERENCES/FURTHER READING

1. Dahama, O.P. and Bhatnagar, O.P. (2007). Education and Communication for Development. Oxford and IBH Pub. Co. Pvt. Ltd.
2. Keyton, J. (2010). Case studies for organizational communication: Understanding communication processes. New York, NY: Oxford University Press.
3. Leagans, J. Paul. 1961. The Communication Process in Rural Development. Cornell University Press. 35 p.
4. Rogers, E.M. and Shoemakers, F.F. 1971. Communication of Innovation: A cross cultural approach. New York: Free Press. 476 p.

UNIT-2

COMMUNICATION PROCESS AND ELEMENTS OF COMMUNICATION

Highlights of the Unit

- Objectives
- Introduction
- Communication Process
- Elements of Communication
- Conclusion
- Let's sum up
- Check Your Progress
- Further Readings

2.0 OBJECTIVES:

- To develop conceptual understanding among learners about communication process and its functions.
- To orient the learners about elements of communication process

2.1 INTRODUCTION

Communication can be understood as the process of exchange of ideas, facts, opinions, etc. The process involves sharing of meanings and developing an understanding between two or more people.

2.2 COMMUNICATION PROCESS

Communication is a two way process, involving at least two persons — a sender and a receiver—irrespective of the mode of communication. The sender conceives the idea, gives it a shape, decides the mode or channel of communication which may be used to convey the idea and conveys it. The receiver receives it, tries to understand it and finally takes action which may be either to store the information or to send the message to the original source or take any other line of action as required by the source.

The Communication process follows in the sequence as mentioned below:

***Developing an idea*:** The sender perceives that he/she has some important message to be conveyed to the receiver.

***Encoding the message*:** Encoding refers to conversion of thoughts of the sender into a form in which they can be transmitted through a channel. The message that develops in the mind of the sender has to be encoded before it can reach the intended person(s). The process of conversion of the subject matter into symbols is called encoding. In other words, it involves changing an intangible and abstract entity into something that can be shared with another person and be understood. Transmission of message requires use of certain symbols. A communicator plans and organizes his/her ideas into symbols, signs, words, actions, pictures and audio-visuals to ensure that it reaches the receiver. It is up to the sender to select a medium that one feels appropriate to communicate effectively to the intended listener or receiver.

The sender codifies the message selecting appropriate words, figures, charts or symbols, to convey an idea as clearly as possible. The sender also decides on the medium of transmission so that the words and symbols constituting the message can be organized in a suitable manner.

Transmitting the message: This step involves transmission of the message using an appropriate medium of communication such as letter, phone call or personal interaction. While transmitting the message, a sender tries to ensure that the timing of the message is right. A sender also takes care that transmission of the message doesn't encounter any barriers or interference, which may impede the flow of communication. Ensuring that the communication channel is free from barriers or interference increases the chance of the message reaching the target audience and holding their attention.

***Reception of the message**:* The receiver, the person for whom the message was intended, receives the message. If a message is communicated orally, the receiver has to be a good listener in order to avoid loss of information during transmission of the message.

***Decoding the message*:** The message is decoded and understood by the receiver.

Decoding may be defined as the process of conversion of an encoded message. The receiver converts the symbols, words or signs received from the sender to get meaning of the message.

Decoding may also be understood as assigning meanings by the receiver to the signs and symbols sent by the sender.

Acceptance or rejection of the message: A receiver is free to accept or reject the decoded message. The receiver can also decide whether to accept the message fully or in part. The acceptance decision of the receiver is influenced by factors such as his perception regarding accuracy of the message, authority of the sender and the implications of accepting the information.

***Feedback*:** Feedback occurs when a receiver sends back some response to the sender or acknowledges receipt of the message. The communication loop is complete only after feedback has been provided.

The exchange of meanings is not complete unless the information goes back to the communicator from the receiver. Feedback enables the sender to know whether his/ her message has been understood correctly by the receiver or not. Feedback is the response of the receiver to the message sent by the sender. It ensures that the receiver has received the message and understood it in the same manner in which it was intended by the sender. Feedback allows a communicator to carry out corrections, amendments or change the message to make it more effective. Just like the message, feedback can be verbal or non-verbal.

The process of communication performs several functions. These are:

1) **Information Function:** Information function refers to sharing of knowledge and involves collection, storage, processing and dissemination of data, facts etc. that is required in order to understand, react and adjust to the ever changing environment.
2) **Instruction/ Education Function:** This refers to the transmission of knowledge which leads to intellectual development and acquisition of skills that enables a person to function as an effective member of the society.
3) **Socialization Function**: Socialization function of communication may be understood as bringing about an order in the society by fostering social cohesion among the members of a society. This is accomplished by creating awareness about social norms and values.

4) **Persuasion Function:** One of the main objectives of communication is to influence others. This may involve an attempt to change the beliefs, values, orientation etc. of others in a direction deemed desirable by the speaker or to make them act in a certain manner.

5) **Integration Function:** A major function of communication is to bring about a sense of belongingness among the members of the social system. Rituals, literature, folklore, beliefs etc. help in fostering a sense of togetherness.

6) **Entertainment Function:** Communication entertains members of the society and provides an opportunity to diffuse tension and stress. Literature, music, drama, dance, art, comedy, sports etc. provide avenues for personal as well as collective recreation.

7) **Discussion Function:** It provides an opportunity for exchange of views, facts and information that is needed for consensus building and collective action.

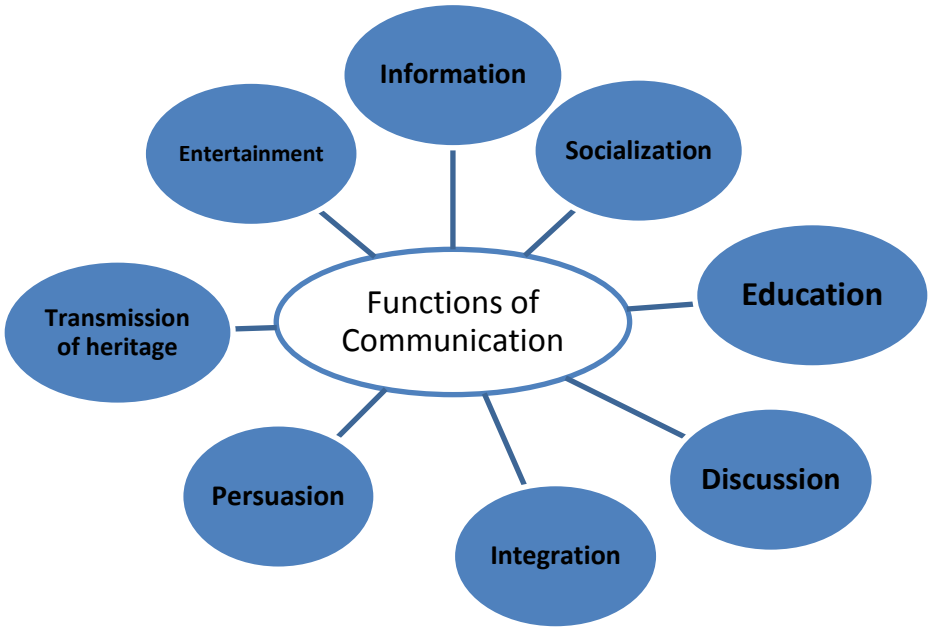


Figure 2.1: Functions of Communication

8) **Transmission of Heritage:** This function involves dissemination of cultural and artistic products for the purpose of preserving the heritage of the past. Transmission function occurs both spatially and temporally.

2.3 ELEMENTS OF COMMUNICATION

Communication task thus consists of the skillful handling of six key elements – Communicator,

Message, Channel, Treatment of Message, Audience/Receiver and Response of the Audience/Feedback. These elements show their singular function, their relationship to each other and how they are to be dealt within the entire process of communication.

2.3.1 Communicator

A communicator is an individual or a group or an institution responsible for initiating communication and transmitting the message, ensuring that the objectives of the exercise are clearly defined and achieved. The objective refers to what the communicator expects to accomplish. A communicator may be interested in bringing about desirable changes in behavior of the target audience.

Successful communication requires a skillful **communicator** sending a useful **message** through proper **channels** to an appropriate **audience** that **responds** as desired. Taking an example from agriculture sector: An Extension Worker is the communicator who starts the process of communication. Knowledge is generated through research and research institutes; universities are the originators of sources of message. An extension worker obtains the required information from research and carries it to the audience - the farmers. The extension worker is the communicator, a carrier of information. To enhance the process, extension workers may take help of audio-visual aids. They also carry back reactions of the farmers, their problems etc.as feedback to researchers, for finding out solutions for the same.

2.3.2 Message

One of the fundamental problems surrounding effective communication is the exact reproduction or close approximation of the same from one point to another point. A message is the content of communication sent by a communicator to achieve the objective(s) of communication. A message is the information a communicator wishes his audience to receive, understand, accept and act upon. Message plays critical role in the process and determines the extent to which ideas, facts, opinions and meanings are understood by a receiver. Message is the most fundamental component of the process of communication. Any message drafted without understanding the principles of messaging will lead to corruption of the message and subsequent errors in its understanding. A message is considered to be the heart of the communication process and must be formulated with utmost care, sensitivity, and empathy. While developing a message, a sender should be aware of all the possible elements of distortion at each step of communication. A

message must carry sufficient redundancy to ensure that it survives attrition through the channel but is still able to trigger the action it was intended for, in the receiver's mind.

An Extension officer may send a message to the farmers on benefits of livestock farming. Message must be clear, useful to the audience, relevant to the receiver and timely with respect to their livelihood activities. This implies that the message sent must be technically feasible, economically beneficial and acceptable.

Messages which are relevant, interesting, useful, profitable, credible (latest and best, based on research findings) and complete are likely to motivate people. A good message clearly states what to do, how to do, when to do and what would be the result.

A message may be best defined as a sign or a symbol that has common meaning for both, the sender and the receiver. Signs and symbols have both denotative and connotative meanings. Denotative meaning refers to the dictionary meaning or definition of a word. On the other hand, connotative meaning refers to the feelings and emotions attached to a word. For example, the denotative meaning of the word "Rose" is a flower that belongs to a particular family. The connotative meaning of the same word is beauty and love.

Message may be verbal or non-verbal. Verbal message uses words that are either spoken or written and passed on from one person to another and may involve any fact, idea, opinion, attitude etc. On the other hand, non-verbal messages are actions without words. They cover a wide range and include as diverse components as gestures to the way we dress or the artifacts we use.

Another important thing to remember is that a message may be intended or unintended. Especially in case of non-verbal message, the sender may not fully comprehend the message he/she is sending out. It is important for the sender to be fully aware that the receiver may decode the message in a manner that was not intended by the sender. For example, instead of using familiar terms with farmers in a specific location, an officer may be using technical terms which a farmer may not understand. Another example is, an agricultural officer may ask a farmer why he did not adopt a certain technology just to know if there are any problems with the technology or there are gaps in technology/ knowledge transfer, but the farmer may interpret it as criticism. Initially, a message only exists in the mind of the communicator.

2.3.3 Channel

Channel of communication refers to the medium through which a message travels to reach the receiver. A sender has a number of channels available to him/her but the choice of which one to use depends on a number of factors. A communicator has to decide how best he can pass the message that he wish to convey. It can be oral, written, non-verbal, audio-visual, etc. While selecting the channel, a sender has to keep two things in mind. Firstly, the channel should be available or accessible to the receiver. Also, he/ she should choose a channel that is suitable for transmitting the message designed by the sender.

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

According to form

- **Spoken:** Farm and home visit, farmer's call, meetings, radio talk etc.
- **Written:** Personal letter, farm publications, leaflets, newspaper etc.
- **Visual:** Exhibitions, posters, charts, slides, photographs, demonstration
- **Audio visual:** Television, puppet shows, drama/ songs

According to nature of contact with the people

Individual contact: An extension agent communicates with the people individually. Examples are farm and home visit, farmer's call, personal letter etc.

Group contact: An extension agent communicates with the people in groups and not as individuals. Examples are group meeting, small group training, field day or farmer's day, study tour etc.

Mass contact: An 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.

2.3.4 Treatment of message

The way a message is put across within a channel is called treatment of message. The purpose is to make the message clear and understandable to the audience. Treatment has to do with

the way a message is handled to get the information across to an audience. It relates to the technique or manner of presenting messages. Treatment usually requires skills in creating and using refined techniques of message presentation.

The most important factor while selecting content of the message is to look for the needs and aspirations of the people. Only those messages, which are selected according to the needs of the receiver, are considered important and valuable by them. For effective communication, a message has to be simple, accurate, and reliable, fit into social and cultural norms of the society, should not arouse negative feelings and be at the level of understanding of the audience.

The same content can be presented in several ways. For example, a journalist covering pest attack on a crop, may take a human interest angle, investigative slant, informative piece etc. depending upon what he thinks will be interesting to his readers. The journalist may select the words and then structure the information in a manner he thinks his readers would prefer to read.

2.3.4.1 Characteristics of an effective message

A message that has the intended effect on the receiver may be considered as an effective message. An effective message must fulfill the function for which communication process was undertaken in the first place. Wilbur Schramm suggested that for any communication to be transmitted effectively from source to receiver, irrespective of the context and situation, the message must meet the following requirements:

a) A message must be designed and delivered so as to gain attention of the receiver. Any message that fails to attract attention of the receiver is unlikely to have any impact.

b) A message must use signs and symbols that are understood in the same way by both the source and the receiver. As we all know, the same word may be used by different communities to mean different things. This can often lead to miscommunication or communication breakdown. This aspect of the message becomes very critical during cross-cultural communication.

c) It must lead to satisfy a receiver's needs. The need may be to search for more information on a particular topic, motivation to act in a certain way etc. A message that does not result in any further action or reaction is of little use and cannot be called as an effective message.

An effective message has certain characteristics.

These include:

a) **Credible:** Credibility refers to trustworthiness of a message. It is a claim of fact and tries to convince a receiver that the message is factually correct. In other words, credibility is the believability aspect of the message. Credibility means that the message is factually accurate, provides information to back up assertions and is delivered by people that are trusted on the subject. A source can enhance believability of the message in several ways. They can state their affiliation and credentials, experience with the topic, give data and figures to support their claims. The last aspect is especially important in informative messages.

b) **Concise:** An effective message is concise. In other words, it is to the point and brief. People are able to understand and remember crisp messages easily. While certain degree of repetition is essential for message designing, it should not be too long and go into the most irrelevant facts or details. If a message is too long the concentration is affected and they lose interest. Another point to keep in mind is that to not load the audience with too many facts, figures and data. They will soon lose interest or comprehend very little.

c) **Relevant:** A message should be also be relevant to the audience. It should meet their interests and needs. A message that fails to serve any purpose is an ineffective message and a waste of time. In case of development message, relevance is very critical and can determine the outcome of the interventions. For example, if management practices of a high yielding variety of rice is communicated to a farmer in the arid regions of Rajasthan, then it is of no relevance to him/ her.

d) **Compelling:** An effective message should be compelling. It should touch people in such a way that they are inspired to act. A message that is not able to induce the desired change is not an effective message. However, this aspect is not only confined to persuasive messages, but is also applicable to informative messages. If an audience does not act on the basis of the information they had acquired, then the message is of little value.

e) **Complete**: A message should be adequate. A message that is incomplete or has gaps is difficult to understand. Incomplete message may lead to misunderstanding the subject by the receiver, delay in decision making process and action may be stalled.

f) **Consistent**: Consistency refers to uniformity of the message. A message that is sent by a sender, should not have inherent contradictions. A message is said to be consistent when different parts of the message convey the same meaning or view point. Consistency can be achieved if a communicator keeps in mind the broad topic/area and one part of the message is linked to the other smoothly. Conflicting ideas within the same message and inconsistency create confusion and chaos in the minds of the receivers.

g) **Timely:** Timeliness refers to the delivery of a message by a sender when it is actually required. The main aim of communication is to ensure that a message reaches the audience at appropriate time. A message that is not conveyed at the right time loses its value. Sending a message before or after the time will not serve the purpose of communication. A message that has been sent before time may be forgotten by the audience and they may not act upon it. On the other hand, a delayed message has no importance. For example, if an agriculture department conducts training program on *Rabi* crops in April, it will be of little use to the farmers as they will be sowing those crops after six months.

h) **Simple**: Always simplify a message for the audience by focusing on the key aspects of the message. A sender should avoid using superfluous words, unnecessary prepositions and technical jargon. Use of familiar and simple words increases effectiveness of the message. To achieve this, a sender must be aware of the receiver's vocabulary, knowledge and understanding capacity. Simplicity is always preferable because the objective of any communication is to make others understand and act on it.

According to the American Management Association, Ten Commandments of a good message designing and delivery are as follows:

1) **Examine the true purpose of communication:** A sender of the message should be clear about the purpose of message and what he/ she wants to accomplish. The purpose can be informing your audience, persuading them or just entertaining them. The structure, length and treatment of the message will vary according to the primary purpose. While one may try to accomplish more than one purpose, it is always better to confine to a single purpose, so as to not confuse the audience.

2) **Clarify ideas before communicating:** A sender has to be clear about what to communicate and who the receivers will be. This will help a sender in planning the message and deliver it accordingly. A well-structured and systematically planned message is better understood by an audience as it is likely to face fewer barriers and distortions.

3) **Consider the entire environment:** A sender should be aware of both the physical and the human factors while designing a message. It can simply involve considering whether or not a particular equipment is available while preparing an audio-visual aid that is an integral part of the message. Besides this, physical settings, social climate and timing are also important considerations. Always try to learn from your past communication practices. What did not work on previous occasions, is unlikely to have the desired effect next time. For example, if a joke fell flat during the previous speech, try to avoid using it in subsequent speeches and search for a better alternative.

4) **Consult others during the planning stage:** Discussing your proposed message with others can give valuable insights into the quality of the message. This is especially required if your message concerns a specialized field of knowledge. Others can check the message for accuracy and update knowledge on the topic. It is also a good idea to consult others on whether your planned message delivery is satisfactory or not. Often, a sender views his/her message in a more positive light therefore an unbiased opinion is helpful in designing and delivering an effective message.

5) **Beware of the various meanings attached to words:** Signs and symbols have both denotative (dictionary meaning) and connotative (associated meaning; feelings and emotions attached to a word) meanings. It is important to get the denotative meaning right. But equally important is the connotative meaning that a receiver may attach to the words that you have used. It is essential to be aware and cautious about the overtones as well as the basic content of the message. The receiver will be affected not only by what is said but also by how it is said and its multiple meanings. Voice tone, facial expressions and choice of language all influence a listener's reaction to the message.

6) **Link the message and its usefulness to the day to day situation of the receiver:** People pay more attention to and remember things that are useful to them. So the challenge before a good

communicator while designing a message is, how to make even abstract ideas and difficult information useful from the point of view of the receiver.

7) **Build in feedback mechanism:** A good message incorporates space for feedback both during and after the message delivery. Feedback gives the sender an idea about the understandability of the message and its correctness. It is always better not to wait till the end of the message to get a feedback, because if a receiver has not correctly understood a critical point in between, he/ she will not be able to understand the rest of the message. However, these in-between feedback loops should not distract an audience. Various mechanisms like Question and Answer sessions, Quiz, Recap, etc. can be used to elicit feedback from an audience.

8) **Connect the message to the future and the past:** No topic exists in isolation. While the sender should always choose a topic that is of current value to the receiver, one should not forget that it can be linked to the future and the past. This gives the audience a continuity of thought and they will be able to appreciate the topic more. For example, if you are giving a talk on *'Climate change and its impact on agriculture'*, the audience will be highly benefitted by knowing the history about determinants of climate change and how addressing it can have a positive impact on agriculture in the future. This approach also highlights the expertise and credibility of the sender.

9) **Message should go hand in hand with actions:** At no point during the communication, should there be a contradiction in the action of a communicator or what he /she is demonstrating. Any such discrepancy is likely to create confusion in the minds of the receiver and lead to loss of credibility of the sender. In worst case, the receiver may totally ignore or discount the message. For example, if an instructor is demonstrating grafting and he places a straight cut instead of a slant cut as mentioned during the lecture, the receiver will be confused and may follow the wrong procedure.

10) **Be conscious of the audience:** Effectiveness of the message depends on the extent to which a sender is able to tweak it to the situation. Very often, he/ she may have to improvise because the conditions are not what were anticipated. This is possible only if a sender is aware of the surroundings and conscious of the audience. Any message that is not open to alterations as per the communication situation is not an effective message.

2.3.5 Audience or Receiver

Audience is the intended beneficiary of the message. The effect of communication is felt when a receiver decodes the message (attaches meaning to the symbols) and develops an idea in his/her mind which he/she may or may not use. It is the receiver who tries to interpret, perceive, understand and act upon the message. A receiver must understand the signal very well so that he/she may understand the right meaning of that signal. Attitude of the audience towards the message largely depends upon the extent to which the content of the message satisfies their needs and expectations.

2.3.6 Audience response / Feedback

Communication is a two way cyclic process. The exchange of meanings is not complete unless the information goes back to the communicator from the receiver. Feedback lets the sender know whether his/ her message had been understood properly by the receiver or not. Feedback is the response of the receiver to the message sent by the sender. It ensures that the receiver has received the message and understood it in the same manner in which it was intended by the sender. Feedback allows a communicator to carry out corrections or amendments or change the message to make it more effective. Just like the message, feedback can be verbal or non-verbal.

Response or feedback of the audience to the message is the ultimate objective of any communication function. Feedback affects the source or communicator and exerts control over future messages. Feedback is an important indicator of the success of communication as well as areas requiring modification and further enquiry. Feedback should be a continuous process as audience and communicators are neither always the same persons nor are interacting in the same situation. There may be different kinds of responses to messages received. A communicator should take steps to analyze feedback of the audience, which may be positive, negative or neutral. If there is a neutral or negative response, a communicator/ extension agent should find reasons for the same. If it pertains to research, the problem should be referred as feedback information to researchers to find out the solutions for the same. Adequate and correct feedback is essential for purposeful communication.

Response of an audience to messages received may be in the form of some kind of action. Until the desired action results, extension communication does not achieve it’s the most essential

objective.

2.3.7 Evaluation

Evaluation is measuring effectiveness of communication with special reference to the objectives of communication set forth. Evaluation is a very important part of the communication process and is usually guided by the goals and objectives set early in the planning. It is an important way to find mistakes and improve communication efforts in future. The main reason for evaluating is to determine what worked well and what did not.

2.3.8 Noise (Distortion)

Noise is anything that disrupts the communication process and decreases its efficiency. Distortion of message refers to a situation when the message sent by a sender is not decoded in the intended manner by the receiver. Noise prevents the correct and effective transmission of the message from a sender to a receiver. In other words, it is anything that distorts or reduces accuracy or fidelity of the message. An important part of communication is to see that a message is received at the destination without distortion or with minimum distortion.

Noise is of three types; viz: physical, personal and semantic. Semantic noise is especially important in the context of message designing. It occurs when a sender is using a language that is not understood by a receiver, uses technical jargon or emotionally charged words. For example, one of the often repeated complaints about scientific articles is that they are written by people who do not explain things in a simple, everyday language that can be understood by a common man.

Distortion (noise) occurs when a message is interpreted incorrectly. This may occur due to a number of reasons. It is important to remember that no communication process is 100 percent noise free. But a sender should always try to minimize the extent of distortion.

Many obstructions can enter channels. These prevent message from being heard by or carried over clearly to the audience or understood. ‘Noise’ emerges from a wide range of sources and may be caused due to failure of a channel, poor communication skills of a communicator, physical distraction, and poor attention of audience, poor treatment of the message and poor encoding and decoding.

Some of the causes are:

1. Failure of the channel to reach the intended audience.
2. Failure on the part of the communicator to handle channels skillfully.
3. Failure to use channels appropriate to the objectives of a communicator.
4. Failure of an audience to listen or look carefully.
5. Use of too many channels.

Noise or barriers to communication may also be due to:

- Language
- Technical content
- Lack of understanding of what a receiver wants or needs
- Semantics
- Assumptions
- Inadequate feedback
- Emotional interference
- The degree of knowledge and expertise of the sender and the receiver
- The quality of the information sent
- The use of an inappropriate medium
- Lack of trust or honesty in the source
- Cultural differences
- Poor/selective listening skills

There can be various sources of noise in communication that can cause distortions. The sender himself/ herself can be a source of noise and cause message distortion. A sender may cause message distortion if he/ she is unable to encode the message properly. Sometimes the meaning may not be effectively represented by symbols used by a sender. All messages are transmitted for an intended receiver(s). The function of this receiver(s) is to decode it and attach meaning to it. Just as encoding may be done wrongly by a sender, the receiver may decode the message incorrectly. Several factors influence encoding and decoding of messages. These include communication skills, attitudes, experience, environmental and socio-cultural factors.

Message distortion can occur if sufficient redundancy/ repetition is not built into the message. The message has to be communicated in sufficient ways and sufficient number of times to avoid wrong interpretation by a receiver. Redundancy consists of repeating an important point for the receivers and highlighting the key points. Distortion can also be caused by message load. The value of the subject matter to be handled is called "message/ information load". In other words, message/ information load means the quantity and complexity of the message received by a receiver. The message load may be under-loaded or over loaded. The message which is too little is called under-loaded or less than the information handling capacity of a receiver. On the other hand, a message which is too much for a receiver to handle is called over loaded and cause information fatigue among the receivers. When receivers are constantly overloaded with messages, they shut off mentally and pay little attention to the information that is coming their way.

Perception is a mental process through which an individual receives sensory inputs and attributes meaning to them. Perception is always subjective and situation specific. Inputs that are perceived in a certain manner by one individual generally differs from that of others and also from objective reality. Interpretation of the words, symbols and images etc. which constitute a message often differs from person to person. The same message may be decoded differently by different receivers due to perceptual differences.

Distortion of the message and its meaning can also be caused by intentional/ unintentional filtering of the message by a receiver. Filtering in the context of communication, refers to partial interpretation/decoding of the message. When a message is transmitted through translation, explanation and simplification, some parts of it gets filtered and hence distorted. When an idea passes through the mind some pieces of the information are ignored or filtered out while others are added. This can happen especially when a message or parts of it are incompatible with the values, beliefs and norms of a receiver. A receiver may distort the message to suit his/ her situation and to avoid dissonance.

Sharpening is another filter which distorts message. This kind of distortion happens when a listener or a receiver magnifies or exaggerates information. This leads to disproportionate blowing up of the facts than what was intended or perceived by a sender. For example, a news report on earthquake may mention "large number of casualties" and this may be decoded by the receiver as "thousands of deaths". Assimilation is yet another type of filtering that can also cause distortion of

a message. In assimilation, the mind of a receiver is preconditioned/ programmed for a particular interpretation and behavior. In this case, a receiver attaches meaning to the message which the sender had not intended. This is often due to the inherent bias of a receiver towards a particular person, issue, thing etc.

To help overcome some of the problems of communication, one should take the following factors into account:

i. The specific objective of the message.

ii. The nature of the message – degree of directness versus abstractness, level of difficulty, scope, timing etc.

iii. The audience – size, need, interest, knowledge of the subject etc.

iv. Channels available to reach an audience.

v. How channels can be combined and used parallel.

vi. Relative cost of channels in relation to anticipated effectiveness.

vii. Time available to a communicator and to the audience.

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

2.4 CONCLUSION

Thus communication is a two way process, involving at least two persons — a sender and a receiver—irrespective of the mode of communication. Communication consists of the skillful handling of six key elements – Communicator, Message, Channel, Treatment of Message, Audience/ Receiver and Response of the Audience/ Feedback. Sometimes there is disruption in the communication process and distortion of the message due to noise. Noise prevents correct and effective transmission of a message from a sender to a receiver. The important part of communication is to ensure that the message is received without distortion or with minimum distortion.

2.5 LET'S SUM UP

Communication is the process of sharing meanings and developing an understanding between two or more people. It performs eight functions. These are: information, persuasion, education, entertainment, integration, socialization, transmission of heritage and discussion. The process of communication consists of sender, message, channel, receiver, feedback. Message treatment can be defined as decisions, which a communicator takes in selection and arrangement of codes and content of the message. An effective message is credible, concise, relevant, compelling, complete, consistent, timely and simple. Distortion of message refers to any situation when the message sent by a sender is not decoded in the intended manner by a receiver.

2.6 CHECK YOUR PROGRESS

1. Define "Communication". List its various functions.
2. Explain various elements of communication with everyday examples.
3. What factors should a sender keep in mind while designing a message?
4. Explain "Distortion of Message" with appropriate examples.

2.7 FURTHER READINGS/ REFERENCES

1. Barker, L. and Gaut,D. (2002) *Communication*. Boston: Allyn and Bacon.
2. Rayudu,C.S. (2002) *Communication*. New Delhi: Himalaya Publishing House.
3. Young,K.S. and Travis,H.P. (2008) *Oral Communication*. Illinois, USA: Waveland.

UNIT-3

FIDELITY OF COMMUNICATION, CREDIBILITY, COMMUNICATION, COMPETENCE, COMMUNICATION EFFECTIVENESS, EMPATHY AND FEEDBACK

Highlights of the Unit

- Objectives
- Introduction
- Communication Fidelity, Credibility, Competence, Effectiveness
- Empathy
- Feedback
- Let's Sum up
- Check Your Progress
- Further Readings/ References

3.0 OBJECTIVES

- To develop conceptual understanding about the factors that affect fidelity in communication.
- To familiarize the learners about the concept of credibility, communication competence, communication effectiveness, empathy and feedback.

3.1 INTRODUCTION

Fidelity of communication refers to the faithful performance of communication process by all its elements, say communicator, message, channel and receiver (Berlo, 1960). Fidelity of communication represents the degree of correspondence between the meaning intended by sender of a message and the meaning understood by a receiver. It also refers to communication of ideas by one person in a way that results in the construction of congruent ideas by the recipient of that communication.

3.2 COMMUNICATION FIDELITY

In any communication process, fidelity depends on how various elements perform and it can be maximized if all the elements of process perform faithfully. In order to ensure maximum fidelity various elements shall perform as follows:

3.2.1 The Communicator

Communication source or a communicator should have the following characteristics for having the highest fidelity:

- Clarity in objectives or purpose of communication.
- Clarity in the message to be communicated- its content, significance, validity, importance etc.
- Ability to select a message and the proper encoding skill.
- Information about the receiver or audience and the ability to engage them.
- Knowledge of the communication process and purpose of communication.
- Selection of communication channels and the knowledge of their use.
- Ability of evaluating the response.
- Patience to listen to the message of others.
- Skills to find out the causes of communication loss and to minimize them.
- Sufficient knowledge of the subject.

3.2.2 Message or Content

The message should have the following characteristics for having the highest fidelity -

- It should be in line with the objectives to be achieved.
- Clearly understandable by the audience.
- Relate to the audience's intellectual, social, economic and physical capability.
- According to the traditions, needs and desires of the audience.
- Easy in expression.
- Significant – economically, socially or aesthetically to the needs, interests and values of the audience

- Appropriate to the selected channel.
- Appealing, applicable, complete, manageable and attractive to the audience – having utility, immediate use.

3.2.3 Channels of Communication

Communication channel has significant contribution towards communication fidelity if it possesses the following characteristics:

- The value of communication medium, for example a particular channel, should not be of such a high cost that it is difficult to afford.
- Availability of the channel to the communicator i.e., it must be easily available.
- From the communication channel, maximum senses (hearing, taste, touch, sight and smell) of the person, may be utilized.
- Suitability of the channel for the audience and the message.
- Considering the main object of the message, communication channel should be selected.

3.2.4. Treatment of Messages

Treatment of messages can be varied, in almost an infinite number of ways.

The following are the categories of basis, useful for varying treatment.

- Repetition or frequency of mention of ideas and concepts.
- Contrast of ideas.
- Chronological- compared to logical, compared to psychological.
- Presenting one side compared to two sides of an issue.
- Emotional compared to logical appeals.
- Starting with strong arguments compared to saving them until the end of the presentation.
- Inductive compared to deductive.
- Proceeding from general to specific and vice versa.

- Explicitly drawing conclusions compared to leaving conclusions implicit for the audience to draw.

3.2.5. Audience

An audience is the intended receiver of messages. In a good communication, the audience to be aimed at is already identified by the communicator. The 'pay off' in communication is dependent on what the audience does in response to messages. An audience may consist of one person or many. It may comprise men, women or both; youth groups, villagers or their leaders. An audience may be formed according to occupation groups as farmers, fruit farmers, fish farmers or artisans; professional groups, as engineers, educators, administrators 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. The importance of clearly identifying an audience cannot be over stressed. The more homogeneous an audience, the greater the chances of successful communication. Likewise, the more a communicator knows about his audience and can pinpoint its characteristics, the more likely he is to make an impact. An audience is found by identifying categories such as those previously mentioned.

3.2.6 Evaluation

The following should be considered for effective evaluation -

- Evaluation is an ongoing, systematic process. It should be included in all communication planning to evaluate activities, plans and strategies. It should not be an optional activity.
- It helps an organization learn how to improve future performance. It reduces uncertainties, improves effectiveness and enhances decision-making.
- Evaluation is a management process that can be done informally or formally to help determine movement forward.
- Evaluation should be planned for at the beginning of the communication with development of measurable objectives.

3.2.7 Noise and fidelity

Noise and fidelity are two sides of the same coin. Eliminating noise increases fidelity and the production of noise reduces fidelity. The basic concern related to noise and fidelity is the isolation of those factors within each of the ingredients of communication which determine effectiveness of communication. High fidelity communication generally occurs when people know each other completely or at least well enough to trust their intent.

3.3 COMMUNICATION CREDIBILITY

Credibility means trustworthiness and competence. Credibility is defined as the objective and subjective components of the believability of a source or a message. Credibility can be treated as an interpretation of a receiver's perception of the source i.e. a set of perceptions held by a receiver. The characteristics that make a source credible varies as they are based on the perceptions held by a receiver. Before an audience accepts any message he/she will judge whether the communicator can be relied upon and is competent enough to give the information.

3.3.1 Credibility factors

- Competence or expertise or qualification or authoritativeness.
- Safety or trustworthiness.
- Dynamism.
- Smooth interpersonal relationships.

Credibility has two key components: Trustworthiness and expertise, both of which have objective and subjective components. Trustworthiness is based more on subjective factors, but can include objective measurements such as established reliability. Expertise can be similarly subjectively perceived, but also includes relatively objective characteristics of the source or message (e.g., credentials, certification or information quality). Secondary components of credibility include source dynamism (charisma) and physical attractiveness.

3.3.2 Types of credibility

Initial or extrinsic credibility: It is the credibility which communication is seen to have, before actual communication begins.

Derived credibility: It is the credibility which a listener perceives based on what takes place during inter personal encounter.

Terminal credibility: It is the credibility which a communicator is seen to possess after inter personal interaction is completed. It is a product of the interaction between initial and derived credibility.

3.3.3 Credibility of communication source

There are a number of sources now a days, for those who needs the latest technical knowledge. However, all the sources do not have the same credibility nor does all sources possess equal importance. It is mostly the relative effectiveness of an information source as perceived by the clientele that determines communication source credibility. Communication source credibility is finding out the degree of trust worthiness and expertness with which a source has been viewed by a receiver. Several researches have concluded that:

- High trustworthy and/or expert sources can produce a more positive attitude towards their position advocated than those which are considered less trustworthy and/or inexpert.
- Highly credible sources often create more behavioral compliance than do sources having less credibility.
- The source's expertise and trustworthiness do not affect immediate recall of the message.
- A high credibility source is more influential than a low credibility source if the source identification is made before presentation of message.
- High credibility source creates more persuasion.

3.4 COMMUNICATION COMPETENCE

In spite of all the progress made in understanding the process of communication, there is a lack of consensus regarding the concept of competence in communication. Hymes (1972) and Spitzberg and Cupach (1984) have recently made efforts to take stock of the various views expressed in literature about defining, understanding and measuring competence. They have identified at least six distinguishable categories for classifying competence.

- Fundamental competence, social competence and interpersonal competence are all concerned with achievement of outcomes.
- Linguistic competence and communication competence are message- focused rather than outcome-focused and attempts to explain message behaviour.
- Relationship competence examines relationship between behaviour and outcomes such as perception of appropriateness and effectiveness or social skillfulness.

Communication competence in an inter personal situation has been referred to as the ability to engage in appropriate and effective communication, the ability to convey accuracy in meaning, purpose, strategic message formation, ability to adapt messages appropriately to the interaction context etc. Communication competence is an individual ability and hence extends beyond knowledge of language. It includes the ability to process information cognitively and the ability to explain and predict human behaviour. In other words, it is the ability to perform as well as the knowledge of how to perform.

3.4.1 Components of Communication Competence

Communication competence has five major components for each individual, namely motivation, knowledge, skills, context and outcomes. This is based on the assumptions that:

- Competence is perceived appropriateness and effectiveness.
- Competence is contextual.

- Competence is a matter of degree.
- Competence is both molar and molecular (molecular behaviour provides specific communicative indicators of competence as well as a reference point for skill enhancement, while molar impression provides evaluative outcome criteria).
- Competent communication is functional (related to and productive of functional outcomes).
- Competence is an inter-dependent process.
- Competence is an interpersonal impression (it implies not actual performance but an evaluation of the performance by someone).

3.5 COMMUNICATION EFFECTIVENESS

Human beings not only communicates, but also thinks about communication. Whenever we think about communication process, our major concern is to increase its effectiveness. In order to increase effectiveness, we need to understand what it is and then be able to manipulate various factors in order to achieve it. According to the dictionary meaning, effective means producing a desired and efficient result. Accordingly, we may say that, communication effectiveness means a communication encounter that has produced desired results. Communication effectiveness has been operationalized into two broad approaches through several available literature reviews:

- Effectiveness of communication encounter
- Effectiveness of communication performance

For achieving proper comprehension, it is necessary that a receiver receives the communicated symbols along with their meaning and the desired context by the originator of the message. If effectiveness of communication encounter is to be viewed in terms of comprehension, then the question may arise about the extent to which the communicator was conscious and clear of the intended message, and the extent to which he/she happens to be successful in achieving the purpose. Thayer (1968) also says in this

regard that the originator's interpretation of the message is not necessarily accurate than the receiver's. The originator may or may not have clarity in mind what he intends to accomplish. Since communication is a dyadic process, effectiveness in terms of comprehension can also be thought in terms of both the communicator's and the receiver's point of view collectively. It is also assumed that there are different qualities of messages which are also likely to affect extent to which a communication encounter may be successful. Similarly, situational factors over which a communicator or a receiver has no control are likely to interfere in, what is likely to be accomplished in a communication encounter.

3.6 EMPATHY

Empathy is a way of understanding others. It is the ability to see things others do, their feelings, their thinking, their understanding and their point of view with the same emotions. Empathy is the ability to participate in the experience of another person to understand the other person's internal frame of mind and reference and accept the same to project oneself into the role of another person. When we say 'put yourself in my shoes' or 'look at it from my point of view', we are asking a person to empathize with us. According to some psychologists, empathy is the quality of being able to enter into the field of (i) social imagination, (ii) feelings, (iii) problems of another, (iv) expectation of things in succeeding situations.

3.6.1 Types of Empathy

Empathy can be divided into two major components: -

1) **Affective empathy:** The capacity to respond with an appropriate emotion to another's mental states. Affective empathy can be sub divided into the following scales:
   a) ***Empathic concern:*** sympathy and compassion for others in response to their sufferings.
   b) ***Personal distress:*** a self-centered feeling of discomfort and anxiety in response to another's suffering.

2) **Cognitive empathy:** The capacity to understand another's perspective or mental state. Cognitive empathy can be sub divided into the following scales:
   a) ***Perspective taking:*** the tendency to spontaneously adopt others' psychological perspectives.
   b) ***Fantasy:*** the tendency to identify with fictional characters.

Empathy is employed as a communication skill in order to sense emotions of the audience and to facilitate mutual understanding. A lack of empathy involves poor sense of communication that fails to understand the perspective of the audience. A shared feeling produces a sense of harmony which is effortless. An unshared feeling produces a gap that must be crossed by empathy. Empathizing is a process of reasoning by analogy, of explaining someone to yourself by finding a parallel in your own feeling response. The concept of empathy can be utilized for the judgment of character too. Persons who accurately perceive themselves as well as superiors and other people have better ability to judge the personality traits of themselves and of others. This suggests that they may have been more empathic. Empathy is considered a motivating factor for unselfish behaviour whereas a lack of empathy is related to anti-social behavior. Proper empathic engagement helps an individual understand and anticipate the behaviour of another.

3.7 FEEDBACK

The importance of feedback cannot be over emphasized and needs no special elucidation. "The term 'feedback' is taken from cybernetics, a branch of engineering concerned with self-regulating system. Feedback is the yardstick which measures effectiveness of communication and is used for evaluation review and to amend the message in light of the response. Efficient workers have reliable feedback and they succeed in effective communication. A transmitted message is said to be effective only when there is a provision for feedback in communication. In the communication process, feedback refers to a response from a receiver which gives the communicator an idea of how the message is being received and whether it needs to be modified. On the other

hand a communicator must know how well the message has been received by the receiver, understood, interpreted and acted upon.

Feedback helps to determine this process. Sending back knowledge about the message to the communicator is known as feedback. Thus, feedback is one of the important elements of the communication process. Two-way communication is essential in good feedback between a sender and a receiver which promotes good relations between them and motivates them to do their best. Hence, feedback is also referred to as "Action-reaction inter-dependence".

Feedback may be positive or negative. Positive feedback is the kind of feedback which is more or less acceptable or satisfactory to the sender. It means that the recipient of the message has responded in the way intended by the sender and taken the intended course of action. It signifies that everything is on the right track and no corrective measure regarding communication is necessary. On the other hand, if a recipient did not understand what the sender wish to convey, feedback is negative and necessitates further communication to wipe out the misunderstandings. Thus, negative feedback suggests that the communication was not effective and some correction, modification or re-assessment is required in the process. Negative feedback does not imply 'bad,' and positive feedback 'good.' Negative feedback indicates that you should do less of what you are doing or change to something else. Positive feedback encourages you to increase what you are doing.

3.7.1 Characteristics of feedback

i. Feedback is source oriented.
ii. Feedback varies in different communication situations.
iii. Feedback affects the source or communicator.
iv. Feedback exerts control over future messages.
v. Feedback affects communication fidelity and
vi. Feedback maintains the stability and equilibrium of a communication system.

3.7.2 Importance of Feedback

The importance of feedback in communication, either in a formal or informal setting, is due to the following:

1. It completes the whole process of communication and makes it continuous.
2. It sustains communication process.
3. It makes a communicator know if he/she is really communicating or making sense.
4. It is a basis for measuring effectiveness of a communication.
5. It is a good basis for planning on what next is to be done, especially statistical report.
6. Communication will be useless without feedback.
7. Feedback paves the way for new idea generation.

Feedback should be a continuous process, as audience and communicators are neither always the same persons, nor are they interacting in the same situation. Effective feedback needs to be clear, well-timed, specific, bearing the right attitude, truly representative, impersonal and informative. An extension agent shall take steps to analyze the responses of the audience, which may be positive, negative or there may be no response. If there is no response or negative response to a message, the extension agent should 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.

3.8 CONCLUSION

Fidelity of communication refers to the faithful performance of all the elements of the communication process viz., communicator, message, channel, treatment of the message and the receiver. Eliminating noise increases fidelity. This unit focused on how to ensure maximum fidelity in communication, credibility, competence, effectiveness, empathy and feedback. Communication must be credible and effective. Empathy is an important communication skill to sense the emotions of the audience and to facilitate mutual understanding. Feedback is another important aspect as it measures effectiveness of communication and helps to amend message in light of the response.

3.9 LET'S SUM UP

In this unit we have discussed fidelity of communication, communication competence and empathy, communication effectiveness and credibility and feedback. Communication is a fundamental and ever continuing process and is vital for survival in formal as well as informal settings. Communication process starts with a sender/source; who has a message for a receiver. It is a two way process. It has many varieties and forms. Communication is used for sharing information, giving or receiving instructions, getting the people influenced and integrating ideas and society. In the process of communication, there are several elements namely-communicator, objective, audience, and message, and channel, treatment of message, feedback / audience response, evaluation and noise. For communication to be effective, one shall ensure faithful performance of all these elements except noise, so that maximum fidelity can be achieved.

3.10 CHECK YOUR PROGRESS

1. List some distinguishable categories for classifying competence.
2. List down the major components of communication competence.
3. List some of the credibility factors:
4. List down characteristics of feedback:
5. List some of the importance of feedback.

6. Write true or false against each statement.

i) Eliminating noise increases fidelity and the production of noise reduces fidelity. T/F

ii) Communicator is the consumer of messages. T/F

iii) The more homogeneous an audience, the greater the chances of successful communication. T/F

iv) Fidelity refers to the faithful performance of the communication process by all its elements. T/F

v) For effective communication, audience must have enough knowledge of the subject. T/F

vi) Communication is not a dyadic process T/F

vii) Effective means producing a desired and efficient result. T/F

7. Match column A, and column B.

	Column A		Column B
a)	Terminal credibility	i	Credibility which a listener perceives based on what takes place during inter personal encounter.
b)	Derived credibility	ii	Credibility which communication is seen to have, before the actual communication begins.
c)	Extrinsic credibility	iii	credibility which a communicator is seen to possess after inter personal interaction is completed

Answer. a……..b……..……..c…….

8. Match column A, and column B.

	Column A		Column B
a	Affective empathy	i	Capacity to understand another's perspective or mental state.
b	Cognitive empathy	ii	Sympathy and compassion for others in response to their suffering.
c	Empathic concern	iii	A self-centered feeling of discomfort and anxiety in response to another's sufferings.
d	Personal distress	iv	Capacity to respond with an appropriate emotion to another's mental states.

Answer. a……..…..b……..…..…..c…….……d……...…..….

9. Fill up the blanks

i)……is the tendency to identify with fictional characters.

ii) ……. is a way of understanding others.

iii)…… is the tendency to spontaneously adopt others' psychological perspectives.

3.11 FURTHER READINGS/ REFERENCES

1. Berlo OK. 1960. The process of Communication: An Introduction to Theory and Practice. Holt, Rinehart & Winston.
2. Dahama OP & Bhatnagar OP 1987. Education and Communication for Development. Oxford &IBH
3. Mathur KB. 1994. Communication for Development and Social Change. Allied Publication.
4. Ray G.L. 1991. Extension, Communication and Management. Naya Prakash.
5. Sandhu AS 1993. Text Book on Agricultural Communication Process and Methods. Oxford Printing Press.

UNIT-4

KEY COMMUNICATORS – MEANING, IDENTIFICATION AND THEIR ROLE IN AGRICULTURAL DEVELOPMENT PROCESS

Highlights of the Unit

- Objectives
- Introduction
- Characteristics of key communicators
- Role of key communicators
- Identification methods of key communicators

- Conclusion
- Let's Sum up
- Check Your Progress
- Further Readings

4.0 OBJECTIVES

- To develop conceptual understanding of a key communicator
- To orient the learners about importance of key communicators in agriculture development process

4.1 INTRODUCTION

Key communicators or opinion leaders in any social system are persons who are sought for information and advice on general or specific topics. Rogers and Kincaid (1981) defined opinion leadership as the degree to which an individual is able to informally influence other's knowledge, attitude, or overt behavior in a desired way with relative frequency. It is assumed that such persons are respected persons in every social system, to whom some people look for advice and information and who through such consultations, influence their behavior and action.

The concept of key communicators was first developed by Katz & Lazarfield et al (1944). Since then they have been variously called as fashion leaders, influencers, information leaders, opinion leaders, spark plugs, style-setters, gate keepers etc. However, all these names have been used more or less for individuals operating in a social system who are more important in the communication of information than others.

4.2 CHARACTERISTICS OF KEY COMMUNICATORS

Key-communicators have been found to have distinctive characteristics. On the basis of review of a large number of research studies, Rogers and Shoemarker (1971) drew the following conclusions regarding characteristics of key-informants.

4.2.1 **External communication**

- Key-communicators have greater exposure to mass media than their followers
- Key-communicators are more cosmopolitan than their followers.
- Key-communicators have more change agent contact than their followers

4.2.2 **Accessibility:**

- Key communicators exercise relatively greater social participation than their followers in a social system

4.2.3 **Social status**:

- Key communicators enjoy relatively higher social status than their followers, as far as conditions in that social system exists.

4.2.4 **Innovativeness**

- Key-communicators are more innovative than their followers
- When a social system's norms favor change, key-communicators are more innovative but otherwise not especially so.
- When the norms of a system are more modern, key-communicators are more monographic – i.e. tendency of a key-communicator to act as such only for one topic.

4.2.5 **Relationship to the social systems:**

- Perceived as the best farmers when a social system is actively modern.
- Social stars when a social system is relatively traditional.

4.3 ROLE OF KEY COMMUNICATORS

1. Diffusion of new technology to other villages.
2. Keeping in touch with scientists, other institutions, media and sources of information.
3. Coordinating functions of the village organizations and the institutions; and

channelizing them towards adoption of technologies for greater production.

4. Assisting villagers in securing supplies and services required by them.
5. Guiding and helping people in getting assistance from government.
6. Helping fellow villagers in preparation of action plans.
7. Giving constant guidance and acting as local consultants.
8. Focusing on the problems of villagers and helping extension workers.
9. Serving as a demonstrator in case of agricultural innovation.

4.4 IDENTIFICATION METHODS OF KEY INFORMANTS

Three important methods are commonly used for identifying key-informants. These methods are:

4.4.1. Socio-metric method

This method is very useful to the Extension Workers in finding out the natural or local or informal leaders in villages, who are influential in introduction and popularization of new, improved practices in their communities or neighborhoods. An extension worker goes to a given area and asks farmers to indicate whom they ordinarily consult for advice on farming (or any particular aspect of farming in which the extension worker wants to introduce some improvement). Usually after few interviews, it becomes apparent which farmer is an influential person or natural leader.

The Figure (sociogram) illustrates this.

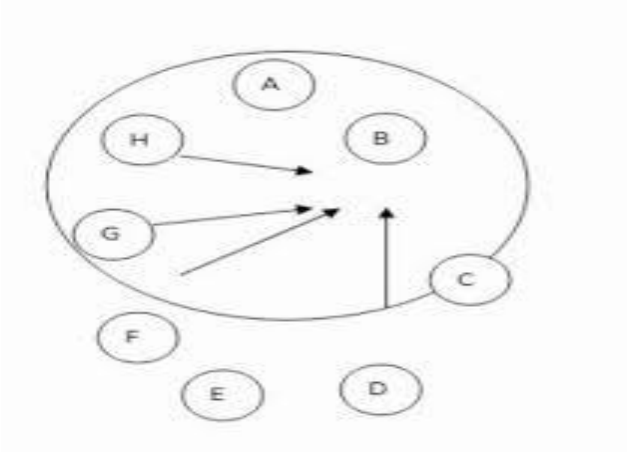


Fig 4.1 Sociogram

When 'H' is interviewed he may indicate that he generally goes to 'B' for advice on farming. 'G', 'F' and 'D' may also say that 'B' is the one whose advice they take on farming. Then 'B' is the operational or potential 'natural' leader for these people and therefore if an extension worker succeeds in inducing 'B' to take up a new practice, it is quite likely that others will be influenced by his behavior. 'B' may or may not hold an office or leadership position in organizations in this area. He may even not think himself as a leader and may insist that he is not a leader. However, so far as these farmers are concerned, 'B' is the operational leader in relation to farming practices.

4.4.2 Information ratings:

In this method, some members of a social system are purposively or randomly selected and asked to designate persons giving advice and information on a general or particular topic. This method is economical and quick as it saves cost and time. However, it is limited to the extent each informant is thoroughly familiar with the social system. This method is usually used in emergency where the extension worker is new to the social system and wants to send an urgent message or distribute some subsidy.

4.4.2.1 Self-designating method:

In this method, each of the selected persons are asked a series of questions

designed to determine the degree to which they perceive themselves to be key-communicators. This method has an important advantage, in so far as it also measures an individual's perception of his/her being a key-communicator, which in turn influences his/her behavior. However, its accuracy is limited to the extent respondents can identity and report their self-image correctly.

4.5 CONCLUSION

Key communicators or opinion leaders are persons to whom people look for advice and information. They exercise greater social participation and are more innovative. They have a key role in diffusion of new technology to other villages, keeps in touch with scientists, other institutions and information sources. They help people to get assistance from government, guiding fellow villagers in preparation of action plans, etc. Different methods can be used to identify key communicators.

4.6 LET'S SUM UP

Key communicators or opinion leaders are respected persons in a social system who are sought out for information and advice. They are also able to informally influence knowledge, attitude, and behavior of others in a desired way.

4.7 CHECK YOUR PROGRESS

1. What is the role of key communicators in development process?
2. List few characteristics of key communicators.

4.8 FURTHER READINGS

Rogers, Everett M. and D. Lawrence Kincaid (1981), Communication Networks: Toward a New Paradigm for Research, New York: The Free Press.

Rogers, E. & Shoemaker, F. (1971). Communication of Innovations: A Cross-Cultural Approach.

BLOCK II: FORMS OF COMMUNICATION

UNIT-1

FORMS OF COMMUNICATION AND COMMUNICATION SKILLS

Highlights of the Unit

- Objectives
- Introduction
- Forms of Communication
- Communication skills for extension personnel
- Inter-personal Communication Skills
- Conclusion
- Let us Sum up
- Check Your Progress
- Further Readings

1.0 OBJECTIVES

- To make the learners understand different forms of communication
- To develop effective communication skills among the learners.

1.1 INTRODUCTION

Communication takes many forms and may vary according to participants, situation, channels used and the context. Based on communication channels, communication may be verbal or non-verbal. It may be through written or oral communication**.** The experts tell us that only 35 per cent of what we communicate is in the verbal message. The remaining 65 per cent of the meaning is contained in the non-verbal communication. Non-verbal communication includes facial expressions, eye movement and other body movements or use of symbols which must be considered when interpreting meaning. In any social interaction with other people, one must be aware of the non-verbal cues and signals. In addition to the verbal aspects, psychologists have been paying increasing attention to these non-verbal aspects of

communication. Communication based on style and purpose may be formal or informal. Communication may be one-way or two-way interaction. Communication may also be classified as intra-personal communication, inter-personal communication, group communication and mass communication.

1.2 FORMS OF COMMUNICATION

1.2.1 Verbal Communication

Communication through use of language is verbal communication. Verbal communication may take place directly between superiors and juniors in organizations, between officers in different organizations etc. This may either be oral or through written communication.

1.2.1.1 Oral Communication:

Oral communication is the interchange of messages through spoken words between a sender and a receiver. It may be in the form of face-to-face communication, talks, a public address, verbal discussions, telephonic talks, telecommunications, speeches, lectures, training sessions, etc.

This kind of communication has certain merits-

i. Less time consuming, is more direct, simple and the least expensive.

ii. It is more communicative, effective and helps in avoiding delays, formalities.

iii. It provides an immediate feedback, as questions can be raised and answers obtained about the transmitted information.

iv. Since every information cannot be put into writing, most of it is conveyed by means of oral instructions, mutual discussions and telephonic conversations.

However, it has certain demerits also as:

- Lengthy and important information cannot be effectively conveyed orally.
- There may be some distortion if there is some cause of indifference between the

receiver and the sender.

- It is inadequate where permanency and uniformity of form are required.
- Communication may be incomplete due to various communication gaps, as a result of status and other physical or personal barriers.
- Spontaneous responses may not be carefully thought.
- The spoken words can be more easily misunderstood than the written words.
- It presupposes expertise in the art of effective speaking.

1.2.1.2 Written communication

This is communication through written words. A written communication is always put into writing and generally used when the audience is at a distance or when permanency or a record is required or where its preservation is essential, in case it is needed as evidence in cases of dispute. It is generally in the form of instructions, orders, rules and regulations, policies, procedures, posters, memos, reports, information bulletins etc.

The merits of written communication are:

- It serves as an evidence of what has occurred or what was stated.
- It provides a permanent record for future use.
- It reduces chances for misinterpretation and distortion of information.
- It is reliable when transmitting lengthy information on finance, production or other important data.
- It provides an opportunity to subordinates to put their grievances in writing and get them supported by facts.

However, written communication also suffers from certain disadvantages-

- It is generally an expensive and a time-consuming process.

- Even though such communication has been transmitted, it is not certain whether the receiver has understood it.
- Written materials not only get out of date but may also be leaked out before time.
- It sometimes leads to excessive formality in personal relations.

1.2.2 Non-verbal Communication

A message can be sometimes expressed without the help of words. Non-verbal communication is the process of communicating without the use of words. This is also known as body language. Non-verbal communication involves use of gestures, vocal characteristics, facial expressions, and spatial relationship between a sender and the receiver to convey a message. For example, a smile, a glance, stare or a frown convey different purposeful meanings.

Components of Non-verbal Communication

The components of non -verbal Communication include:

Kinesics- It is the interpretation of body language such as facial expressions and gestures or more formally, non-verbal behavior related to movement, either of any part of the body or the body as a whole. Body language is technically known as kinesics. Body language is the unconscious and conscious transmission and interpretation of feelings, attitudes and moods through body posture, movement, facial expression and eye movement; and this transmission and interpretation can be quite different from the spoken words. Body movements include gestures, facial expressions and other physical movements. Each body part's movement conveys certain meanings. For example, raising an eyebrow conveys disbelief, shrugging shoulders shows indifference. When a person is eager to hear something, he sits with his feet under the chair, toes pressed to the ground and leans forward on the desk. When a person is listening carefully, he maintains eye contact and frequently nods his head. Body language coupled with verbal communication gives more meaning to a message.

Proxemics is the technical term for the personal space aspect of body language. Proxemics is the study of measurable distance between people as they interact. Proxemics explain how people perceive and use space to achieve communication goals. Body spacing and posture are unintentional reactions to sensory fluctuations or shifts, such as subtle changes in the sound and pitch of a person's voice. Edward Hall outlined the following ideas behind proxemics theory:

1. There are four types of distances people keep: intimate (0 to 18 inches), personal (18 inches to 4 feet), social (4 to 10 feet) and public (over 10 feet).
2. The distances outlined are those deliberately chosen by individuals.
3. Proxemics behaviour is learned mostly from observing others, which is why personal distance and physical contact varies by culture.
4. The physical distance between communicators indicates the type of relationship they have. Body angles, touch and eye contact further reveal familiarity between people.

Oculesics: It is the study of the role of eye contact in non-verbal communication. Our eyes are a very significant aspect of the non-verbal signals we send to others.

Haptics: refers to the study of touching. There are six different kinds of touch. These include: positive, playful, control, ritualistic, task-related and unintentional. Managers should know the effectiveness of using touch while communicating to subordinates, but need to be cautious and understand how touch can be misunderstood.

Para linguistics: It is the study of variations in pitch, speed, volume and pauses to convey meaning. When a speaker is making a presentation and is looking for a response, he/she will pause. However, when no response is desired, a speaker will talk faster with minimal pause.

Paralanguage: refers to the non-verbal elements of communication used to modify meaning and convey emotion. Paralanguage refers to voice quality, volume, pitch, speed and non-fluencies (like 'ah,' 'um,' or 'uh.') used to convey a message. It helps to convey

information about the attitude of a speaker.

Physical Appearance: Physical appearance always contributes towards how people perceive individuals. Neatly combed hair, ironed clothes and a lively smile will always carry more weightage than words.

1.2.3 Formal Communication

Formal communication occurs in a formal setting as in an organization. This happens during conferences, meetings, corporate letters etc. Formal communication in an organization may be downward, upward, diagonal, horizontal or external.

Downward communication is from the highest authority in an organization to the junior staff. eg. From a Director to Assistant Directors. The purpose may be to give instruction to employees regarding their jobs and specific tasks; provide information about organizational procedures and practices to new employees; to provide subordinates feedback about their job performance or to give information required by different teams and departments for the achievement of goals.

Upward communication is from junior officers to senior officers. This may be submission of the progress on a project, grievance redressal, proposals etc.

Horizontal communication takes place between departments and employees who are at the same level in the organizational hierarchy. For eg. Meeting of Heads of Departments.

Diagonal. In this type of communications, there is no direct path chalked out for information to travel. It could, at certain stage, take on the upward path, then a lateral direction and finally, move downward, or it could even skip certain stages. This channel proves to be very effective as hierarchical bindings are done away and communication flows irrespective of position or status. It also helps in building relationships and binding ties between superior and subordinate. This may also be from a senior officer from one department to the junior officer of another department who may be members of the same working group or project.

External Communication*:* An organization may communicate externally with other organizations, with outside groups, such as suppliers, clients, government agencies and community groups.

1.2.4 Informal Communication

This is free and unrestrained communication between people. There are no rigid rules and guidelines. Informal communication is also known as "Grapevine". They are free from all sorts of formalities, because they are based on the informal relationship between the parties.

Communication can also be classified under intra-personal, inter-personal, group and mass communication.

1.2.5 Intra-personal Communication

Intra-personal communication is communication with oneself using reflective thinking.

1.2.6 Inter-personal Communication

Inter-personal communication is communication between two or more individuals. We spend more time engaged in inter-personal communication than other forms of communication. Inter-personal communication occurs in various contexts. Inter-personal communication is more goal oriented than intra-personal communication.

1.2.7 Group Communication

Group communication is communication among three or more people who are interacting to achieve a shared goal. The study of group communication is valuable in many contexts. A Farmers' Commodity Interest Group (CIG) is a self-managed, independent group of farmers with a shared goal and interest. The members work together to achieve this goal by pooling their existing resources, gaining better access to other resources and to share the resulting benefits.

1.2.8 Mass Communication

Communication becomes mass communication when it is transmitted to many people through print or electronic media. Print media such as newspapers and magazines continue to be an important channel for mass communication along with television, websites, blogs and social media. Radio is another example of mass media. The technology required to send mass messages distinguishes it from other forms of communication.

1.3 COMMUNICATION SKILLS FOR EXTENSION PERSONNEL

Good communication is an important aspect of inter-personal relationships. Communication skills are as important as technical skills, if one wants to become an effective leader. Listening is one part of communication which sounds fine in theory but is rare to find in practice. Empathy will help one to understand people and respond to their needs more effectively. Experts report that, as much as 65 per cent of the message communicated is non-verbal or through body language. Extension personnel need verbal, non-verbal and inter-personal skills including skills in writing, listening, reading and speaking for effective communication.

1.3.1 Writing Skills

Any written document is a verbal structure consisting of words, sentences, phrases, clauses which form paragraphs and text. To get an effective writing style requires rigorous practice.

A good writing is one that is clear at first reading and demands no further explanation. For most of the professionals, writing is not something that comes easily. Written communication has its own place in organizational communication. Effective writing is a skill which can be learnt.

A systematic approach for effective writing:

Any writing should involve the following stages:

- Preparation & planning

- Writing
- Checking

Preparation & planning

Ask yourself why are you writing? What is the Objective? For whom are you writing i.e. the Audience?

The best way to prepare for writing is to answer a series of questions – 5Ws and 1 H. They are why, who, what, where, when and how. This helps to clarify certain issues before writing. It is always helpful to follow pattern plans. Pattern plans or mind maps are increasingly popular for organization for information. It allows us to access information through associates as well as logical connections. Following are steps to develop a mind map.

1. Take a plain sheet of paper and draw a circle in the middle.
2. Write down the subject (title) in the circle.
3. Write down any idea connected with the subject.
4. Highlight the key ideas using different colors.
5. Group information around these key ideas using branches and twigs. Add and edit items.
6. Continue the process until the pattern plan is complete. Now list key ideas as headings in a logical sequence.

The advantages of pattern plans are:

Rapidity: More ideas in shortest time.

Completeness: We can get the whole picture of the subject at a glance.

Efficiency: Gather and structure material simultaneously.

Individuality: It is our record of thinking. If it makes sense to us, it is much likely to make sense to the readers.

Writing: Produce the first draft fast, write as you speak. Put words on to the page.

Checking: Follow a 10 point plan

1. **Paragraphs**: A page should not have less than two paragraph breaks. Use short paragraphs, isolate action points. Use sub-headings and be consistent in layout. Open each paragraph with a topic sentence. Use link words and phrases to guide a reader from one paragraph to another.
2. **Sentences:** Short sentences are easier to read than long ones. Average length is 17 words per sentence; 25 and above is difficult to understand.
3. **Subject and verb:** Each sentence should have a subject and a verb. Verb must be finite having tense.
4. **Ideas:** Put important ideas at the beginning or end of sentence as attention will be more. Ideas buried in the middle will risk being lost. Break long sentences to chunks of 5-10 words**.**
5. **Passive-active verbs:** Beware of writing impersonally. Use of passive voice lacks personal touch and is not readable. Always use active voice.

Example: *Active:* She organized the program.

Passive: The program was organized by her.

1. **Adjectives and adverbs:** Use adjectives and adverbs which are absolutely necessary.
2. **Accuracy:** Use the right words for the right expression or action. Use jargon in its right place.
3. **Brevity:** Use short words; eliminate cliches e.g. 'As a matter of fact', 'as such', 'by and large' etc. Watch out for tautology – saying the same thing twice e.g. 'True facts are'; 'enclosed herewith'; 'declined to accept'.
4. **Clarity:** The content must leave no room for ambiguity. Avoid vague phrases, loaded words; replace abstract nouns with concrete nouns.

5. **Spelling and punctuations:** Spelling matters as it contributes to our professional and public image. Do not use words unfamiliar to you, always use simple, short words, use dictionary for correct usage of words. Beware of the spell checker. Use thesaurus to improve vocabulary. Punctuation provides expression and voice to words. Use it wherever required.

To be an effective writer, a person should cultivate certain habits, attitudes and quality of mind. Some of them are:

a. Visualize what you wish to say. If you are clear about what to communicate, words would automatically follow to express it - clear thinking and clear writing go together.

b. Prepare the first draft.

c. Stop when you finished saying what you wanted to say. Remember a professional writes to express but not to impress.

d. Revise the draft carefully by editing.

e. Approach the problem with a scientist's objectivity, detachment and passion for both.

f. Don't elaborate a point unnecessarily, make it crisp and sharp.

Writing for Different Media

Various media are used to communicate news and information and can be categorized into:

Print Media: newspapers, magazines, newsletters, journals, reports, institutional publications and others;

Electronic Media: radio and television and *Online media:* Internet and World Wide Web. While basic principles are the same, each medium has its own style of news reporting as per their respective features. The audience is varied too.

Radio can transmit in the local language, addressing issues of importance to local listeners. However, radio newscast is sequential. The listeners cannot rewind the story or move to the next program. Radio reporting is for the listener so radio news stories must have familiar words along with a conversational style. More focus is on understanding by the audience than grammar, in a radio news report.

Television uses both audio and video and is similar to radio news reporting, with video added. It is important that the words and pictures match and that they don't give different messages. Like radio, a television viewer also has no control over the pace of reporting. They cannot go back to the story to see or listen to it again. As compared to print media, TV and radio require a more conversational tone. Various aspects of writing for electronic media have been covered in Block III unit 1.

Digital or online media: combines the features of print as well as broadcast media. An online news report can include audio clips from interviews, text of government records and interactive maps. Interactivity is one of the features of Online Media. User can give their feedback or opinions, which others can also read and respond to. Another feature of online media is 'multimedia' - use of audio, video, graphics, etc. Web content must be more brief than print. On the web, most users scan the page instead of reading word for word, focusing on headlines, summaries and captions. Instead of in-depth reading they prefer short paragraphs. Web users are less likely to read lengthy text. Radio is about telling the story, TV is about showing it, print is more about telling and explaining while online is about showing, telling, demonstrating, and interacting.

Whether we are writing for print media or scripting for radio or TV, having the audience in view is important. The content, presentation, format, style of writing, language should suit the audience we are writing for. We need to understand what the audience already know, what they need to know and the benefit for them. This will help slant the writing to the intended audience. There would be a different style for a report, news story and a farm journal.

Writing for online media. Online media combines the features of print and broadcast media with an additional unique feature of interactivity. Various forms of online media are used for disseminating agricultural information. These new media allow creation and exchange of user generated content and offer agricultural community new ways to collaborate and communicate, provide ways for professionals to stay updated with the latest information, highlight their work, exchange information and resources and network with like-minded professionals. Online media can reach a vast audience and offers lot of space for news writing. Unlike newspapers, news published online can be updated instantly.

Social Media platforms like Twitter, Facebook, and WhatsApp are encouraging interaction and sharing of information.

Some Tips

- Content needs to be packaged for a platform. Each platform has its own format and style.
- Simple statements are preferred along with conversational style.
- Posts may be kept short – statistics show that posts with less than 40 words get 60% more engagement.
- Posts need to be written in an informal style, without jargons to engage audience.
- Active voice may be used in writing.
- The most newsworthy information comes first, before the details and background information.
- Posts with visuals capture more attention.
- News about projects in the field, human interest stories get more attention.
- Asking interesting questions would encourage interaction.

- Web readers prefer brief content and short paragraphs. This is partly because reading from a computer monitor is 25% slower than reading from print documents.

1.3.2 Speaking Skills

Many people are terrified when they have to make a public speech. Given here are some guidelines for preparing and delivering a speech to help you become a confident speaker. As an extension worker, you would give a variety of oral presentations. Learning how to handle such situations with ease is a skill well worth developing. It will help you communicate more effectively in a wide variety of everyday situations.

1.3.2.1 Preparing a speech

There are six basic steps to follow in preparing a speech. They are (1) analyzing the audience (2) choosing a topic, (3) determining the purpose of the speech, (4) gathering information, (5) organizing the content and (6) choosing a format.

Analyzing the audience

To speak effectively before a group of people, you need to know something about them. How much knowledge about the topic does your audience already have?

Attitudes

If you are presenting a controversial topic, try to find out what attitude your audience already holds towards the topic. Are most of the members inclined to agree or disagree with the position you will present? Or are they indifferent? If they're indifferent or likely to disagree, you may have to gather more facts and present those more forcefully to be effective.

Size

A large group may require a more formal speech presentation than a small group. If the group is large, you may be speaking behind a podium or on a stage. If the group is small, you may simply be seated at a table with other members of the group. These factors may influence your choice of speech format and delivery techniques.

Choosing a topic

There are several points to consider in choosing a topic. Firstly, choose a topic that interests you or you already know something about that. You're more likely to enjoy preparing and delivering a speech on a topic you like, than the one you don't particularly care about. You're also more likely to get a good response from your audience. Secondly, consider probable interests of your audience. A speech on how to use social media may have an enthusiastic response from extension officers but would be of little interest to a group of college students. Thirdly, make sure that the topic and tone of your speech fit the occasion. Fourthly, if your topic requires research, then necessary information may be gathered. Finally make sure you can cover your topic adequately within the allowed time. Limit your topic such that you can present your main idea and support it with meaningful details.

Determining the purpose

Almost every speech has at least one of the three main purposes: (1) to inform, (2) to persuade, or (3) to entertain. An informative speech provides information and consists largely of facts presented in a straight forward manner. A persuasive speech tries to convince an audience to do something or to adopt a particular practice or technology. Persuasive speeches may rely on emotional appeals, as well as facts to achieve their purpose. An entertaining speech provides a pleasant experience for the audience and may have a more informal tone than the other two kinds of speeches.

Gathering information

If your speech requires information you don't already have, you'll need to do research. Here are three ways to go about it:

a. Observe the subject matter itself. You may need to visit the site or observe the process. (e.g. use of a new technology or a good practice)

b. Use library and online resources - books, magazines, newspapers, pamphlets, electronic databases, internet and other materials for information.

c. Interview an expert or others who have first-hand knowledge. If you're preparing a speech on the impact of a project, for example, you might interview the project head and other stakeholders.

Organizing the content

Like a written report, a good speech requires careful organization. Most speeches are organized in three parts:

a. The introduction,

b. The body and

c. The conclusion

As you develop the content of your speech, always keep in mind the importance of attracting your audience's interest in the beginning and holding it to the end. The introductory speech needs to tell the audience what your speech is about – but in a way that will want them to listen. Don't begin by saying. "This speech is about . . .", instead, try using a personal anecdote or lead in with a dramatic statement.

In the body of the speech, present your main points and supporting details. Make sure the details are closely related to your topic and interesting to your audience. You can present the main points in several ways, depending on your topic. You can arrange them in order of importance, putting the most important points first. You can use chronological order, describing events in the order in which they occurred. In some speeches, you might discuss a topic that is new to your audience or difficult to understand. In such cases, begin with the simplest facts and work your way up to the more difficult ones. Or think of something that your audience already know about, that could help them understand the new topic.

Content could be structured as follows:

a. Problem-Solution-Benefit Structure

b. Comparison/ Contrast Structure;

c. Cause-Effect Structure;

d. Chronological

e. Pro's/ Con's Structure

f. Topical

The conclusion of your speech is your final opportunity to impress the members of your audience. Try to leave them with something to think about.

Choosing a format

You need to decide what kind of format to use in delivering your speech. You have four choices" (1) reading the speech, (2) memorizing the speech, (3) speaking impromptu, and (4) speaking extemporaneously. In choosing a speech format, make sure that it is the one you are comfortable with, and one that suits the occasion. Each format has advantages and disadvantages.

Reading a speech may seem to be the safest format. You don't have to worry about forgetting anything, and you can make sure your speech precisely fits the allotted time. But reading your speech also has disadvantages. You may become so engrossed in your manuscript that you forget to look up at the audience. You may begin speaking in a monotone, causing your listeners to lose interest. Once they've lost interest, the point of your speech may never get across. Reading your speech also makes it difficult to adjust the content in response to audience reactions.

If you choose to read your speech, type it double-spaced or write it out neatly so that you can read it easily. Some people write their speech on large note cards and make an effort to look up at the audience at least at the end of each card.

Memorizing the speech requires that you first write it out and then memorize it word by word. Depending on the length of the speech, this type of delivery could mean days of extra preparation, time and effort. The format also has several other disadvantages. You might concentrate so hard on remembering the speech that your

voice sounds unnatural and you'll be unlikely to add remarks or otherwise adjust your speech to suit the mood of the audience. If you decide to memorize your speech, you'll have to keep in mind the need to make your delivery natural and relaxed.

Speaking impromptu requires little or no preparation. As a result, it is rarely used for a formal speech. An impromptu speech enables you to give a lively, spontaneous delivery which can be suited specifically to the mood of the audience. But an impromptu speech risks, being unorganized. Without adequate preparation, you may ramble and never get your point across effectively. If you know ahead of time that you'd like to say something at a meeting of other occasion, take at least a few minutes to organize your thoughts and jot down your main ideas.

Speaking extemporaneously is the most commonly used type of delivery in public speaking. You organize your ideas in a written outline and use it as a guide when you give your speech. An extemporaneous speech has the advantage of being both organized and spontaneous. Although you don't write down the complete speech, you can refer to the key words or sentences of the outline to keep yourself "on track." You can easily add or omit details on the basis of audience's reaction. And it's easy to maintain eye contact with your audience when you speak extemporaneously than when you read from a manuscript.

To take full advantage of the flexibility of the extemporaneous speech, learn about your topic in-depth. Gather more details than you'll actually need. That way, you'll have a full stock of material to draw upon, to keep your speech interesting. You can also vary the content, depending on the audience's reaction.

1.3.2.2 Rehearsing and Delivering a Speech

After you've completed all the steps in preparing your speech, you're ready to begin rehearing. Rehearsing is vital; the more you rehearse your speech, the more confident you'll be, when time comes to deliver it.

As you rehearse, remember that you want to convey more than the information.

You also want to convey enthusiasm for your topic. If you sound interested, your audience will be more likely to listen to and enjoy your speech.

How to rehearse

Begin rehearsing by using your outline or reading aloud from your manuscript. As you repeat the speech many times, you'll depend less and less on the written words. If possible, record your speech and listen to it critically. You may find that you're not pronouncing all the words clearly or that you're going too fast or too slow.

Next, practice in front of a mirror, paying attention to your posture and gestures. Then, ask someone to listen to your speech and give an honest reaction to both, the content and the delivery. Listeners may be able to spot distracting mannerisms that you should correct, such as clenching your fists at your sides or shuffling your feet. You can also video record, to observe your strengths and weaknesses. Finally, if you will be delivering the speech in an unfamiliar place, try to check out the place, if possible. That way, you will be familiar and comfortable with the setting.

Your voice:

The way you use your voice can greatly add to the impression you make when delivering a speech. As you speak, pay special attention to the volume, speed and pitch of your voice and clarity of pronunciation.

Volume is important, you should speak loud enough so that the audience can hear you clearly. You'll have to consider factors such as size of the room, whether you'll be using a microphone and whether there are outside noises you must speak over. Try to vary your volume to make your voice sound more interesting. At times, you might have to speak more loudly to emphasize an important point. At other times, you might gain attention by speaking more softly, making the audience listen more carefully.

Speed:

Don't speak so fast that your words become difficult to understand. If you have a time limit, pace yourself so that you can finish your speech without having to hurry at

the end. Varying your speed time to time can make your speech more effective. You can slow down to emphasize a point. A dramatic pause at the end of a particularly important statement can be an effective technique.

Pitch is how high or low your voice sounds. You vary your pitch automatically during normal conversation. Your voice sounds higher when you are excited and lower when you are serious. During a speech, your voice should follow this natural pattern of pitch variation. Try to avoid speaking in monotone.

Clarity of pronunciation:

Speak as distinctly as you can without sounding unnatural. Avoid saying "er" or "uh" between words or phrases. Enunciate word endings clearly.

Your appearance:

Your appearance is as important as your voice when you give a speech. Dress neatly in comfortable clothing that is appropriate to your audience. Avoid wearing unusual clothes or jewelry that might distract the audience or get in your way as you speak. Stand up straight but in a relaxed manner. Don't slouch or lean on the podium, if you are using one. Try to keep a pleasant expression on your face.

When you speak, keep an eye contact with your audience. Don't look up at the ceiling or down on the floor. If you're reading from a manuscript, hold it up slightly so that you can easily glance at the audience from time to time.

Gestures can help emphasize important parts of your speech. But don't overdo them. If you gesture constantly, you'll make the audience more aware of your gestures than your words. And make sure your gestures look natural and blend smoothly with what you're saying.

Audio – visual aids:

Audio visual aids can enliven your presentation. These include drawings, photographs, maps, charts, graphs, diagrams, chalkboards, models, slides, films and

videotapes. Audio-visual aids can add variety to your speech and facilitate in sustaining audience's attention. They can enable an audience to understand what you mean exactly. They can also make your speech memorable by leaving the audience with a more vivid impression of your topic than words alone can convey.

Rehearse with your audio-visual aids so you can incorporate them smoothly into your speech. Here's a list of points to remember when using audio-visual aids:

1. Have them set up and ready to use before your speech. If an aid is particularly interesting or unusual, it may be a good idea to have them handy, but hidden, until appropriate time in your speech. Other-wise, the audience may be too distracted to pay close attention to the earlier parts of your speech.
2. If you're going to write on a board or paper, remember to keep turning back to the listeners, to keep an eye contact with them.
3. Don't pass a visual aid around during your speech. It's too distracting. If you have material to pass out, do it before or after your speech.
4. Don't stand in front of a visual aid or block the view of the audience.
5. Remember to talk to the audience, not to the aid.

Stage fright:

When the time finally comes to deliver speech, you'll probably suffer from – stage fright. To keep your nervousness from working against you, concentrate on what the person speaking before you is saying, rather than worrying about your own presentation.

When your turn comes, take a deep breath or two to help stay calm. Act confident, even if you don't feel confident. Walk briskly to your place and look directly at the audience to gain attention of the group. Then begin. Once you begin speaking, your nervousness will lessen.

1.3.3 Listening Skills

Listening is a process of receiving, interpreting and reacting to the messages received

from a sender. Listening is a process involving awareness, reception and perception.

Misconceptions/Myths about Listening:

Listening is the same thing as hearing

Listening is not an automatic process. Listening is different from hearing. In hearing, the sound waves strike the eardrum causing vibrations. These are transmitted to the brain. Listening occurs only when a brain swings into action by reconstructing these electronic impulses, giving meaning to the sounds. True listening is a dynamic process. It involves more than the passive act of hearing. Hearing is with ears, but listening is with the mind.

All listeners receive the same message

If this were so, why do some people sleep or not enjoy a speech/presentation/lecture. All listeners do not receive the same message in uniform manner. Listening is a very demanding activity. It demands not only full attention but also proactive interest in what a speaker is talking about. This may not be always easy for all listeners.

Good readers are good listeners

Listening improves with age. Listening skills are difficult to learn. Researchers found that shortly after a 10-minute oral presentation, an average listener will have retained only 50% of what was said and after 48 hours they are likely to remember only 10%. If you want to be an effective listener, then you must not only open the lines of communication and relax but also compel others to do the same. You only hear with your ears (which are always open), but listen with your mind.

Effective Listening:

Most successful leaders and managers LISTEN. Many qualities can take you to the pinnacle of your profession, but what can "keep" you there is effective listening. "The better you listen, the luckier you get," says Kevin J. Murphy, a U.S. management

consultant. According to him, listening is an accurate perception of what is being communicated and an open mind is therefore the key to communication. We are blessed with two ears and one mouth – a constant reminder that we should listen twice as much as we talk.

The most common complaint is "He (or she) doesn't listen to me." Whether it is an officer to a subordinate or a subordinate to an officer, all have the same complaint. We seldom listen to half of what is said and we may not be fully attentive to the other half. Hearing is momentary, either you get the message and remember it, or it is gone forever.

Distortions in listening:

There is a game where one person whispers two or three sentences to the person standing next in a line; at the end, the message barely resembles the original thought. This apart from producing fun and enjoyment among participants is an effective learning lesson about distortion in listening. Not listening properly can result in a disaster. "We seem to have inadvertently overlooked listening as a facet of communication. It is the most important link but obviously the weakest one".

Listening is least taught:

Perhaps the least attention is paid to listening in classroom instructions. The primary attention has been on reading and writing. Very little emphasis is paid on speaking and almost no attention to listening skills. The only training on listening has been in the form of admonitions or commands: "Listen" or "Listen carefully." We need to focus on effective listening.

Types of Listening

1. **Ignoring:** Completely not listening to others.
2. **Pretending:** Yeah! Right, uh-huh are some of the expressions of those who practice pretending.
3. **Fake Listening**: Many listeners mistake silence for listening. They steadfastly fix

their eyes on the speaker and try to project themselves as good listeners. In fact they miss many important points.

4. **Marginal Listening**: A poor listener is a marginal listener. Day dreamers, poor listening habits, wandering attention and avoiding understanding of complex points by finding escape routes are the characteristics of marginal listeners**.**
5. **Evaluate Listening**: This traps a listener into the temptation of passing hasty judgments or unfounded evaluations about the speaker.
6. **Selective Listening**: Hearing only certain part of the speech/conversation etc. that they think is important to them.
7. **Attentive Listening**: Paying attention and focusing energy on the words that are being said. It is a process to observe and understand what is said and to assimilate the viewpoint of a speaker.
8. **Empathic Listening or Active Listening**: This is the highest form of listening. This is listening with intent to understand how they feel. This type of listener practices a lot of mental paraphrasing.

Developing listening skill is very important for various reasons. Here are some of the many benefits you get by becoming a good listener:

Benefits of being a good listener:

- When you listen to the other person with full attention, it shows that you are giving respect to that person. By giving respect to a person, you gain his respect and love. The other person in turn will listen to you carefully also.
- Listening skills will help you in knowing more about a person which can be helpful to you in professional as well as personal life. By knowing more about the other person, you increase your chance of making friends with him/her. You endear yourself in their eyes. You can improve relationships with people by being a good and sympathetic listener to their concerns and problems.

- Listening skills help in improving conversation skills and you can avoid many confusions, misunderstandings and conflicts only if you develop willingness to listen more attentively to a speaker.

1.3.4 Reading Skills

Reading skills are extremely important as they improve one's ability to communicate effectively. They are useful for immediate accomplishment like getting up-to-date information, improving writing ability. In fact, proficiency in reading is a prerequisite to good writing skill. But reading alone will not help unless we develop the ability to comprehend what we have read. Listening and reading are strictly individual traits and are often taken for granted. We can pretend to read and listen which is not the case with speaking and writing. We may be hearing a speech but not listening (with our mind); it is as much as we may be seeing a page of book but not reading it. What one reads becomes a valuable raw material for effective speaking and writing.

Reading is one of the 3R's of elementary education. Only one literally begins with the letter R, the other two R's being (w) riting and (a) rithmetic, the principle focus of reading is on comprehension or understanding.

Reading is a process:

It is a visual process: Eye movement, eye span and perception span.

It is a brain process: Word resources (or) vocabulary, background knowledge, general education etc.

An average reader reads 250 words/minute, a very good reader reads 500-600 words/minute and an exceptional reader reads 1000 or more words/minute.

Good reading depends upon:

- Sharpness of thinking facilities
- Ability to remember and retain what was read and the word power.

For effective reading: one should read twice

First a quick reading to follow the author's pattern of thinking and organization of thoughts and to get to know the general meaning i.e. overview.

In the **second reading,** you get to know particular details (what you are looking for). You can understand details more effectively and remember them more easily once you have grasped the central theme. This approach is very useful to study a subject.

Comprehension is the main aim of reading. Rapid perception and thinking help good comprehension. The Mind can also be trained for comprehension. Your word vocabulary has to be simultaneously increased. (Read regularly "It pays to enrich your word power" section in Readers Digest).

One of the best tools for rapid, effective reading is skimming. But it depends upon the purpose and also whether the material before you lends itself to skimming.

Reading skill enables to:

1. Read the written form as meaningful language.
2. Read anything fluently.

To mentally interact with the message one should have the following skills:

Comprehension skills: Ability to use context and prior knowledge to aid reading and to make sense of what one reads and hears.

Fluency skill: Ability to see larger segments and phrases as a whole, as an aid to read and write more quickly.

Critical reading skills: Ability to analyze, evaluate and synthesize what one reads and ability to see relationship of ideas and use them as an aid in reading.

How we actually read:

Reading any written material involves eye movement over the words and sentences from left to right horizontally.

Some suggestions for developing reading skills are listed below.

1. **Objectives of reading** should be clear in mind. Normally people read things in which they are interested.
2. **Use the technique of skimming** which means reading for major ideas and not each word.
3. Take brief notes along with reading to remember what has been read.
4. One should read critically and then write down his/her own views related to the concepts.

Some tips for faster and better reading:

- Make a quick survey of chapter headings, table of contents, introductory chapter, graphs, illustrations and the preface. It will give an insight about the contents and nature of the material. It also helps in deciding whether to read details.
- Learn to read by PARAGRAPHS. A paragraph generally contains one leading idea around which supporting details are arranged. Find this idea rapidly.
- Reading the "main idea" in each paragraph may be sufficient.
- If details are important, reading proficiency can be increased by organizing subsidiary ideas and facts.
- Watch for the directional word.
- A fast reader knows how to glean the essential ideas by SKIMMING.
- These readers generally have a comprehensive knowledge of the language and subject matter and know how to synthesize. They seek really essential or specific ideas or facts.

A word of caution:

- Good readers cannot read everything with the same speed.
- Reading speed depends upon reading objectives e.g.: Novels, Fiction, Economic theory etc.
- Motivation to read determines reading speed e.g.: Sports news by sports lover.
- Psychological barriers impede effective reading.

1.3.5 Documentation Skills

- In general terms, it is any communicable material (text, video, audio etc.) used to explain some attributes of an object, system or procedure. It is a tool to help individuals and development organizations learn from their own experiences.
- It is an accumulation of our rich experiences to widely share with other individuals, organizations etc. It is an organized systematic process of note taking and recording that could later be used for policy advocacy, fund raising and monitoring & evaluation.
- It is a key to knowledge management.
- It is an effective source for providing relevant information and data that could be used for all purposes.

Why is this important

- To get the message across
- To promote and mobilize resources
- To monitor, evaluate and understand the impact
- To consciously make changes in our work
- To use it for advocacy purposes
- To influence policies and practices
- To add to institutional memory
- To capture events, learning and experiences

- To generate knowledge and be an authority

Elements of Documentation

- Clarity on the subject and overall objective (what/why)
- Complete understanding of the program information (aim, time period, location, resources, actors, process, end results)
- Familiarity with various tools and techniques for generating information (FGD, Key Informant Interviews, Case Studies, etc.)
- Selection of appropriate medium (written, audio, video), format style as per the context
- Good facilitation skills
- Precise, focused, simple, and easy to understand & use
- Feeding back to the source
- Cross-checking, verifying and triangulating
- Acknowledging the source (plagiarism is punishable)

Common Skill Gaps

- Patience (rush/hurry to document)
- Sensitive to confidentiality
- Shortsightedness (unaware of its long term use/multiple use/reproduction)
- Technical skills to produce as per the need
- Creativity and innovation (resistance to change/newness)
- Quality/reliability
- Proper understanding of culture, people, location, norms
- Progressive learning (field notes, simple accounts, recording daily work, field report, progress report, professional report)
- To generate knowledge

Means of documentation

- Photographs

- Videos and documentaries
- Note taking
- Case studies
- Reports
- Articles
- Journals

Gathering Information from the field

Different Methods are used to gather data and information from field for documentation. Some of these are Focus Group Discussion, Key informant interviews etc.

Focus Group Discussion (FGD)

This is a group discussion of approximately 6-12 people guided by a facilitator. Group members speak freely and spontaneously about a certain topic among themselves guided by a facilitator. It is a qualitative method to get in-depth information on a certain topic.

When conducting FGD one needs to determine the purpose, do a situation analysis; select participants; prepare a discussion guide; nominate a facilitator or moderator and also a recorder. Focus may not be on more than one or two topics.

Key Informant Interview

This involves obtaining information from a community resident who is in a position to know the community as a whole or a particular person you are interested in. The community resident may be a professional person who works with the group, from whom you want more information or a member of the target audience. Key informants can be young or old or from a variety of socio-economic levels or ethnic groups. They can be an important source of information in research aimed at qualitative assessment. Key

informants can be interviewed in an informal way or you can use formal techniques such as telephone interviews, personal interviews etc.

Case Study

This method is used in qualitative research. It is an in-depth longitudinal examination of a single instance or event. It is a systematic way of looking at events, collecting data, analysing information and reporting the results. Different types of case studies include illustrative case studies; exploratory case studies; critical instance case studies; program implementation case studies; program effects case studies; prospective case studies; cumulative case studies.

1.4 INTER-PERSONAL COMMUNICATION SKILLS

Communication skills, involve your ability to take an idea and communicate to audience in a manner that it is understood by the audience. Inter-personal skills refer to your ability to communicate with and understand your team.

Inter-personal communication skills are very important if one wants to become a good team player and an effective leader. Listening is one part of communication which sounds fine in theory but is rare to find in practice. Empathy will help one to understand people and respond to their needs more effectively. Skills like speaking, writing and listening have already been detailed above. A few more points may be seen in the following paragraphs.

An extension worker fails to achieve results in the absence of inter-personal communication skills though he/she may be endowed with the best of the technology or even the best of the strategies. The ability to get along with others is immensely helpful for success in almost all walks of life, whether an extension worker, a farmer, a Village Developmental Officer (VDO), a scientist or a research worker. Success of an extension worker will largely depend upon effective communication which in turn depends upon inter-personal communication skills such as empathy, listening, positive attitude, perception, presentation skills, written communication skills etc.

Inter-personal communication is the process by which people exchange information, feelings, and meaning through verbal and non-verbal messages. Interpersonal communication is not just about what is actually said - the language used - but *how* it is said and the non-verbal messages sent through tone of voice, facial expressions, gestures and body language.

1.4.1 Communication is two-way

Communication is the art of sharing ideas, information, instruction or feelings. The basic ingredients of a good communication are clear thinking, clear speaking and clear writing. We spend about 75 per cent of our waking hours in some form of communication such as talking, listening, reading and writing.

There are 1 million words in English language (about 200,000 of them are technical). An average person has a recognition vocabulary of 10,000 words and a conversation vocabulary of 2000 words. However, in everyday usage most people manage a vocabulary of as little as 300 words. In everyday conversation therefore, one should choose words that are most frequently used and understood. It is also wise to keep sentences short and to the point and also avoid jargons.

1.4.2 Listen to learn – learn to listen

Average speaking rate is 175 words per minute, but we think about 400 words per minute. This gives each of us a lot of spare mental capacity which could be used to try and concentrate on what the speaker says and means. Focus on central ideas rather than details, use your spare mental capacity for summarizing the main points, anticipating what is going to be said and observing body language.

1.4.3 Concentrate

Experts in communication estimate that only about one-quarter of all listeners are able to understand the main idea when listening to a speaker. If you find your mind wandering when listening to somebody, you must get back into focus. You can use the spare capacity productively by summarizing in your mind the key concepts and ideas

the speaker is trying to convey. If you are unsure about the message, repeat it back to the speaker's satisfaction. This is called feedback and ensures that two-way communication has taken place. It is important to remember that communication does not take place until it is understood. Speaking quickly and indistinctly may also prove a barrier to communication.

We talk, listen, read and write each day but we don't give it much a thought. However, we must continually work at each of these if we are to become skilled in communication.

Ask questions; use open-ended questions. Questions beginning with who? What? Where? When? How? and why? in dealing with enquiries help us to elicit information, in order to identify and solve a problem.

1.4.4 Effective listening

Have you ever been at a meeting when nobody seems to listen to others? Often people are not really listening to each other but thinking and planning what to say as soon as other person pauses for breath. Experts maintain that the best way to make friends is to become an attentive listener. Many people fail to make a favorable impression on others, simply because they do not take the trouble to listen. Communication is a two way process and listening is very important aspect of it.

Attention: Don't permit your thoughts to stray or your attention to wander.

Semantics: This is the science, which deals with the development of the meaning of words. Do not interpret words and phrases in a manner other than that intended by the speaker.

Talk person to person: Don't be too formal. Be sincere and sympathetic in your manner. Build trust. Never breach confidence. Make the other person feel welcome and important. Use little courtesies such as 'Good morning', "please", 'thank you' and so on.

Attitude: Develop a positive attitude towards others. Don't close your mind to other people's opinions and viewpoints. Show respect for their opinions.

Get the facts: Don't prejudge a person or situation. Many people stereotype others by their nationality, color, race, religion and appearance. Listen, understand and then judge. Don't jump to conclusions.

Excessive talking: Many of us are infatuated with the sound of our own voice? We cannot listen and talk at the same time. Comment on what a speaker is saying without interrupting the flow. Occasionally paraphrase what you have heard. This provides vital feedback and ensures that the message is being received and understood.

1.4.5 Empathy

Sensitivity is probably the most important factor in successful communication. Empathy is the ability to see things from the other person's point of view. People have feelings, opinions, fears and prejudices. Empathize with them, show concern and respect. People like to be appreciated and made to feel important.

1.4.6 Self-awareness

Self-awareness is a key factor to good personal relationship. Be aware of your strengths and weaknesses. Optimize your strengths and minimize your weaknesses. You should be aware of your personal biases, likes - dislikes and shortcomings. If they are interfering with your social skills, then you must eliminate them from your behavior. Keep your emotions under control. Be cool, calm and collected. Never lose your temper with others.

1.4.7 Communication model

In basic communication model there is a sender, a message and a receiver. In other words, a speaker, words and a listener. First a sender conceives an idea, which should be translated into words. The effectiveness with which a sender conveys a message will depend on the choice and appropriateness of words, vocabulary, tone and gestures. All

these factors help to project the message with precision and clarity. A message may be distorted, ignored or misunderstood, if any of these are mishandled by the sender.

The message consists of words and non-verbal cues. It is important to remember that words can create understanding and inspire people to great deeds or they can create misunderstanding, distrust, annoyance and bad feeling. So words must be chosen with care and discretion.

For example:

- Words mean different things in different contexts. In the context of a training program, 'course' means curriculum, but in the context of a horse or a greyhound race it means route. Therefore the meaning of words often depends on the context.
- Words mean different things in different cultures.
- Words mean different things to different people. A bull to a farmer means livestock. On the other hand, to a stockbroker, it means a person who buys shares.

The third element in the communication model is the receiver. Involvement of a receiver can be considered in three ways. Firstly, the receiver recognizes what the speaker is saying and tunes in. Secondly, the receiver interprets meaning of what is being said by mentally summarizing and reorganizing the idea. Thirdly, the receiver understands the message, which has been assimilated, associates and consolidates with existing knowledge and only then responds to what has been said. Sometimes mishaps can occur at any stage and interfere with message. This is the communication cycle.

1.4.8 Verbal and non-verbal communication

The experts tell us that only 35 per cent of what we mean is in the verbal message. The other 65 per cent of the meaning is contained in the non-verbal communication. Facial expressions, eyes and other body movements must be considered when interpreting meaning. In any social interaction with other people you must be aware of the non- verbal cues and signals. Psychologists have been paying increasing attention to

these non-verbal aspects of communication. The following are some of their findings.

Boredom: The hand over mouth to cover a yawn can mean boredom. Glances at watch, frequent re-crossing of legs, constant repositioning on seat, fidgeting and eyes wandering can also indicate boredom, disinterest, impatience or tiredness.

Arms folded: Folded arms usually indicate resistance, or being defensive. But it can also mean other things.

Frown: A frown may suggest disagreement, lack of understanding or annoyance. You can back up and restate your last point. You can pause and ask for questions, or ask to clarify their points.

Upward glance: Watch peoples' eyes. Upward glances may mean "I have heard that before". Eye contact is essential for good communication.

1.4.9 Memory

An average person has a poorly trained memory. Long-term as well as short- term memories are important factors in communication. Research has shown that we forget 50 per cent of what we heard within an hour.

1.4.9.1 Encouraging people to like you

Positive Thinking

Many books have been written about the power of positive thinking. Think positive experiences. Think about your successes rather than your failures. Develop a mindset for success. Positive expectations are more likely to lead to positive outcomes. Positive thoughts precede positive actions and positive actions produce positive results. Negative expectations are more likely to lead to negative outcomes. Unless you have a favorable image of yourself, you cannot impress others favorably. Develop faith in your own ability to handle colleagues and bring work task to completion. The more successful you are, the more confidant you will become in future. Don't underestimate yourself.

Show Interest

Take genuine interest in the people around you and in the work environment. Encourage them to talk about themselves and their achievements. Disraeli said: Talk to a man about himself and he will listen for hours. Develop a friendly and helpful attitude. Always try to be sincere. Be positive.

Remember to smile

Smiling facilitates positive thinking by giving you a psychological lift. You can't smile and entertain negative thoughts at the same time. Develop a cheerful disposition.

1.4.9.2 **Name:** People like to hear the sound of their own names. One of the best ways of creating goodwill is to remember names and use them. Remember names, relate them to the person and repeat the name frequently during a conversation.

1.4.9.3 **Manners:** Good manners are a sign of good breeding. Like smiling, good manners cost nothing but reap many benefits.

1.4.9.4 **Learning is a lifelong continuous process:** Seek out opportunities for self-development, not only in your work life but also in your personal life. Don't procrastinate.

1.4.9.5 **Practice:** Practice the previous advice. Learning is an active process. We learn by doing. Knowledge that is used only stays in your mind.

1.4.9.6 Some experts maintain that the ability to handle people is three times more important than the technical expertise in determining suitability of people for senior managerial positions. So all the technical knowledge (or job knowledge) in the world is of relatively little use if you aspire for senior management, without the social skills to handle people.

1.4.10 Handling of people

Tact. Don't argue. The best way to win an argument is to avoid it. Let the other person do most of the talking. Use feedback technique. Ask questions in a friendly voice. Use

an open-ended questioning technique – Why? What? When? Where? How? and Who? Arguing encourages emotional responses such as anger. Anger leads to irrational behavior and anything that encourages anger should be avoided.

Respect: Show respect for the other person's feelings and opinions. Tact and diplomacy are the watch words. Never say directly, or suggest to a person, 'You are wrong'. You could say 'you may be right, but let's look at the facts'. Nobody likes being told directly that they're wrong, especially in front of a third party. You may praise but never criticize in front of others.

Empathize: See things from the other person's point of view. How would you feel if you were in their shoes? That is what empathy means. Think ahead and anticipate reactions. Henry Ford said: 'If there is any one secret of success, it lies in the ability to get the other person's point of view and see things from his angle, as well as from your own'.

Simple: Speak in simple language. Keep it short and simple. Avoid jargon or technical terms. Don't try to impress others by using big words. Always use simple words in preference to long words. Keep your sentences short. Big words and long-winded sentences amount to confusing others as well as yourself.

Praise: Most people are very reluctant to praise others, even when it is due. Treat people as winners and they will live up to your expectations. A sincere compliment for work well done is a boost to morale and an incentive for sustained excellence in future. If you criticize for whatsoever the reason, always soften the criticism with praise first. Criticize the act, not the person.

Appeal to senses: Involve the other person. Appeal to as many of the senses as possible – hearing, sight, taste, smell and touch. When making a presentation to a group use visuals-a picture speaks thousand words. Remember the old proverb: 'I hear, I forget; I see, I remember; I do, I understand'.

Synchronization with listener: Watch for body language and non-verbal

communication. Try to synchronize your words with the speed of receptivity of the listener (you can gauge this from the actions and expressions of a listener). Mirror your body language to that of the other person.

Sell: Make the other person feel the idea is theirs. This is the best way to implement your ideas. Use open-ended questioning technique to obtain viewpoints. Concentrate and develop those on which there is a common ground and agreement. Show what's in it for them. Most people are motivated by self-interest.

1.4.11 Making an impression on others

The critical points about making an impression on other people are:

Posture: Your posture can indicate clearly whether or not you are going to be friendly and helpful. Indifference, nerves, restlessness and lack of confidence can all be indicated by posture.

Look, listen and learn: Listen for the words in the entire message and observe the accompanying body language. Pay attention to what they say and show that you are really interested in them. People prefer to talk about themselves, rather than to listen you. Don't interrupt the speaker or change the subject else you might show lack of interest which may create resentment.

Expression: Most people look at your face, particularly the eyes, at some point during your conversation. Remember, your face and eyes reveal your feelings. They show the other person not only how you feel about yourself – tired, interested, uninterested – but also how you feel about the other person. It's polite and a sign of attentiveness to look at the person who is talking to you (but avoid staring). Looking at a person also gives you an opportunity to notice their expression. A smile, especially when greeting someone, can be the biggest icebreaker of all.

Appearance: When somebody comes up to you, you and your work area both are in view. Do you give the impression that you are friendly, neat, well-groomed, smart and organized? Remember, if you look untidy, your work may be untidy too. People act on

impressions. Make sure that you are neatly groomed and look after your appearance and personal hygiene.

Speech: Your first word creates an impression, which decides the other person's reply. If they are friendly and positive, they invite a smile and thanks from the other person. Nothing is more annoying than unhelpful, negative remarks. To be heard and understood, you need to speak clearly and look at the person as you speak. Do not use bad language or slang in conversation. If you use bad language you will let yourself down and people will judge you by the way you speak.

Eagerness to help: Adopt a positive attitude and helpful manner in your dealings with people. Show in a positive way that you are enthusiastic, eager and willing to help solve problems. If you want to make friends you must be obliged, unselfish and thoughtful.

Consequences of poor inter-personal communication skills: Stress, Lack of communication, Irritation, Close mindedness, No team spirit, Lack of credibility, Poor self-esteem, Suspicion, Loss of productivity, Isolation, Poor health, Distrust, Anger, Prejudice, Un co-operative behavior, Conflict, Frustration, Unhappiness.

1.5 CONCLUSION

Communication may take different forms. It may be verbal or non-verbal, written or oral, formal or informal. Around 65 per cent of our communication is non-verbal or through body language. Extension personnel need verbal, non-verbal and inter-personal skills for effective communication.

Various media are used to communicate news and information and can be categorized into: print media, electronic media and online media. While basic principles are the same, each medium has its own style and the audience is varied too. Whether we are writing for print media or scripting for radio or TV, determining the purpose and having the audience in view is important. The content, presentation, format, style of writing, language should suit the audience, we are writing for.

1.6 LET'S SUM UP

Communication skills are very important if one wants to become a good team player and an effective leader. Communication may be verbal which includes oral and written or non-verbal i.e. use of body language. Extension Personnel need verbal, non-verbal and inter-personal communication skills for effective communication.

1.7 CHECK YOUR PROGRESS:

1. Distinguish between Formal and Informal Communication.

2. What are the forms of formal communication?

3. Name 3 components of non-verbal communication

4. What is Grapevine communication?

5. What is inter-personal skill?

6. What are some of the inter-personal skills that an extension worker must have?

1.8 FURTHER READINGS/ REFERENCES/ LINKS

1. CTA, 2015. Embracing Web 2.0 and Social Media: a life changing pathway for agricultural Development actors.
2. Malone, SA. (1997). Mind Skills for Managers, Gower publishing.
3. MANAGE (2017). Harnessing Social Media for Agricultural development. MANAGE.
4. Moorhead Gregory and Griffin W. Rocky (1999), Organizational Behavior, AITBS Publishers & Distributors, New Delhi.
5. Robbin, P. Stephen (1998), Organizational Behavior, Prentice Hall of India, New Delhi.

6. USAID, (2013). Social Media handbook for agricultural development practitioners Dustin, Andres and Josh Woodard.

7. http://www.managementstudyguide.com/components-of-communication process.html

UNIT-2

BARRIERS TO COMMUNICATION

Highlights of the Unit

- Objectives
- Introduction
- Barriers in Communication
- Overcoming Barriers to Communication
- Conclusion
- Let's Sum up
- Check Your Progress

- Further Readings

2.0 OBJECTIVES:

- To acquaint the learners with different forms of barriers in communication
- To familiarize them with the means to overcome such barriers in communication

2.1 INTRODUCTION

This module discusses about the factors that act as barriers to communication. The barriers are categorized into four categories such as Physical, Psychological, Semantic and Organizational barriers.

2.2 BARRIERS IN COMMUNICATION

Communication is deemed to be effective when it achieves its objective. Within the process of communication, it is apparent that barriers or obstacles do occur, which either can be avoidable or unavoidable; therefore an individual should inculcate all the required skills, attitudes and traits so that he can effectively overcome all the barriers to communication. Thus, we can conceptualize effective communication as one where we are able to achieve our pre-determined objectives. No matter how much effort we make to communicate effectively, some barriers do often affect the process of communication. In certain situation, we may fail in our attempt to communicate because of some factors. These are known as barriers to communication.

Thus, we may define communication barriers as those factors/ obstacles which hinder the process of communication. They can be classified into four categories – (a) Physical/ Mechanical barriers, (b) Psychological barriers, (c) Semantic barriers, (d) and Organizational barriers.

2.2.1 Physical/ Mechanical Barriers: These include all those factors which physically obstruct transmission/ transfer of message or signal from a sender to the receiver. Examples of physical barriers include:

2.2.1.1 Noise: It is any random or persistent disturbance that obscure, reduces or confuses the message being communicated. It may include any undesired sound or interference during the exchange of information or transmission/ reception of signal. Noise may be any (physical) disturbances - any unnecessary sound, physical interference, - at the site of communication, particularly during an inter-personal communication. Communication through mass media may also be obstructed by disturbances during transmission of signal as in the case of a radio or a television. Even signal transmission through telephone may also be obstructed through some technical fault in the telephone lines. That's why 'noise' is sometimes identified as one of the single largest problem in communication.

2.2.1.2 Physical disability: Disability of a person (sender or receiver) may also become a barrier in certain situation. For example, a person who is deaf may face difficulty in receiving the communication. A person who stammers may not be able to communicate clearly and this disability will adversely affect his delivery of speech and it will create problem at the level of receiver.

To overcome this situation, a communicator has to rely more on the body language, facing the receiver directly (straight-on), use of short and simple sentences, reduce the pace of speech delivery and making sure that the hearing aids, if any , being used by receiver/s, are working properly.

2.2.1.3 Bad/Extreme weather conditions: Sometimes extreme weather may create a situation in which sending and receiving of any message may be negatively affected. This

may include storm (sand storm, hailstorm), heavy rains, very high temperature during summer or very low temperature during winter. These adverse climatic conditions will have negative impact on the ability of a sender to send a message or the ability of a receiver to receive the message. This will not only create physical barriers during message transfer and reception but will also adversely affect the comfort level of the sender and the receiver to send/ receive any stimuli or give feedback.

2.2.1.4 Choice of medium: If a person is not familiar with the media, the medium itself may become a barrier for the receiver. Alternatively, if a sender is not skilled enough in the use of media, he will not be able to make good use of the media while communicating.

2.2.2 Psychological Barriers: This includes those conditions/ situations wherein interpretation of the message is adversely affected as intended by the sender. The examples include:

2.2.2.1 Stress: When a person is under stress, his behavior and thinking will not be normal. Consequently, he may intentionally inject something (add some unnecessary words or meanings) which may be misunderstood. Stress may compromise his ability to think, communicate as well as receive communication.

2.2.2.2 Anger: This may lead to aggression, which will ultimately affect an individual's capability to communicate adversely. It may involve lots of moralizing and preaching, ordering and threatening and even commanding and directing.

2.2.2.3 Prejudice: This refers to unreasonable dislike or preference of a particular group of persons or things over others. It may be a reason for bias towards a person based on past experience, caste or community. This may consequently affect ability of a person to communicate or interpret the message properly and impartially.

2.2.2.4 Attitude: It is the mental disposition of a person towards something, be it a person or an object. A negative attitude will have an adverse or undesirable effect on the communication ability of a person to interpret the communication received. It may lead

to some misunderstandings or give an inappropriate feedback about a message received / communicated.

2.2.2.5 Inferiority Complex: It refers to a feeling of inferiority in the sender of a communication. Due to this feeling, a communicator may feel depressed, have low self-esteem or may have a fear of rejection. This will ultimately be negatively reflected in his ability to communicate.

2.2.3 Cultural Barriers: A culture is defined as the sum of social heritage. Every culture has its own rules and regulations about acceptable behavior in the society. Norms, values and belief system are part of one's culture and it governs their life and lifestyle. Some of the cultural barriers are discussed below:

2.2.3.1 Stereotyping: It refers to having a set of pre-conceived notions, assumptions, or fixed image about a person or a group of persons. There is a tendency among people to have pre-conceived notions about someone or being biased. This affects exchange of information between a sender and a receiver. A very good idea may be ignored by a receiver just because of having a stereotypical image of the sender or vice-versa.

2.2.3.2 Values: The different socio-cultural values and behavior may also create problems in communication. So while communicating with people from different cultural backgrounds, we have to ensure it does not go against the values and norms of the people.

2.2.3.3 Ethnocentrism: This refers to the tendency among people to consider themselves or their culture superior to others. This may become a barrier to communication, especially in case of inter-personal communication in face-to- face situation. People may just ignore what you want to communicate or switch-off mentally leading to break down of communication.

2.2.3.4 Body Language: Use of appropriate body language can help increase effectiveness of communication. However, there may be some aspects of body language which can adversely affect communication and become barriers to communication itself. For example, eye contact or use of certain gestures and posture may not be acceptable in some

cultures and therefore, may communicate wrong message, or lead to misunderstandings. For example, in U.S., people look at each other in the eyes while speaking whereas the same may be misunderstood in Indian context as being aggressive or even intimidating.

2.2.4 Semantic Barriers: Semantics refer to the meaning that we assign to words, concepts or objects. A semantic barrier occurs when a person chooses some words or assigns meaning to them which are not shared by the receiver. It includes those factors which alter meaning of the message not intended by the communicator. A person communicates according to his/ her own understanding of the words, meanings, experience or exposure. The words, signs, symbols and meanings are encoded by a communicator and they may be different or not shared in equal measures by the receiver. It may include words we use and the meanings we attach with those words. Semantic barriers may include:

2.2.4.1 Language: Misunderstandings as well as differences are common among people, even though they speak the same language. Use of appropriate and accurate language is therefore, necessary for communication. Language is a type of figurative phrase used to communicate shared meanings and explain core concepts and contexts. Typically we are accustomed to the use of a particular language or its dialect; and if this is not understood by a receiver, it becomes a barrier to communication. Communication will take place only if the language used during the communication is well understood by both the parties. Sometimes, regional accents and tones can itself be a barrier to communication.

2.2.4.2 Use of jargon: Jargon refers to technical words often used during conversation. It usually happens that people working in specific situation or context uses some words, or attach meaning to some words which are universally not understood. Therefore, during the process of communication, some of the technical terms/ words may be unintentionally used by a sender which may not be understood by a receiver. So these words may become barriers to communication. For example, a veterinary doctor while explaining about the care to be taken during an infection or disease in cattle to farmers

may use certain technical words which may not be understood by them. So it becomes a barrier to communication.

2.2.4.3 Assumptions: Everyone has certain assumptions about a person or a situation. The sender's viewpoint or reference may not necessarily be shared by the receiver, so this will become a barrier to communication. For example, in a classroom situation, teacher normally takes it for granted that the students know about basic things or concepts, and it would be just enough to explain advanced concepts related to it. However, just telling students about a new concept may not be enough, it may be necessary to relate it to his prior knowledge, understanding or exposure. These unclarified assumptions, thus, becomes a barrier to communication.

2.2.4.4 Inappropriate body language: When we communicate, body language is essentially involved in it, intentionally or unintentionally. Body language is one of the critical and most important component of communication. It may include eye contact, use of gestures and posture, head-nods, facial reaction etc. Good understanding of appropriate, relevant and proper use of body language will greatly facilitate communication. However, its misuse can result in serious problem and misunderstanding leading to breakdown of communication. Any difference in understanding of body language will therefore become a barrier to communication. For example, a sender (a male) making long eye contact while communicating with the receiver (a female) may be misunderstood by the receiver, or use of head-nods for seeking approval in a specific way may communicate different meaning to a message. Even use of certain gestures and postures can communicate different meaning during communication. It can lead to misunderstandings and become a barrier to communication.

2.2.4.5 Feedback: Feedback from a receiver, in any form, provides an opportunity for the sender to understand and know the fate of his efforts at communication. Inadequate and improper feedback from a receiver may create confusion in the mind of the sender that the message has either not reached the receiver or not understood by him or her. It may

be immediate as in case of inter-personal communication or delayed as in case of mass mediated communication. However, if feedback is not given on time or not directed towards the sender, it may be a wasted effort. An improper and inadequate feedback will, therefore, become a barrier to communication. A badly expressed response may derail the process of communication.

2.2.5 Organizational Barriers: The success or failure of an organization is dependent on effective communication within the organization. Communication is not so simple, so as to be universally understood by all. In an organizational context, it may be required to communicate different messages or instructions to different people in different situations, across different levels of an organization's hierarchy. However, it is not as easy as it may look. Failure to give clear cut communication may thus become a barrier. For example, a simple head-nod by a boss may indicate an approval, while a sudden jerk of the same head (from the same person) will communicate a different meaning. The major barriers to communication in an organizational context are as follows:

2.2.5.1 Status Difference: If there is too much difference between the people communicating, it becomes a barrier as it affects willingness of the person to communicate. That's why protocols are followed in organizations to help in better and effective communication.

2.2.5.2 Poor listening and premature evaluation: While communicating, you should not only listen but also seem to be listening. This will encourage the person to communicate and share what he/she wants to communicate. Do not jump to any conclusion before the person has finished speaking as this will discourage. So poor listening and premature evaluation will become a barrier to communication.

2.2.5.3 Gender difference: Men and women, while communicating, adopt different communication styles. Inability to understand and adapt to the differences can limit communication. This may have to do something with the behavioral perceptions, as much

as gender stereotyping. Thus, gender gaps and traits can become a barrier to communication. It can be critical for organizations requiring team work.

2.2.5.4 Organizational culture: It affects capability as well as loyalty of an individual towards the organization. The openness, communication climate, policies and structure within the organization may become barriers to communication within the organization.

2.2.5.5 Information overload: Too many messages communicated too frequently to an individual over a period of time creates information overload. If a person is burdened with lots of messages, it may lead to poor communication.

2.2.5.6 Inter-personal mistrust among the employees: For any organization to be successful, inter-personal trust is essential. In its absence, the sender/ receiver will derive different or opposite meanings and communication will become meaningless.

2.3 OVERCOMING BARRIERS TO COMMUNICATION

Everyone desires to communicate effectively and efficiently but do not make efforts to overcome these barriers. Consequently, it leads to failure of communication or frequent breakdown of communication. Simply taking note of these barriers will not be enough, but making a conscious and deliberate effort to overcome them will bring the desired results. These barriers can distort a message or misrepresent intention of the sender, leading to misunderstanding or failure of communication. Thus, any task or transaction which requires more than one person to be involved will be successful only if we take into account these barriers to communication. In order to actively avoid these barriers, we should do the following:

1. Be a good listener. One must not only listen carefully but should also seem to be listening. Learn to listen and listen to learn. Paraphrase as and when required.
2. Message communicated should be consistent with the receiver's past experience and exposure. Besides, proper encoding and treatment of a message will go a long way to enable receivers to understand/comprehend it.

3. Clarify ideas before communicating. Nothing should be taken for granted.
4. Communicate according to the needs of the target audience. No information overload.
5. Use appropriate language which is easy to understand. Process of communication needs to be planned very carefully and meticulously. Remember, effective communication is a conscious and deliberate attempt.
6. Ensure proper feedback. Plan for opportunities for adequate and timely feedback from the target receivers. Ensure to attend to the feedback and resolve the issues, if any.
7. Ensure proper and adequate follow-up.
8. Empathize with the receiver.

By adopting these strategies, barriers to communication can be effectively overcome. It will lead to an efficient and effective communication.

2.4 LET'S SUM UP

Communication is a process of social interaction through which we exchange opinions; share our emotions or feelings and transmit ideas. It helps in creating a mutual understanding and space in the society to conduct ourselves in society. The purpose of communication will not be achieved if a receiver fails to understand the purpose of communication as intended by the sender.

However, this process may be adversely affected by some factors which are known as barriers to communication. These barriers to communication were classified into four categories – physical, psychological, cultural and organizational barriers. Physical barriers include noise, physical disability, bad or extreme weather conditions and skill to use the selected medium of communication. Psychological barriers are anger, stress, prejudice, attitude and inferiority complex in the sender of a message. Cultural barriers are stereotyping, values, ethnocentrism and body language. Semantic barriers include

language, use of jargon, assumptions, inappropriate body language and feedback. Lastly, organizational barriers are status and gender differences, information overload, and organizational culture, inter-personal mistrust among employees and poor listening and premature evaluation. It is essential to overcome the barriers by identifying the causes that give rise to them. Some of the barriers are avoidable whereas some are unavoidable; hence an individual is not left with any option but to face the barriers. If we take note of these barriers during communication, we will be successful in achieving the goals of communication.

2.5 CHECK YOUR PROGRESS:

1. Define barriers to Communication. Enlist different categories of barriers to Communication.
2. What do you understand by physiological barriers to communication? Explain with an example.
3. Describe various organizational barriers to Communication.
4. What do you understand by semantic barriers? Describe some semantic barriers to communication.
5. How to overcome barriers in communication?

2.6 FURTHER READINGS/ REFERENCES/ LINKS:

1. Keyton, J. (2010). Case studies for organizational communication: Understanding communication processes. New York, NY: Oxford University Press
2. Kneen, J. 2011. Essential skills: Essential speaking and listening skills. New York, NY: Oxford University Press
3. Leagans, J. Paul. 1961. The Communication Process in Rural Development. Cornel University Press. 35 p.
4. Rogers, E.M. and Shoemakers, F.F. 1971. Communication of Innovation: A cross cultural approach. New York: Free Press. 476 p.

5. Smith, C. (2015). The Seven Barriers of Communication. Retrieved June 19, 2015 from http://guides.co/guide/the-seven-barriers-of-communication.
6. Usman, T. (n.d.). Barriers to Effective Communication. Retrieved June 20, 2015 from http://www.uet.edu.pk/export/sites/UETWebPortal/qec/qec_intro/downloads/Barriers-to-Effective-Communication.pdf

BLOCK III: ROLE OF MASS MEDIA IN DISSEMINATION OF FARM TECHNOLOGY

UNIT-1

ROLE OF MASS MEDIA AND ITS OPERATIONALISATION

Highlights of the Unit

- Objectives
- Introduction
- Concept of Mass Media
- Types of Communication Media
- Role of Mass Media in Dissemination of Farm Technology
- Media Strategy
- Media Selection Process
- Media Mix for Rural communication
- Modern versus Traditional/Folk Media
- Conclusion
- Let's Sum Up
- Check Your Progress
- Further Readings

1.0 OBJECTIVES

- To orient the learners about concept of mass media and its types
- To develop an understanding about role of mass media in dissemination of farm technology
- To familiarize them with traditional/folk media vis-à-vis modern media

1.1 INTRODUCTION

During the last few decades, means of communication have been revolutionized and the process still continues. The advent of green revolution in India during mid-sixties, necessitated publication of journals, newspapers, periodicals etc. along with electronic media in regional languages for speedy dissemination of farm technology to the farming

community, extension functionaries and others engaged in agricultural development. All these media have played valuable role in promoting scientific, agricultural and rural development.

A wide range of electronic communication technology which can bring about meaningful revolution and improvement in information transmission is now available. Many of the organizations in developing countries may not be in a position to make use of all the latest innovations. The developing countries in collaboration with large business organizations should chalk out a phased programme for introduction of new communication devices into their organizational structure to make communication effective.

The most significant new technologies are those based on silicon chip, laser, fibre optics and a set of technologies known as bio-technologies. It is necessary to introduce the latest and sophisticated communication technologies in collaboration with other countries. Developing countries must realize the importance of new communication technologies for speedy, correct and low cost transmission as well as for imparting education, to catch up with the advanced countries of the world.

The process of technology transmission is enhanced greatly by voice, data and video capabilities made available by satellite and micro wave transmission. Though the government has spent billions on different development programmes still a lot has to be achieved in terms of uplifting the living standards.

Thus, there is relevance of media for professionals on the farm front for the development of the sector. An interface between media managers and agricultural professionals will go a long way in developing journalistic talents in the changed context. The task of creating and encouraging attitudes and providing adequate information is being increasingly entrusted to the mass media.

1.2 CONCEPT OF MASS MEDIA

1.2.1 The Concept of Mass

The word 'mass' has both positive and negative meanings. Its negative meaning comes from its use to refer to the mob or multitude, especially the mass of the ignorant and unruly. Mass connotes lack of culture, of intelligence and even of rationality. In its positive sense, especially in the socialist tradition, it connotes the strength and solidarity of ordinary working people when organized together for political ends. Mass is an 'aggregate in which individuality is lost', or 'group', 'crowd' or 'public'. Mass, consists of large number from all social strata and demographic groups. Relevance of mass communication comes mainly from the meaning of multiple or mass production and the large size of the public reached by media.

1.2.3. Functions of Mass Media

The three basic functions of mass media are:

i. To inform
ii. To educate
iii. To entertain

i. To inform

Information is the most important function of mass media. People read newspaper to know about what, when, where, who, why and how things are happening, pertaining to personalities or institutions. It brings about greater awareness among the masses about men and materials. Development in community, Government, politics, business, sports, entertainment, agriculture, industry and other spheres of human life are important for people to increase their knowledge.

ii. To educate

The development of mass media and progress of education are intimately related in many ways. Mass media educates people by giving information about food, health, housing, sanitation, employment, agriculture, industry, environment, science,

technology, modernization etc. Print media's predominant source of education is through newspaper, journals etc. Electronic media like Radio, television, film etc. are not lagging behind in educating the masses. Radio is very useful source of information and education both, in urban as well as rural areas in developing countries.

iii. To Entertain

Mass media also entertains people. i.e. film, television, radio entertainment. Television is the nation's number one entertainment medium.

Other functions

Harold Lasswell (1967) a political scientist who had done pioneering research in mass media communication has noted 3 major functions.

i. **Surveillance of the environment**: means collection, distribution of information concerning events in the environment, both outside and within a particular society.
ii. **Correlation of the part of society in responding environment:** Interpretation of information and the environment prescription for reaction to these events.
iii. **Transmission of social heritage from one generation to another generation**: Lasswell says transmission of culture, focuses on communicating information, values and social norms from one generation to another generation.

Communication media deals with communication which is of the people, by the people and for the people, in a democratic sense.

- Medium/media means something through which an effect is produced or is made known.
- Mass media denotes those channels of communication that reach large number of people, such as television, newspaper, radio, cinema etc.
- Media in relation to communication implies tools of communication. It means the instrument adopted or applied in transmitting any message, irrespective of its nature and significance.

- The message part of the communication is very important in communication media. The media of communication takes the form of symbols, words, action, numbers, etc.
- The symbols are used as media for exchanging information between different persons. Among them, words are the most commonly used and the principal communication instrument of all employees. Communication by words may be verbal i.e. oral or written. Both oral and written media have their own advantages and disadvantages. Picture media consisting of charts, blue prints, graphs, visuals etc. are more useful aids. Similarly action is also a symbol used in communication. It is a form of non-verbal communication. A speaker must also remember that actions speak louder than words. Silence, a nod, a wink, a handshake, a smile, grimace etc., themselves speak. The important communication media are indicated below.

1.3 TYPES OF COMMUNICATION MEDIA

Media or Channel is the means by which a message gets from a source to a receiver. There are 2 types of channels.

Mass Media Channels		**Inter-personal Channels**	
Electronic Media	**Print Media**	**Localite**	**Cosmopolite**
Ex: Radio Television	Ex: Newspapers, Folders Leaflets Success stories	Ex: Relatives Friends Local progressive farmers	Ex: Government Extension Agencies

Mass media are creators of awareness and information, while inter-personal channels help in evaluating communication message to facilitate in taking action on the message. Mass media denotes those channels of communication that reach large number of people such as television, newspaper, radio, cinema etc.

The main role and responsibility of the media is to transmit messages to the receiver. Mass media endeavor is to send information to the public at large. Mass media not only informs but persuades. Mass media are used for entertainment and commercial as well

as non-commercial purposes. Without mass media there would be no social, economic and political system. The important media that play a vital role in communication are:

1. Newspapers → Print media
2. Radio → Broadcast media
3. Television → Broadcast media
4. Cinema & film → Broadcast media
5. Computer → Electronic media

The following are the important communication media used for transfer of agriculture technology

Print Media

- **Leaflets:** A leaflet is usually a single sheet of printed matter, sometimes folded. It gives accurate or specific information on a particular topic.
- **Pamphlets:** A pamphlet contains 4 to 12 pages stitched or stapled at the center. The pamphlet varies in size from 12 to 24 pages. The difference is arbitrary, and one may sometimes refer to a leaflet as a pamphlet or it may be the other way round.
- **Circular Letters:** Circular letters give personal approach to the extension message. Receiving a letter is an important event for village people. Use letters as an effective method to convey information of common interest to large number of literate people at the same time.
- **News Letters:** A newsletter deals with the current items of interest and normally is printed periodically. Newsletters deal with more than one subject, are printed in large numbers and distributed in many ways.
- **Folders:** A folder is a single piece of paper folded once or twice. When opened, material is presented in sequence. Make sure this sequence appears in the finished folder. If not, a reader may get confused.

- **Bulletins:** A bulletin conveys a large amount of information. Its primary objective is to give information which a reader can apply to his own local situation. It is a booklet running into more than 20 pages.
- **Farm Journals:** Farm journals are an important tool to disseminate relevant development messages to the rural audience. A farm journal suffers from a number of problems viz. financial problems, delayed publication, lack of trained farm journalists, technical jargon etc.
- ***News Stories:*** News is any timely information that interests a number of persons, and the best news is one which has the greatest interest for the greatest number. It is an accurate, unbiased account of the main facts, of a current event that is of interest to the readers of a newspaper.
- **Newspaper:** It is a bunch of loose printed papers folded, which contains news, views, advertisements etc. and is offered for sale at periodical intervals, either daily or weekly.
- **Banners:** Banners are traditional mass media, a visual source of information in India. One needs only to walk down a village, rural areas or a town to see banners flying, advertising everything from meetings to meat shops.
- **Calendars:** Calendars are widely distributed in most countries of the world as an advertising tool. Hence they should not be overlooked by extension workers. They are constant, year-round reminders of messages. A crop calendar provides timely information about seeds to promote local crop production. It contains information on planting, sowing and harvesting period of locally adapted crops in specific agro-ecological zones (FAO).

1.4 ROLE OF MASS MEDIA IN DISSEMINATION OF FARM TECHNOLOGY

Rural development is aimed at development of the area and the people as a whole. When we talk of media & rural development we look at two dimensions of development i.e. development of rural areas and the role of media.

i. Exposure to rural programs through media.

ii. People's active participation through mass media.

There is a need to bring awareness about developmental programs so that they can actively participate in the developmental process.

Rural people do not constitute homogenous groups. For effective media usage it is necessary to find out different languages, backgrounds which would focus on different themes of rural development to reach rural masses.

1.4.1. Radio - A tool for development

Even though All India Radio broadcast multiple programs, developmental programs relating to rural poor cover a very small proportion. In the recent past, AIR has been an institution of 53 rural radio broadcasting stations in the country but the discouraging trend is that there is only 5.4 % direct support for rural development.

Writing for a radio

Writing news for radio is different from writing for the newspaper. A newspaper reader has your words before him and he can read them at his pace. He can go back and read it all over again if he misses any point, but not so with the radio. There is no chance for him to go back and start from the beginning. That is why one has to write news for a radio such that it suits to the ear and not the eyes. It has to be short, simple, direct and with familiar words. In other words, it has to be made very, very simple.

Write it in the way you would say. Speak aloud to your friend or a group of people. Remember, it is a voice-to-ear method of communication. A news script has to be 'listenable' just like the written words have to be 'readable'. Let us take a few examples.

Readable: A bullock –drawn reaper for harvesting wheat has been designed and developed by Research and Training Center of Punjab Agricultural University at

Ludhiana. The machine has been successfully tried on the University Farm and steps are being taken for its production on a commercial scale.

Listen able: A bullock-drawn reaper has just been developed. The machine is for harvesting wheat. The reaper has been designed and developed at Punjab Agricultural University at Ludhiana. The machine had worked successfully at the University Farm. Steps are now being taken to produce it in large numbers for sale to farmers.

Script for a talk

A straight talk on the radio is an indirect talk with an unseen listener. It is a one-way communication. Therefore, local dialect must be used like Bhojpuri, Dharwad Kannada, Telugu, coastal Telugu, Rayalaseema Telugu etc.

Thousands may be tuned in to your station and to the programme. But you have to address your talk to one, two or to a small group of listeners. You have to mould the talk as if you are sitting round the table with the listeners and chatting.

- First select a topic
- It must be something that you can cover in few minutes.
- It has necessarily to be of interest to a very large number of listeners. Ex: significant crop or livestock development, agricultural situation, demonstrations, success stories, current problems, research station stories, meetings held or to be held, questions asked, new farm or home publications, current angles of a project, crop and livestock competitions, activities of farmer's clubs, women's clubs and youth clubs.
- A five-minute talk is ideal for a radio. A talk should never go beyond ten minutes at any cost. 120 words should be a good average for a minute.
- Your talk should have about 600 words. You can have an additional 50 to 100 words as a stand-by, in case you finish reading earlier than your allotted time.

- Write down the central fact or point as a complete and definite guiding statement before composing your talk. Select two or three supporting points, which will strengthen the main statement.
- Then write the script. When you write, write as if you are talking to a person in his own home, someone whom you know personally.
- Make your script clear and convincing, and your arguments logical. The script for a radio talk should have your idea stated at the beginning itself so that the listeners have no doubt at all, of what you are going to talk about. Having done that, you enlarge on the main idea, provide supporting ideas. Finally, summarize clearly what you said.
- Make your facts and statements convincing. Give logical reasons for making them.
- Cite examples. Quote authorities. Give instances when what you said was put into practice with success. Point out the results of experiments, trails, demonstrations and research surveys. Give local places, names of local people, local examples.

Do not give an impression that everything to be said about the subject has been said in the talk. Make the listeners seek further information about it, either by contacting the specialist or asking for a leaflet.

Farm and Home units

Selected AIR stations provide relevant and problem-oriented farm information to farmers of a small, homogenous area, with similar agro-climatic conditions. Rural programs are broadcasted almost in all regional languages and local dialects. Farm & Home units broadcast and telecast programmes on agriculture practices, scientific methods of cultivation, soil and water management, fertilizer application, plant protection measures, DPAP schemes, dry farming, topics on health, nutrition etc. Most of the programmes are need-based, field-based, area-specific and audience-specific. Akashavani and Doordarshan have their audience research units for feedback.

1.4.2 Television

Television has unique advantages over other mass media. It provides sound, vision and movement. It can reach largest number of people in the shortest possible time. It is a medium unlike any others. T.V. screen is small and depends on close-ups. People can watch sitting in their homes. Television viewing does not demand extra strain and the messages are pre-selected, sorted out to present in a simple manner. The medium is quite suitable for subjects that require dramatized presentation, identification of objects, live demonstration of complex technical processes depicting animated presentation and presentation of experiences, places, processes; unfamiliar to viewers. A good television program should have an attractive title, relevant to season, clear voice, suitable appropriate visuals and scientific backstop.

1.4.3 Doordarshan

- Doordarshan has now reached an estimated 82% population through its network.
- Future plans lay emphasis on including area specific television services for viewers living in different parts of the country.
- Rural people who are below poverty line cannot afford to buy TV sets. For those people there are community TV sets in rural areas but this is not enough to motivate and to improve living conditions of rural population.
- Radio and TV programs have limited reach in rural areas. Hence, there is a need for broad coverage of programmes.

A good television program must attract viewers' attention and hold their attention by being-

- Relevant to the audience
- Understandable
- Believable
- Technically well made

Characteristics of an effective television program

1. **Good Design:** Purpose, objectives and message will be strong and clear throughout and will be based on thorough planning. There will be an effective balance of visual and aural presentation of the message so that the visuals are not used as decorative additions to the spoken message.

2. **Good Script:** A message should be presented in a format suited to the medium and attractive to the chosen audience. At all times, a script should acknowledge the importance of finding and maintaining a balance between message and the medium.

3. **Good Production:** The finished program should be good, well produced, adhering to all the rules of good presentation — both technically and artistically.

Script writing for a Television

A Script is a sequence of subject matter of pictures, description with narration. The script will be a guide map for the definite direction for shooting works, art work, audio and video recording. It is a guide for the next step of shooting.

Script-writing involves writing the complete video programme in a suitable form i.e., in visual terms. It also gives information about the duration of each shot or scene. This enables the working out of the total time for the programme and modifying the script, if necessary. The script will be a guide map for direction, art work, audio and video recording.

Script Writing is preparing a plan of action, everything needs to be written on a paper for the production team to work effectively.

While preparing a script various stages are involved. They are:

- Research.
- Treatment.
- Outline.
- Sequencing.
- Special effects and animation.

- Story board.
- Review.

Research

Collect all the facts on the topic on which the programme is being made, keeping the objective of the programme in mind.

The following steps are involved in Television Production Research

1. Select a subject matter based on the needs from the rural audience's point of view.
2. Choose an appropriate topic.
3. Determine the main points.
4. Get an overall picture in your mind.
5. Divide the programme into important steps and arrange them in logical order.
6. Consult experts to make the telecast more accurate.
7. Select a format or method of presentation (Demonstration/Dramatization etc.).
8. Determine the participants (farmers/home makers/specialists/folk artists etc.)
9. List down all the visuals, equipments and materials.
10. Make an outline of the programme (time, video, audio and background music).
11. Keep all the visuals, specimens and participants ready before going to record.
12. Rehearse the programme thoroughly in the office, field or any convenient place.
13. Time the rehearsal for each segment and sequence.
14. Arrive at the shooting venue well in advance.
15. Make any last minute changes, if necessary.
16. Try to get an informal approach to the programme.
17. Prepare a commentary to each sequence according to its importance.
18. Decide the time segment for each visual according to its importance.
19. Decide background music.

20. Finally prepare a script for video production in terms of pictures, time in seconds, commentary, video and audio, nature of shot, background music and moderator & experts

Treatment

It depends on the resources available. It may be a straight narrative with a documentary approach, with a voice-over commentary or a studio talk combined with visuals or a dramatized presentation. It is necessary to write the treatment of topics for a more detailed work and proceeding ahead.

Outline

Considering characteristics of the target audience, an outline of the programme is worked out in a rough way. An Outline should neither be so detailed nor very short. It should contain importance of the subject intended for clients

A Good Outline will State:

- Title of the Program
- Its aim and objective
- Approximate duration
- Sequence of events
- Two to three times treatment of subject in different ways for better organization and presentation of video program in an appropriate format.

Sequencing

It is done to make the video program coherent and also interesting. Attention is to be paid at sequencing stage to ensure that viewer is introduced to the subject and guided step by step towards the end. In any video program, the beginning and the end is very important. The beginning part must grab the attention and the end must come about naturally.

Special effects and animation

These are required to achieve a particular transition or convey an idea effectively. Special effects like 'dissolves', 'fade in' and 'fade out' are used to indicate the passage of time or start or conclude of a sequence.

Story board

After writing down the script in written form, a story board may be prepared wherein each shot is indicated by a drawing. This type of a story board will be very useful for other team members, as they can know what is included in a particular shot and work accordingly.

The following points have to be remembered while preparing a T.V script.

- Narrative portions (commentary, spoken text, dialogues) should be crisp and to the point.
- An essay like approach where a point is stretched in many words, should be avoided.
- Audio element is only to support the visual images and not vice- versa.
- Avoid use of words like 'as follows' 'etc.' 'foregoing' and other similar words in audio text / T.V script.

For ease of working a script may be divided into the following columns:

- Scene / Shot no.
- Type of shot (long / medium / close-up)
- Audio
- Video
- Duration

Preparing a story board:

- Develop a story
- Visualize situations
- Select pictures, sketches
- Arrange in sequence

- Prepare brief narration for pictures
- Allot time for each shot
- Select suitable exposure viz. close-up, long shot or medium shot depending on the importance of the picture.
- A story board can be prepared on plain paper / printed proforma.
- Write detailed blue print of the program.

Review

After complete writing of a script, it may be reviewed by a person other than the person who originally wrote the script. This will enable corrections and for further improvement. Recapitulation of the salient points at the end will make a program more effective.

1.5 MEDIA STRATEGY

The country needs substantial expansion in its existing communication facilities. At the same time, resources are limited. Also there are other high priorities. It is therefore, necessary to devise ways and means to utilize limited communication facilities to their fullest extent.

An intelligent and planned approach to the problem, harnessing of all available resources, Centre- State coordination, result-oriented strategy, innovations and non-governmental agencies etc. are some of the areas which deserve attention in the country.

There are a number of ways to use channels, such as combining different media, which also promote effective behavior change. Many of the media/channels (poster, flyer, video, folk theatre) when combined with inter-personal communication (IPC), can become more effective behavior change interventions. After the materials or a drama has been shown, a facilitator can lead an interactive session with the audience to reinforce the messages. These components of communication strategy should be linked with an on-going program activities. (e.g. episodes are shown on video, followed by workbooks and other interactive activities.)

Mass media can reinforce localized IPC activities. (e.g. nationally televised countdown before upcoming NID for polio eradication helps local volunteers going house to house to mobilize families on the day of the campaign.)

With its broad reach, mass media can promote positive social norms e.g. drama, serials and model educate farmers and women participating in agricultural operations; a documentary shows communities that they have overcome the technology gap; radio broadcasts testimonials of successfully using family planning methods. Folk theatre can dramatize sensitive issues that people are unwilling to discuss directly. After the program, beliefs and behaviors can safely come into public view and begin social change at the community level, during the interactive sessions. Broadcast media can broaden the reach of print materials to illiterate audiences.

A poster can be shown on TV, read aloud and commented upon. Folk theatre/songs can be used in areas where other channels cannot reach. Television will not reach areas with no electricity or where national language is not readily understood; in sparsely populated areas, home visits are not a cost effective ways to provide information, yet many people will easily gather to watch a performance on market days. For folk theatre to have maximum impact, local theatre groups, performers and singers can be selected and involved in the creation of scripts. This will ensure local context and use of appropriate language and dialect.

1.6 MEDIA SELECTION PROCESS

Mass communication services influence attitudes and behavior of people. People are persuaded and accept new values, attitudes and behavioral pattern. Mass media communications have been influencing individual organizations, communities and nations. Further, there have been positive and negative effects e.g.: yellow journal propaganda affect people negatively. Positive effects: social change, modernization, economic development. Folk media suited to a developing country helps in participation.

1.6.1. Process of Media Selection

It is critical to select channels which best match to the participants. Hence following points should be taken into consideration: Select channels that reflect the pattern of use of specific participant's group and the one that reach a group with the greatest degree of frequency, effectiveness and credibility. Channels which reach educated, resource rich farmers will be different from those that reach illiterate farmers. Understand that different channels play different roles (providing factual information, entertaining, etc.). Using several channels at the same time increases the impact of communication messages.

Select channels that are accessible and appropriate (e.g. radio messages should be scheduled at times when participants are actually listening; print materials should be distributed only to literate participants who are used to learning through written materials; pictorial materials can be distributed to illiterate participants; inter-personal communication should come from credible and respected sources).

Effectiveness of a channel should be measured by its ability to get people to remember information; to be motivated to tell other people about this information; and to change their behavior based on the information. A channel could also be considered effective if it provides timely information, creates a climate for change, efficiently reaches targeted group of people and is cost-effective.

There is no single extension teaching method which can be said to be the most effective. The best results can be achieved, when several methods are used in combination.

1.7 MEDIA MIX FOR RURAL COMMUNICATION

In addition to the personal contact method and face to face group teaching methods, mass media enable extension workers to greatly increase teaching efficiency. Ex: publications, radio, television etc. A combination of mass media and inter-personal communication channels is the most efficient way to reach people with new ideas and innovations.

Media forums are one of the mass contact method developed in Canada among farm families which later spread to less developed countries such as India, Nigeria and Brazil. Media forums are small group of individuals who meet regularly to receive mass media programs and discuss its contents. The mass media linked to the forum may be a radio, as in India forums are called Charcha Mandals or the Radiophonics school of Latin America. Media forums represent a combination of mass media with inter-personal channels.

Farmers who are exposed to mass media channels and then participate, seem to be generally effective in creating knowledge, changing attitude and in catalyzing behavior change. Neurath designed his field experiments so that comparisons could be made in knowledge increase among the peasants who lived in three types of Indian villages.

- Those in which radio forums were established
- Those in which radios were already present.
- Those which have neither radio nor a forum.

Radio forum villages had much greater gain in knowledge of innovations than did the control villages, followed by villages where radio was present. The effect of mass media channels especially among peasants in less developed countries, are greater when these media are coupled with inter-personal communication channels in media forums.

Television has a unique advantage over other mass media. Since it provides picture and sound effect, demonstrations are brought to farmers by farm television. Farmers also respond readily to what is said, especially by other farmers through inter-personal communication. Combination is doubly effective. Before a farmer thinks of taking action, he requires television information and impression to be reinforced by local demonstration and individual personal confirmation.

1.7.1. Factors to be considered in selection and combination of media:

There is no single "Rule of Thumb" for selection and use of media.

For effective results extension workers should:

1. Select appropriate method.
2. Have a suitable combination of the selected methods.
3. Use them in proper sequence.
4. The main factor is the audience - people may largely differ in matters of education, training, age, income level, social status, religious beliefs.
5. Some are progressively seeking changes. Others are slow to change.
6. Some are "Eye-minded "while others are "Ear-minded". Such individual and collective differences influence teaching approach.
7. Farmers with little schooling or education, may respond to personal visits and result demonstrations. Written published material must be in very simple language.
8. Farmers with better education and more advanced, will go to group meetings and discussion, method demonstration and written materials.

1.8 MODERN VERSUS TRADITIONAL/FOLK MEDIA

In India traditional media have a history of communication for religious purposes. They were also the change agents in cultural and social transformation in earlier times. In the history of freedom struggle also, songs, ballads, plays, folk-plays and a variety of programmes played valuable part. Sangeet Natak Academy was set up almost 27 years ago, by the Government of India to promote performing arts. It acted at the national level for the promotion and growth of Indian music, dance and drama; for maintenance of standards of training in the performing arts; for revival and preservation; documentation and dissemination of tribal and folk forms of music, dance and drama and for recognition and institution of awards to outstanding artists. It also coordinated the activities of State academics in the field of dance, drama and music.

The song and drama division utilized live entertainment media for creating an awareness among the masses in rural India. It was set up in 1954 as a cell of AIR. Today, it has become a major division under the Union Ministry of Information and Broadcasting. It presents live programs all over the country through its regional centers,

departmental troupes and registered private parties. The themes handled in these programs are viz., national integration, democratic values, developmental activities, prohibition, health, civic education, adult education and so on.

In a developing country like India, which is multi-lingual and diverse in character and where peasantry constitutes the largest segment of the population, knowledge of folk institutions, their habits, customs, traditions and culture serve as significant tools in the process of motivating rural masses towards development programs launched by the government at the national, State and local levels. Folk media are an important tool in the process of motivating rural masses towards accepting social changes that are being introduced through various development agencies.

1.8.1. Concept of Traditional Media: The term indigenous is often interchangeably used with terms like traditional or local. Indigenous communication system, which existed before the arrival of mass media are referred to as traditional or local. Terms related to traditional media are operationally defined as follows:

Folk: All persons residing within a given area who are conscious of common culture, heritage, have some constant traits, whose way of life is more simple, natural, less systematic and specialized in a modern sense.

Traditional Media: The non-electronic medium which works as part of our culture and as vehicles of transmitting tradition from one generation to another is called traditional media. People based on their religion and language have their own culture comprising specified customs, festivals and ceremonies with different ways of communicating known as traditional/folk media.

Traditional media are indigenous channels of communication having an in-built character of entertainment, which were made for expressing socio-ritual, moral and emotional need of the folk such as folk songs, folk arts, folklore etc. They are alive, receptive to new ideas including changes over the time and generations and colorful forms of presentation. The familiar format and content expressed in colloquial dialects

creates a successful communication situation in which, there is constant sharing and two way flow of communication involving everybody in the communication process.

Folk Media: are the traditional media based on sound, image and sign language. These exist in the form of traditional music, drama, dance and puppetry, with unique features in every society, race and region. Folk media are the traditional media of a particular community or nation used since time immemorial for communication and sharing joys and concerns. Different religious and linguistic groups have different folk media.

1.8.2. Characteristics of Traditional/ Folk Media

a. Indigenous in nature, generally rural in origin, transmitted from generation to generation through oral means alone.
b. No source of confirming the authenticity of folk art. It has no grammar.
c. Indicates and integrates emotional behavior of the practicing section.
d. Represents practicing section of region, religion, family or group that can be differentiated from the other.
e. Limited area of operation.
f. As long as the contents and formats satisfy psychological and social needs of the people, they will be carried forward by the people themselves. Hence the traditional media communication can put fresh content in folk media.
g. Folk media will never die but continue in spite of several obstacles in modern age. Its utilization has widened its impact even across cultural regions with blended forms and modified contents.
h. Traditional folk media have their own specific language, rhythm, music, style and form.
i. Their appeal is at personal level.
j. Its impact is much deeper.
k. Very useful for community development.
l. Easily available for all age groups.
m. These media are comparatively cheaper.

n. They belong to the community.

o. Acceptability level is high.

p. Entertainment.

q. It is very cheap, easy and convincing compared to modern media

1.8.3. Formats of Traditional Media

Tamasha: Tamasha has been the folk theatre and popular entertainment of Maharashtra. It is extremely lively. It has a female artist who sings favorite songs of the patrons.

Bhajan: The literal meaning of Bhajan is a religious song. This folk art is generally performed on religious functions especially during Diwali. It consists of six or seven performers. One of them is the main singer and the rest his associates.

Puppetry: Puppetry is the art of designing, constructing and operating puppets. It is a distinct form of folk medium. It is a dramatic expression with the help of little creatures called puppets, having varying degrees of movement. It is mostly considered a play activity.

Kirtan: It is one of the oldest forms of Indian mass media Ancient sage Narada is believed to be its founder and foremost exponent. It is a traditional form in which there is continuous flow of discourse of religious nature.

Dhandhar: The literal meaning of Dhandhar is a big confused group. This form is a combination of storytelling and songs. It is also known as ballad (a folk art of Maharashtra), which includes some kind of acting, dance and drama along with the rhythm of musical instruments.

Qawwali: This folk art is a favorite among Muslim community. It is performed at the time of their social or religious functions. The themes of the songs are related to the social situation or prayers.

Burra Katha: Burra Katha is a Telugu art of storytelling. Burra Katha is a form of storytelling with the help of drumming instruments and chime and includes a group that

comprises a minimum of three minstrels (one main performer and two co-performers) who are specifically trained in family tradition.

1.8.4. Difference between Traditional and Modern media

Traditional media	Modern media
Non-electronic in nature	Technological in nature
Flexible in nature but culturally rigid	Flexible but enjoys cultural freedom
Less expensive medium	Expensive medium which needs high monetary investment
Messages are presented before a live audience	Messages are transmitted or broadcast
Reach is limited	Reaches out to a large number of people
Homogenous audience	Heterogeneous audience
Assimilated with social and cultural functions	Difficult to assimilate in the society
Communicates through vocal, verbal, musical, visual folk forms	Communication through electronic and print media
Oral transmission from generation to generation	Diversified means
Indigenously developed with experience but without grammar	Modern modes developed scientifically through experiments
Usually for illiterates	Usually for literates
Low cost channels	Very high cost media
More credibility	Less credibility
Limited applicability but more acceptance	Wide applicability but less acceptance
Instant feed back	Delayed feed back

Table 1.1 Difference between Traditional and Modern media

1.8.5. Integration of Modern Media and Traditional Media

Under the impact of the more sophisticated, more glamorous and more powerful electronic media, folk art forms cannot be transformed. An integrated approach will strengthen the efficacy of both; technology-based and traditional media. A perfect combination of the modern and the traditional would make for a practical approach, though it must be seen that the folk forms are not crushed in an unequal competition with the new media.

Almost all Government officials opined that traditional media programs are effective and has good impact on rural masses compared to the other media. It is successful mainly because the artists could get direct feedback due to the performances being live and in local language that help develop closeness. According to the officials, blending of the traditional media with mass media would be more effective in rural areas as people in villages can identify themselves better with the traditional folk forms.

If we want to use traditional media as a communication tool, it is essential to consider some points viz., selection of the folk media on the basis of popularity among concerned folk artists, who are well acquainted with local language, dialects, culture and traditions; organize at village place with the help of interested village people, systematically following all the steps and themes related to social development, patriotic as well as recreational and entertainment and suitability of the media . Thus, utilization of locally available resources viz. talent of the folk artists, popularity of the media, agri. proverbs, acceptable idioms, riddles etc., through traditional media are found to be very interesting and effective as a communication tool for rural development and natural recourse technology.

It is therefore, concluded that the potential of traditional media can be utilized wisely and systematically for agricultural as well as rural development. They can serve

the society as an indigenous tool of inter-personal, inter-group and inter-village communication for ages.

1.8.6 Implications

A combination of various traditional media and modern media can be used and studied for determination of effectiveness for technology transfer and rural mass communication for development. When folk media is integrated with electronic media, the new mode takes over certain functions of the existing mode, but the basic functions are retained because of its local acceptance and association with social systems. A working document prepared for a group of experts in London mentions that a wise strategy would try to bring about a mutual reinforcement of the advantages of both the traditional and the modern media. It would also see that the effectiveness of traditional forms do not vanish because of their inability to face up to the competition of mass media, and that these media do not lose their impact as soon as the novelty of their use wore out.

1.9 CONCLUSION

New communication technologies are enabling speedy and low cost transmission of information. Print and electronic media play vital role in communication. Traditional or folk media are also being used. A combination of traditional and modern media can be used for effective technology transfer and communication for development. It is also critical to select the channels which best match participant's needs.

1.10 LET'S SUM UP

A wide range of electronic communication technology which can bring about improvement in information transmission is now available. The task of creating and encouraging attitudes and providing adequate information is being increasingly entrusted to the mass media. It is critical to select the channels which best match participant's needs. Using several channels at the same time increases the impact of communication messages.

Select channels that are accessible and appropriate to the audience. Effectiveness of a channel should be measured by its ability to get people to remember information; to be motivated to tell other people about this information and to change their behavior based on the information. A channel could also be considered effective if it provides timely information, creates a climate for change, efficiently reaches the targeted group of people and is cost-effective.

A combination of mass media and inter-personal communication channels is the most efficient way to reach people with new ideas and innovations. A combination of various traditional media with modern media can be used and studied for determination of effectiveness for technology transfer and rural mass communication for development.

1.11 CHECK YOUR PROGRESS

1. Illustrate various types of channels in media?
2. What is Mass media? Explain its role in the dissemination of farm technology?
3. What is communication media? Explain in detail about various types of communication media with illustration?
4. What type of media strategy has to be followed for effective dissemination of farm technology?
5. What are the major differences between a traditional and a modern media, cite suitable with examples?

1.12 FURTHER READINGS:

1. Basu, D.D. (1996). Laws of the Press, *Princeton Hall Publishers*, New Delhi.
2. Herbert Lee Williams. (1978). Newspaper Organization & Management, *Surjeet Publications,* New Delhi.
3. Sadanandan, K. (2001). Perspectives on Development Communication: Sage Publications, New Delhi.
4. Uma Narula, (1999). Development Communication. *Har Anand Publications Pvt. Ltd.*, New Delhi.
5. Virbala. (2002). Handbook of Journalism & Mass Comm., Concept Publications. Co., New Delhi.

UNIT-2

COMMUNITY RADIO AND ITS OPERATIONALIZATION

Highlights of the Unit

- Objectives
- Introduction
- Community Radio - Meaning and Importance
- Operationalization of Community Radio
- Community Radio Initiatives
- Conclusion
- Let's Sum up
- Check Your Progress
- Further Readings

2.0 OBJECTIVES

- To orient the learners with the conceptual understanding and importance of community radio in dissemination of farm technologies.
- To familiarize the learners with the operation of a community radio station.

2.1 INTRODUCTION

Radio is one of the oldest media access points for information seekers. Farmers tune in to radio for information on weather forecast, market prices and pests & diseases. Radio has been found to be an effective medium of communication, with a potential to reach a wider audience than any other medium. It can cut across geographic, cultural and literacy barriers and it has ease of accessibility and cost-effectiveness. Despite rapid technological changes in telecommunications in the last few decades, radio broadcasting remains the cheapest mode of information dissemination, equally catering to the needs of the rich and the poor, the rural and the urban masses and reaching the remotest parts of the country.

Needless to say, it plays a vital role in the country's socio-economic and cultural development.

All India Radio (AIR) has experimented many programs for rural people. One such is Radio Rural Forums with a theme "listen, discuss and act". A forum of 20 persons meet once or twice in a week. They first discuss issues related to cultivation aspects for twenty minutes and in the remaining time they get answers for their questions. Questions raised in the program are answered in the last ten minutes of the next program. The success it received was beyond expectations. Encouraged with many such forums i.e., 7,500 forums were started in the country till 1960s. Later it lost its identity as transistors became cheap, a shift from group to individual listening took place. In early 1970s some stations in southern India started "Farm School on AIR" which consisted of a complete course on subjects of relevance to farmers in different episodes with the successful experience at Bangalore AIR station in 1978.

Government of India established Farm & Home units in AIR in 1965 to communicate specifically on agriculture and related technical information. Programs of F & H unit include talks, discussions and interviews with successful farmers, school on AIR and agricultural bulletins, etc.

However, despite its cost effectiveness and wider reach, radio continued to be a technology, which has not been fully utilized. The reason could be that it often does not fully address local needs or concerns. This led to the emergence of the concept of community radio, often known as the third tier of broadcasting, after national and regional radio.

In December 2002, the Government of India announced a policy for granting community radio license to well established educational and management institutes. On 16 November 2006, the Government of India notified a new Community Radio Policy which permitted NGOs and other civil society organizations to own and operate community radio stations.

Among the various modes of radio broadcasting, community radio especially has an important role to play. Due to its focus on local concerns and aspirations and the interactive nature of its program, community radio can be a powerful medium for education and development. The experience of a number of developing countries in using community radio for such purposes has clearly demonstrated its tremendous potential for strengthening development support for the farming community.

This module will help in understanding the concept of community radio, different initiatives in the country and motivate communities for having a community radio. You will be able to assist the communities in identifying needs, selecting topics, programs production and feedback assessment in community radio programs.

2.2 COMMUNITY RADIO-MEANING AND IMPORTANCE

2.2.1 Types of Radio

Radio stations can be categorized into three types:

Public radio: owned and operated by the Government. Its main purpose is generally to serve the public in a way that the Government thinks as the best.

Private radio: owned and operated by individuals or companies. They have to generate finance for running the radio.

Community radio: This is radio owned and operated by members of a community. Community radio is a broadcasting organization established to provide communication support for the social, economic and cultural development of a community within a geographical location and owned and operated by the community on a non-profit basis.

2.2.2 Concept of Community & Community Radio

Origin of the word 'Community' lies in having 'something in common', something that not only refer to geographical concepts like neighborhood, village, town etc. but also to other social determinants such as ethnicity, religion, gender, etc. Thus two forms of community- geographical community and community of interest - can be identified.

When used in common parlance, 'community' means a body of people with some common interests.

Community radio is a low-power broadcast station that broadcasts community and development oriented programs and is basically meant to satisfy the needs of the community it serves. Community radio is also known by other names like local radio, farm radio or co-operative radio.

In "What is Community Radio? A Resource Guide" World Association of Community Radio Broadcasters – AMARC/Africa and Panos/Southern Africa described the philosophy underlying community radio: "The historical philosophy of a community radio is to use this medium as voice of the voiceless, mouthpiece of the oppressed people (be it on racial, gender or class grounds) and generally as a tool for development. Community radio has three components: non-profit making, community ownership & control, and community participation. It should be made clear that community radio is not about doing something for the community but about the community doing something for itself, i.e., owning and controlling its own means of communication (AMARC and Panos, 1998).

AMARC further defines community radio as "a not-for-profit radio which serves the community in which it is located or to whom it is addressed, all the while encouraging expression and participation of the community in the station.

Community radio is owned and managed by a community. It is the community members who participate in planning, production and dissemination of content. This makes it an ideal platform for generating and delivering information suited to the educational, developmental and cultural needs of the community it serves.

The power of a community radio lies in its participatory nature, as it is community oriented where the community members themselves raise issues, voice their concerns and identify their own priorities. Emphasis is on local issues and concerns. It is an interactive platform, where a community not only receives information but also generates content.

2.2.3 Community Radio - Importance in Rural community

In view of the unique features of a Community Radio, it can be a good medium for generating awareness, information exchange at the community level and can play a role in catalyzing development work. Community radio stations are expected to produce at least 50% of their programs locally, as far as possible in the local language or dialect. Information could be related to agriculture, horticulture, water resource management, animal husbandry, weather, market information; health, education, government schemes etc.

2.2.4 Characteristics of Community Radio

Following are the characteristics of community radio:

- It serves a recognizable community.
- It encourages participatory democracy.
- It offers an opportunity to any member of the community to initiate communication and participate in program making, management and ownership of the station.
- It uses technology appropriate to economic capability of the people, and not that which leads to dependence on external sources.
- It is motivated by community well-being, not commercial considerations.
- It promotes and improves problem solving.

2.3 OPERATIONALIZATION OF COMMUNITY RADIO

2.3.1 A radio station has basically three components:

- Studio for live broadcasts or recording program for later broadcasts.
- Transmitter, to convert the speech into a high frequency signal for transmission and
- Tower with antenna. An antenna mounted on a high pole or a tower is used to send signals in large areas. In case of FM broadcasts, allowed for Community Radio Station (CRS), the signal travels in the line-of-sight. As such, a higher antenna has the advantage of higher coverage.

2.3.2 The stake holders include

Community members-They are audience and the people who are central to the project.

Providers of technology - These people provide equipment that the project will need; train members of the community on how to use and maintain the equipment.

Government - There are two levels in the Government that need to be kept in focus:

i. The department which will grant permission for the program either through AIR channels or through ownership of radio transmitters.
ii. The local administrative authorities.

Producers and staff - These are the people who know the techniques of program production and will help community to generate ideas and create programs.

They will also help with inputs from outside sources that would add to the general information pool, essential to sustain radio programs

Resource mobilisers - These are the people who provide finance to support the initiative. These could be the State, corporate house or NGO but the ultimate sustainability must come from within the community.

2.3.3 Setting up a Community Radio

Recognizing the potential of a community radio for communication, in 2002 the Government of India, opened access to community radio, to well-established educational institutions recognized by the Central or the State Governments, including Universities and institutes of technology/management and residential schools.

In 2006, the Government broad based the policy by bringing 'Non-profit' organizations like civil society and voluntary organizations etc. under its ambit, in order to allow greater participation by the civil society. The organizations which are eligible to apply for Community Radio license include Community based organizations, including civil society and voluntary organizations, State Agricultural Universities (SAUs), ICAR institutions, Krishi Vigyan Kendras, Registered Societies, Autonomous Bodies and Public

Trusts registered under Societies Act or any other such act, with registration at the time of application, being at least three years old educational institutions.

As per the new guidelines, for obtaining the license, eligible organizations and educational institutions can apply in a prescribed application form (which can be downloaded from the Ministry of Information and Broadcasting website www.mib.nic.in) along with a processing fee. Applications from universities, deemed universities and Government run educational institutions are put up before an inter-ministerial committee chaired by Secretary (I&B) for approval. Once the Wireless Planning and Coordination (WPC) Wing of the Ministry of Communication & IT earmarks a frequency at the place requested by the institution, a Letter of Intent (LOI) is issued. In case of other applicants, including private educational institutions, LOI would be issued subject to receiving clearance from Ministries of Home Affairs, Defense & HRD (in case of private educational institutions) and frequency allocation by WPC wing of Ministry of Communication & IT.

On clearance by the Ministry concerned and within one month of the issue of the Letter of Intent (LOI) , eligible applicant has to apply, in the prescribed format and with the requisite fee, to the WPC Wing of the Ministry of Communication & IT, Sanchar Bhawan, New Delhi for frequency allocation & SACFA clearance. A time frame of six months from the date of application is prescribed for issue of SACFA clearance. On receipt of SACFA clearance, the LOI holder may furnish a bank guarantee for Rs.25,000/- and sign a Grant of Permission Agreement (GoPA) by Ministry of I&B, which will enable him to seek Wireless Operating License (WOL) from the WPC Wing of the Ministry of Communication & IT. The Community Radio Station can be made operational after the receipt of WOL from the Ministry of Communication & IT. Within three months of receipt of all clearances i.e. signing of GoPA, the Permission Holder may set up Community Radio Station and intimate the date of commissioning of the Community Radio Station to the Ministry of I&B.

The Grant of Permission Agreement period is for five years and this agreement and the permission letter are non-transferable. The spectrum usage fee has to be paid by the Permission Holder to WPC wing of Ministry of Communication & IT. (MIB, 2008).

2.3.4 Content

The Guidelines stipulate that the programs should be of relevance to the community and reflect their interest and needs. Emphasis should be on developmental, agricultural, health, educational, environmental, social welfare, community development and cultural programs. At least 50% of the content should be generated with the participation of the local community, for which the station has been set up. Programs should preferably be in the local language and dialects. All programs broadcast by the CRS must be preserved for three months from the date of broadcast. Programs relating to news and current affairs and are otherwise political in nature, should not be broadcast. The Permission Holder has to ensure that nothing is included in the program broadcast which: offends against good taste or decency; contains criticism of friendly countries, attack on religions or communities or anything defamatory, false and half-truths; or likely to encourage or incite violence, encourages superstition or blind belief; denigrates women and children etc. (MIB, 2008).

2.3.5 Transmitter Power and Range

CRS is expected to cover a range of 5-10 km. For this, a transmitter having maximum Effective Radiated Power (ERP) of 100 W would be adequate. However, in case where an organization needs to serve a larger area, higher transmitter wattage could be considered, subject to availability of frequency and necessary clearances. A maximum antenna height of 30 meters is allowed. Universities, Deemed Universities and other educational institutions are permitted to locate their transmitters and antennae within their main campus, while for NGOs and others, the transmitter and antenna shall be located within the geographical area of the community they seek to serve.

Transmission of sponsored programs is not permitted except programmes sponsored by Central & State Governments and other organizations for broadcasting public interest information. Limited advertising and announcements relating to local events, local businesses & services and employment opportunities are allowed, with maximum duration restricted to 5 minutes per hour of broadcast.

The guidelines issued by the Government of India defines the core objective of community radio, in terms of serving the community's cause in the service area of the licensee by involving community members in the broadcast programs. Community would mean people living in the coverage zone of the broadcasting service of the licensee. The guideline recommends that all the program broadcast should be 'free to air (broadcast)' basis. In other words, licensee cannot make profit by way of charging for broadcasting programs.

It is community driven in the sense that the programs are made considering local needs of the people, and are made by few of the community members who are trained in audio production and operating the audio and broadcast equipment. Thus the important factors are: the content should meet local needs and it should involve community members in development of the programs.

2.3.6 Type of Programs

As per the guidelines by the government, development programs on agriculture, education, environment and health can be broadcast. Entertainment programs confined to social, cultural and local issues in the local dialect can also be broadcast.

There are a number of formats, which can be used to disseminate a message viz., a documentary, song, quiz, drama, panel discussion, talks, lectures, dialogue, interviews, phone-in programs or other creative format.

The ideal time for the broadcast and the program schedule can be determined through a listener's survey, to know the best time for broadcasting a particular program and finding out by broadcasting at different times of the day. The programs may need to be

distributed over 3-4 slots, the program and time slot depends on the accessibility by a particular audience group to whom it is targeted.

2.4 COMMUNITY RADIO INITIATIVES

There are a number of initiatives in India and other countries which demonstrate potential of community radio.

In Philippines, Indonesia, Africa, Latin and South America, community radio is an important medium that imparts education, communicates information relating to health, helps identify and solve local problems and promotes local culture. Community Radio Station in Kothmale, Sri Lanka, helps villagers to get access to information superhighway. The Kothmale community radio in Sri Lanka is one of the first projects aiming at convergence between radio and internet. The project uses community radio as an interface between internet and rural communities. The station receives requests for information from the audience, searches web for appropriate data and returns results to the listeners, in the local language. It is also building a database with information useful to the local constituency.

2.4.1 Community Radio initiatives in India

The Letters of Intent (LoI) have been issued against the new guidelines to a number of institutions in India including agricultural universities, research institutions, KVKs and NGOs. Some of these include Narendra Dev University of Agriculture & Technology, Faizabad, Uttar Pradesh, GB Pant University of Agriculture & Technology, Pant Nagar, Uttarakhand, Birsa Agricultural University, Ranchi, Jharkhand, Allahabad Agricultural Institute Deemed University, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhatisgarh, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, CSKHP Krishi Vishwavidyalaya, Palampur, Himachal Pradesh, CCS Haryana Agricultural University, Hissar. Research institutions include Indian Veterinary Research Institute, Izatnagar, Bareilly, Uttar Pradesh, KVKs in Washim, Bidar, Faridkot, Ahmednagar, Reddipally, Pauri, Chamoli, Tehri Garhwal Chiniyalisaur, Jyolikot, Lohaghat,

Rudraprayag, Udham Singh Nagar, Dehradun,, Haridwar, almora NGOs - Deccan Development Society, Hydrabad, Andhra Pradesh, Alternative for India Development, Chennai, Tamil Nadu, Society for Development Alternatives, New Delhi, Indian Society of Agribusiness Professionals, New Delhi etc.

The Pastapur initiative of the Deccan Development Society of Andhra Pradesh is managed entirely by women. The Kutch Mahila Vikas Sangathan is an initiative in Bhuj, Gujarat that uses medium-wave broadcast channel of AIR. Alternative for India Development, Bihar, which has a radio initiative in Daltonganj, Palamau District of Jharkhand, uses purchased air-time from a local AIR channel. "Namma Dhwani", is an initiative by VOICES and Myrada in Budikote, Karnataka. Other initiatives include Charkha's "Pechuwali Man Ke Swar" in Ranchi, SEWA's 'Rudi no Radio' in Gujarat and Agragamee's 'Ujjala' in Jeypore, Orissa. "Radio Alakal" is a community radio for fisher folk in Kerala**.** Apart from weather forecast, tidal height, conditions at sea and disaster warning, the programme content includes discussions and expert opinions on livelihood options, market information and interviews. Pantnagar's Janvani is a community radio run by GB Pant University of Agriculture and Technology. In Uttarakhand, Raibar community radio and "Hewal vani" Community Radio are some of the groups working actively in the region. These community radio programs are providing information on issues related to employment, education etc. and are helping in spread of information from one village to another in the hills. "Chala Ho Gaon Mein" is community radio program in Jharkhand launched in 2001. The program is reaching out to remote, backward and inaccessible regions of Jharkhand.

Some of these initiatives are briefly profiled here.

2.4.1.1.1 Namma Dhwani – Karnataka

In Budikote a village 100 km from Bangalore, on the Karnataka and Andhra Pradesh border, Namma Dhwani is India's first cable community radio station. It is the result of a partnership between the rural community in Boodikote; MYRADA, an NGO; VOICES, a development-oriented communication organization and UNESCO. The infrastructure

was provided by MYRADA, technical expertise from VOICES and the funding from UNESCO. Representatives of Self Help Groups form Namma Dhwani Management Committee (NDMC) and are the chief planners and implementers of the service; and coordination is by staff from MYRADA and VOICES.

Community radio was perceived as a source for timely and useful local information and for sharing their experiences and problems with other community members. The community used their radio station to complain about non-functioning water services and the problem was addressed by the authorities. It has benefited individual villagers as well. Programmes have been made on a variety of topics including sericulture, organic farming and health. It not only improved the knowledge base but also involved the members more closely in the development of their community.

In order to reach the local community, community radio staff started narrow casting at Self Help Group meetings. Resource people were drawn from the community to talk about selected topics and interviews were recorded on tape. Programmes were played at community meetings, in schools, at youth groups, during training programmes and at the local market. The network was extended to 60 Self Help Groups consisting mainly of women from poor families, who had little access to information, in 35 villages around Boodikote. This became a group activity, providing ample scope for discussion. In 2002, Namma Dhwani made an agreement with the local cable operator for using cable network to transmit programmes, reaching out to more families. (LEISA, 2004).

2.4.1.2. Pastapur Community Media Centre in Zaheerabad, Medak district

Deccan Development Society (DDS) established a community radio station in Pastapur, Zaheerabad, in Medak district, 100 kilometres south of Hyderabad, facilitated by UNESCO. DDS is a grassroot organization working with Sangams (village level groups) of poor women. Women's organizations are involved in managing and production of programmes for this radio station.

The radio station covers a 35 km radius. Owners and audience are women's groups (sangams) in 75 villages of Medak district. Prior to the license being obtained, they resorted to narrow casting. Programmes were recorded and the cassettes sent to women's groups where the members listened to the messages in weekly meetings. The initiative is managed by women who record programmes by interviewing local experts, editing and making the content ready for broadcasting.

The station has a 100 watts transmitter, which can reach a radius of 30 kms. The programme content seeks to meet information, education and cultural needs of the region. Programmes relate to information specific to agricultural needs of semi-arid regions, education and literacy, health and hygiene, environmental issues, food security, indigenous knowledge systems, issues related to women empowerment local cultures, with emphasis on the narrative traditions of song and drama.

The content includes agricultural practices, animal husbandry, horticulture, medicinal plants, seed preservation systems and methods, government schemes, revival of customs and traditions. Format is both spoken and musical: interviews in the studio or on the field with local experts, discussions (in the form of questions and answers), plays, storytelling, *burra kathas, rela patalu* (agricultural practices). (DDS, 2008).

2.4.1.3. Chala Ho Goan Mein

Community radio program 'Chala Ho Gaon Mein' was initiated by Alternative for India Development in the regions of Palamau, Garhwa and Latehar districts of Jharkhand.

This is a weekly community radio program aired on AIR – Daltonganj in Palamau district of Jharkhand. Two local NGOs - Alternatives for India Development (AID) and Manthan Yuva Sangathan- joined hands to launch Chala Ho Gaon Mein, a half an hour community broadcast through All India Radio. An NGO, AID and journalists lend technical support to the programme Manthan. The National Foundation for India (NFI), strategically and financially backs the initiative. Every Sunday at 7.20 p.m. AIR Daltonganj broadcasts the sponsored program Chala Ho Goan Mein (30 min.). The local

dialect of Magahi is used in the program to the maximum extent. A range of issues of local importance are broadcasted every week which has brought in value addition. The villagers are involved in designing and devising the concepts and themes for the program.

The program includes a mixture of drama, songs, discussions and interviews on different issues. Interviews with doctors on seasonal diseases and the precautions to be followed are aired time to time. An attempt has also been made to increase the no. of listeners by providing FM radio sets to the Women SHG's, remote villages where radio sets are not available and also to the Gram Sabhas. In one village a Radio listener club has been established. The programme has highlighted some cases where the combined efforts of the community have brought about certain changes useful for the entire community, inspiring other villagers to fight for their rights.

Program development, message gathering & analysis and pre-editing listening session are carried out every month during a creative workshop. The content is decided after equal participation of all. Villagers from this area are participating in a community initiative and are getting to hear their own voices on the radio. (Alternative for India Development, 2008).

2.4.1.4. Radio Kotagiri

This is an initiative by Keystone Foundation in Niligiri. Their programmes - Namma Vivasayam & Arindhu Kolvom (Livelihood and Agriculture) focus on the importance of organic agriculture and different ways in which it benefits farmers, soil and the environment. The main objective of the programme is to spread awareness on organic farming and to help such people willing to convert their land for greater benefits. The uniqueness of the programme is impact of organic farming on farmers and the change it has brought in their life. Radio Kotagiri is a well-functioning community radio station that is managed by members of the indigenous community at all levels from content

creation to production and broadcasting, and day to day running of the Radio Station. (ActionAid, 2017).

2.4.1.5. Krishi Community Radio

This initiative by University of Agricultural Sciences, Dharwad in Karnataka covers a range of 15 km, covering 75 villages with population of 2.5 to 3 lakhs. The Krishi Community Radio Station provides information to educate farmers in rearing and management of their livestock through "Varada Basanna" programme. Basanna means a messenger who collects information from University of Agricultural Sciences, Dharwad, about protection of animals, health coverage and management of livestock. The programmes are produced by collecting farmers' problems and nurturing local talents. The Krishi Community Radio broadcasts special programme in local colloquial language (Kannada) in order to reach the farmers and educate them effectively on various issues. The main occupation of the farmers is agriculture and livestock management as they own a number of diary animals, sheep, goat, poultry etc. They need constant advice on animal husbandry and veterinary diseases. Community leaders, school teachers, elderly farmers, progressive farmers and people of the village take active part in dialogue, drama or discussion with Basanna, the host character who passes messages to the farmers and the farm women. The programme is helping the farmers take care of their animals without frequently visiting veterinary hospital at UAS, Dharwad. The programme also informs farmers on the new technologies developed by the University for the benefit of the farmers. (ActionAid, 2017).

2.4.2 Lessons from CR experiences- Impact of Community radio

As can be seen from some of the initiatives which have been described, a key aspect of community radio is in terms of giving voice to the poor and the marginalized, particularly women. There is an increasing evidence of its impact in poverty reduction, addressing development objectives and in building democracy. By giving voice to the marginalized, access to information and knowledge seems to be an appropriate tool to facilitate sustainable development.

Community radio has been seen to be effective in facilitating communication for development sectors such as health, education and livelihoods.

As some of the initiatives reveal, community radio has empowered women to actively participate in their communities.

2.4.3 Challenges

Sourcing location specific content is a challenge. Content can be sourced from agricultural research, extension, training, marketing organizations. Here linkages between local groups and institutions would help in knowledge sharing and exchange.

Sustaining participation of the community is another challenge. To involve people, the idea of CRs can be introduced in social gatherings, meetings, success stories and case studies can be shared to generate interest. There is a need for capacity building of community members in managing and handling the equipments and also in generating content which is needed at the local level.

2.5 CONCLUSION

This module shows how radio is an effective medium of communication, with a potential to reach a wider audience than any other medium. In addition to public and private radio, community radio is a radio which is owned and operated by members of a community, on a non-profit basis. Community radio provides communication support for social, economic and cultural development of a community within a geographical location. Due to its focus on local concerns and the interactive nature of its programs, community radio has potential for strengthening development support for the farming community. The community members themselves voice their local issues and concerns and identify their own priorities. Initiatives in India and other countries demonstrate power of community radio and how it enables rural population voice their concerns.

2.6 LET'S SUM UP

Community radio is a low-power broadcast station that broadcasts community and development oriented programs and is basically meant to satisfy needs of the community it serves. It is aimed at creating a platform through which community members could voice their concerns and raise issues. Involving the community in generating content, helps articulate and reflect local needs and generate demand for solutions and thus meet the needs of local communities.

Keeping in view the literacy barrier and the coverage area and content scope, community radio seems to be an appropriate tool for social development by giving a voice to those marginalized and bridge the digital divide.

2.7 CHECK YOUR PROGRESS

1. What are the types of Radio?
2. Mention some Community Radio initiatives in India.

2.8 FURTHER READINGS:

1. ActionAid (2017). Community radio for Change. http://communityradio.in/pdf/Community-Radio-for-CHANGE-A-Booklet-to-capture-the-best-practices-success-stories-including-the-learning-and-experiences-of-the-Community-Radio-stat.pdf
2. **All India Radio (2008):** http://allindiaradio.org/about1.html. Last accessed on 28 July 2008
3. **AID (2008):** Alternative for India development. At www.delind.ec.europa.eu/en/ *dev/ tribal_ sem/ alternative_ for_ india_ development. pdf Last* accessed on 15 January 2008.
4. **AMARC (1991):** "Participatory Communication, Community Radio and Development", seminar organized by the World Association of Community Radio Broadcasters (AMARC) in Montreal in April 11-12, 1991.
5. **AMARC/Africa and Panos/Southern Africa (1998**): "What is Community Radio? A Resource Guide." AMARC.

6. **Deccan Development Society (2007):** Women speak to women: DDS Community FM Radio. Last Accessed at www.ddsindia.com on 20 July 2008. Deccan Development Society, Hyderabad

7. **Govt. of India (2007):** Recommendations of Working Group on Agricultural Extension for Formulation of Eleventh Five-Year Plan (2007-12), 12th January, 2007. Working Group on Agricultural Extension Constituted by Planning Commission, Govt. of India.

8. **Govt. of India (2006):** Ministry of Information and Broadcasting (MIB). Policy Guidelines for setting up Community Radio Stations in India 4/12/2006. Last accessed at http://mib.nic.in/CRS /CRBGUIDELINES041206.pdf on 26 July 2008.

9. **LEISA (2004):** Namma Dwani: Our voices. LEISA Magazine, June 2004.

BLOCK IV: MEDIA IN COMMUNICATION

UNIT-1

MODERN COMMUNICATION MEDIA

Highlights of the Unit

- Objectives
- Modern communication media, transformation from radio to mobile and importance
- Computer aided instruction and e-learning in agriculture education (including e-krishi siksha)
- Scope of communication media in different formats for agricultural education – formal, vocational, skill building
- Role of mass media in dissemination of farm technology
- Role of social media
- Let's Sum up
- Check Your Progress
- Further Readings/references

1.0 OBJECTIVES

- To orient the learners about importance of communication in digital era
- To familiarize the learners about evolution of communication media
- To develop an overview of modern communication media

1.1 INTRODUCTION TO MODERN COMMUNICATION MEDIA

Communication is the mode of transfer of information from one person to another or one system to another through an established mode. A 'channel, or a 'medium, is essential for communication. It is a vehicle that takes our message to others and brings their response to us. Though there have been age-old instances of communication through modes like Palmyra leaves, wooden slabs or plates, stones, metal etc., technology has redefined the way communication is looked at. In addition to written communication, other modes like audio-visual means have gained importance and acceptability.

Introduction of information technology has changed these modes into digital format; and sophistication and internet has brought in the openness and sharing culture with the help of modes like social media.

1.1.1 Types of Communication Media

There are many types of communication media namely print media, electronic media, new media and social media as below:

- **Print media:** Books, magazines, newspapers and other texted documents
- **Electronic media:** Mobile, radio, telephone, television, audio and video records
- **New Media**: Online and digital means of producing, transmitting and receiving messages are called new media

  Six different types of **social media:** collaborative projects (e.g. Wikipedia), blogs and microblogs (e.g. Twitter), content communities (e.g. YouTube), social networking sites (e.g. Facebook), virtual game worlds (e.g. World of Warcraft) and virtual social worlds (e.g. Second Life).

1.2 TRANSFORMATION OF COMMUNICATION MEDIA (FROM RADIO TO MOBILE)

Methods of media and communication have come a long way from the period of telegram and radio to the present electronic age. In the 19th century, people used to read newspapers, listen music on radios and watch television and they used to communicate through telegrams but now people are communicating in cyber space. There is revolution in every nook and corner of the world- The Media revolution. Research in the field of media and communication has increased. Potential of sharing information across the globe has been dramatically increased with new electronic and social media. Internet has expanded its coverage and contributing in every aspect of life. The usage of smart phones and personal computers has increased tremendously and millions of people are using social media such as Facebook, Twitter, Instagram, YouTube, etc., for information sharing

in the form of text messages, photos, videos etc. Modern communication media has given a solution to increase the demand in access, accountability and efficiency.

Table 1.1 Technological Advances in Communication Media in Chronological order

Year	Events
1842	Telegraph was invented by Samuel Morse
1920s	First radio station was set up in Pittsburg, New York and Chicago
January 23, 1926	John Logie Baird of Scotland gave the world's first public demonstration of a mechanical television apparatus to the members of the Royal Institution at his laboratory
April 7, 1927	Bell Telephone Labs and AT&T gave USA public mechanical television demonstration over wire and radio circuits both
1928	Cable radio started
1932	Cable television started
1957	USSR launched its first satellite, Sputnik
1969	The first host-to-host Advanced Research Projects Agency Network (ARPANET) connection was made in October 25, 1969, between University of California at Los Angeles, and Stanford Research Institute, Inc. (SRI) in Menlo Park, California. ARPANET is the world's first operational packet switching network and the core network of a set that came to compose the global Internet
1972	ARPANET started to be used for communicating email
1973	The term "Internet" began to be used
1976	Comet, the first commercial email software, was offered by Computer Corporation of America for $40,000
1981	Al Gore coins the term for Internet "The Information Superhighway"
1990	The phrase "World Wide Web" was coined by Tim Berners-Lee
1992	Internet registration began for .com, .net. .org, .edu, and .gov.

1993	MOSAIC Web Browser was born in the University of Illinois at Urbana–Champaign campus
1993	World Wide Web was developed in CERN, the Institute for Particle Physics in Switzerland
1995	The independent programming language, JAVA, was created by Jim Gosling at Sun Microsystems
1995	Yahoo! was founded in Santa Clara, California and provides a web search engine, email service, mapping and more
1996	Hotmail was launched
1998	Google was founded by Larry Page and Sergey Bin
2001	Wikipedia was launched
2002	LinkedIn was founded by Reid Hoffman
2003	The first public beta version of Skype was released
2004	Gmail launched
2004	Facebook was founded in Cambridge, Massachusetts
2005	YouTube launched
2006	Twitter was founded in San Francisco, California
2009	WhatsApp was founded by Brian Acton and Jan Koum
2010	Pinterest was launched
2011	Google+ launched
2011	Twitter and Facebook are the primary means of communication for the Arab Spring
2012	Outlook.com was introduced

Table 2: Communication media in Education

1920	Radio for education
1940	Motion picture for training
1980	Connecting campuses through computers
1994	Internet for teaching
2002	OER (Open Education Resources)
2003	NPTEL (National Programme on Technology Enhanced Learning) video lessons
2004	Social networking
2005	Internet videos
2008	MOOCs for OER and initiation of e-courses by Indian Council of Agriculture Research (ICAR)
2009	NMEICT/NKN for infrastructure support
2013	Open courseware in agriculture by ICAR
2014	TELAgE (Technology Enhanced Learning in Agriculture Education) at ICAR- National Academy of Agricultural Research Management (NAARM)
2016	MOOCs at ICAR-NAARM
2017	Development of digital courses at NAARM for online and offline access

1.3 IMPORTANCE OF COMMUNICATION MEDIA

Modern communication media has become an important part of individual's life and today's society. It plays a vital role in dissemination of information. It helps in education, entertainment etc. Communication media keeps us informed about various happenings in the world and it educates us on different subjects. Each media method or process has their own functions and importance. Print and electronic media act as great

source of information and entertainment. Digital media is revolutionizing education sector. 93% of students have access to internet. Huge digital educational content such as video lectures, audio lectures for all kinds of beneficiaries are being made available on internet. TV and radio are broadcasting the lecture series and thus reaching the needy people in remote areas.

Social media is the most popular and the most accessed media across the globe. It is acting as a good platform to bring millions of people from different locations at one place and helping them to share their information, ideas, thoughts, views and much more. Information can be spread within fraction of seconds through this media. Social networking sites like Facebook, WhatsApp, Instagram, Twitter, LinkedIn, Google + and others open the door to share ideas, views and thoughts on the same platform. With the advancement of science and technology, the world has come closer to each other.

1.4 COMPUTER AIDED INSTRUCTION (CAI)

Computer-Assisted Instruction (CAI) Or Computer Aided Instruction (CAI) refers to drill-and-practice, tutorial or simulation activities. In parlance of education, Computer-Managed Instruction (CMI) describes instructional strategy with the aid of a computer to provide learning objectives, learning resources, record keeping, progress tracking and assessment of a learner's performance. Computer based tools and applications are used to assist teachers or school's administrator in management of the learner and the instructional process.

CAI is a self-learning technique, usually offline/online, involving interaction of a student with programmed instructional materials. It is an interactive instructional technique whereby a computer is used to present instructional material and monitor learning that takes place.

CAI uses a combination of text, graphics, sound and video in enhancing learning process. A computer has many purposes in a classroom, and can be utilized to help a student in all areas of curriculum.

CAI refers to the use of computer as a tool to facilitate and improve instruction. CAI programs use tutorials, drill and practice, simulation and problem solving approaches to present topics and test student's understanding.

1.4.1 Components of CAI

- Text, video, audio based content
- Objective questions that include multiple-choice questions, true or false, matching, short answer etc.
- Problems (numerical and descriptive)
- Immediate feedback with notes on incorrect responses
- Summarizes student's performance
- Exercises for practice
- Worksheets and self-evaluation tests

1.4.2 Types of Computer Assisted Instruction

- **Drill-and-practice** provides opportunities to students to repeatedly practice skills that have previously been presented e.g., self-evaluation interactive exercises to learn how to do a particular task.
- **Tutorial** activity includes presentation of information and its extension into different forms of work, including drill and practice, games and simulation.
- **Games** software can provide competitive scenario with the goal of achieving the highest score or outsmart other computers e.g. learn vehicle driving/racing through a gaming software.
- **Simulation** software can provide an approximation of reality that does not require expense of real life or its risks e.g. it can show how nutrients are assimilated by a plant or how internal combustion occurs in an engine which otherwise cannot be seen in real scenario.

- **Discovery** approach provides a large database of information specific to a course or content area and challenges a learner to analyze, compare, infer and evaluate based on exploration of the data e.g. case studies can be given to a learner which needs his higher order thinking skills to analyze.
- **Problem Solving** approach helps children develop specific problem solving skills and strategies e.g. provide a problem through an animation and allow learners to attempt at it and guide at every stage to solve the problem.

1.4.3 Advantages of CAI

- One-to-one interaction
- Flexi learning- students can decide when, where and what to learn
- Great motivator
- Freedom to experiment with different options
- Instantaneous response/immediate feedback to the answers elicited
- Self-pacing - allows students to proceed at their own pace
- Helps teacher can devote more time to individual students
- Privacy helps the shy and slow learners to learn
- Rapid learning
- Multimedia helps to understand difficult concepts through multi-sensory approach
- Aids in green learning as it minimizes the use of paper, pencil, board, chalk type of resources
- Helps learners to repeat the learning process if not understood properly- a teacher can simply be "paused or replayed" for reinforced learning

1.4.4 Limitations of CAI

- Sense of overwhelming by the quantum of information and technology
- Cyber wandering as banners/ads/multimedia overdose may divert attention from the content

- Can kill originality in thinking as the learning becomes too mechanical
- Shortage of good and relevant CAI packages
- lack of infrastructure

1.5 e-LEARNING IN AGRICULTURE EDUCATION

Agriculture education in India has been steadily moving towards digitalization for the last one decade. With the external support from World Bank through NAIP, ICAR has developed e- courseware for UG programs of all streams of agriculture, probably one of its kind in the world. The courseware has not only uplifted the quality of education in agriculture but also ensured uniformity and inclusivity in agricultural education which is imparted to the students in remote locations with more infrastructural constraints.

1.5.1 ICAR – e-Krishi siksha

ICAR-Education Division in partnership with ICAR-Agricultural Universities (AUs) System comprising State Agricultural Universities (SAUs), Deemed to be Universities (DUs), Central Agricultural University (CAU) and Central Universities (CUs) developed e-course contents, which are made available on ICAR e-Krishi siksha portal. A total of 406 course materials in seven disciplines viz. Agricultural Science, Fisheries, Dairy Science, Veterinary and Animal Husbandry, Horticulture, Home Science and Agricultural Engineering were developed by subject matter specialists of the respective disciplines at AUs, DUs. The materials were developed as per the approved ICAR syllabus for under graduate students. The portal is accessible to all teachers and students and free download facility is also provided.

URL: https://ecourses.icar.gov.in

Table 1.2 Subject wise course content on ICAR – e-Krishi siksha

Subject Area	No of Courses
B.Sc.(Agriculture)	49
B.V.Sc.(Veterinary & AH)	64
B.F.Sc.(Fisheries Science)	49
B.Tech. (Dairy Technology)	49
B.Sc.(Home Science)	89
B.Tech.(Agricultural Engineering)	56
B. Sc. (Horticulture)	50
Total courses	**406**

1.6 SCOPE OF COMMUNICATION MEDIA IN DIFFERENT FORMATS FOR AGRICULTURAL EDUCATION – FORMAL, VOCATIONAL, SKILL BUILDING

Education, both formal and informal modes, in agriculture, presents a vast scope to achieve and implement. Formal education reels under a severe faculty shortage of 40 percent while efforts in promoting informal education are far from being impressive. Distance education, a successful practice in other sectors, provides a key answer to address these issues. With a demand of developing 5,20,000 para-staff in specialized skill oriented areas in agriculture and allied sectors by 2019-20, the traditional approach of Distance Education needs a relook.

1.6.1 Agricultural Skill Council of India (ASCI)

Agriculture Skill Council of India, under the aegis of Ministry of Skill Development & Entrepreneurship, works towards capacity building by bridging gaps and upgrading skills of farmers, wage workers, self-employed & extension workers engaged in organized / unorganized segments of agriculture & allied Sectors.

ASCI covers segments like Farm Mechanization and Precision Farming, Agri-Information Management, Dairy Farm Management, Poultry Farm Management, Fisheries, Animal Husbandry, Post-Harvest Supply Chain Management, Forestry/ Agro Forestry, Watershed Management, Amenity Horticulture and Landscaping, Production Horticulture, Seeds Industry, Soil Health Management, Commodity Management, Agri Entrepreneurship & Rural Enterprises, and other allied sectors

1.7 ROLE OF MASS MEDIA IN DISSEMINATION OF FARM TECHNOLOGY

Modern agriculture is characterized among other things, by the salient role of communication as a factor of change and progress. Success of agriculture development in developing countries largely depends on the nature and extent of use of mass media in mobilization of people for development. Various mass contact methods are used to promote advanced technologies in agriculture to farmers, such as agri. newsletters, books, grey literature (brochures, bulletins, pamphlets and leaflets), hand bills and wall newspapers, posters, radio programs, television programs. Mass media is used for mass contact and for impersonal transmission of message to a large audience.

In a country like India, where literacy level is low among farmers, the choice of communication media is of vital importance. In this regard television and radio are significant, as they transfer modern farm technology to literate and illiterate farmers alike, even in remote areas, within a short time. Increasing rate of literacy in the country offers new promise and prospects for utilizing print medium as a means of mass communication. Agricultural journalism which came into existence five decades ago is of recent origin in India. India has farm magazines in every State, published mostly in local languages. Some of the popular agricultural magazines are listed below.

1.7.1 Popular magazines in India

- Indian Horticulture (Semi-technical, bi-monthly magazine in English)
- Indian farming (monthly magazine in English)
- Kheti (monthly magazine in Hindi)

- Phal Phool (bi-monthly magazine in Hindi)
- Krishika (a half yearly peer-reviewed research journal in Hindi)
- Horticulture Today
- Agriculture Today
- Agro India
- Modern Kheti
- Liesa India
- Farm Food
- Annadata (monthly magazine in Telugu)
- Bhoomi (Malayalam)
- Pasumi Vikatan (Tamil, fortnightly)
- Naveena Velaanmai (Tamil)
- Krishik Bandhu (Kannada)
- Adike Patrike (Kannada)
- Sahaja Samrudha (Kannada)
- Siri Samruddhi (Kannada)
- Sujata Sanchike (Kannada)
- Sahaja Saaguvali (Kannada)
- Krishi Mithra (Kannada)

1.7.2 Television Programmes on agriculture

- Atin Alamin
- Country calendar
- Green TV India
- Hariyali TV
- Krishi Darshan
- Today on the farm
- Annadata – ETV Telugu

1.7.3 Web-based ICT approaches

- Unilever's iShakti
- a-AQUA
- TNAU's agritech web portal
- AGMARKNET
- Agropedia
- AGRISNET
- DACNET
- e-Krishi
- Agriwatch
- iKisan
- e-Krishak sahyogi

1.8 ROLE OF SOCIAL MEDIA

Social media refers to interactive computer-mediated technologies that facilitate creation and sharing of information, ideas, career interests and other forms of expression via virtual communities and networks.

Social media outlets operate in a dialogic transmission system (many sources to many receivers). This is in contrast to traditional media which operates under a monologist transmission model (one source to many receivers), such as a newspaper which is delivered to many subscribers, or a radio station which broadcasts the same program to an entire city.

Main features of social media are:

- Social media are interactive as characterized by Web 2.0 Internet-based applications.
- User-generated content, like text posts or comments, digital photos or videos and data generated through an online interaction, is core of social media.

- Users create service-specific profiles for the website or app that are designed and maintained by the social media organization.
- Social media facilitates development of online social networks by connecting a user's profile with those of other individuals or groups.

Historically, social media started in mid 90s. Chronologically following is the order:

Table 1.3 Origin of Social Media

GeoCities	*November 1994*
Classmates	*December 1995*
First social media site with profiles, Six Degrees	*May 1997*
Open Diary	*October 1998*
Live Journal	*April 1999*
Ryze	*October 2001*
Friendster	*March 2002*
Corporate and job-oriented site LinkedIn	*May 2003*
hi5	*June 2003*
MySpace	*August 2003*
Orkut	*January 2004*
Facebook	*February 2004*
Yahoo! 360°	*March 2005*
Bebo	*July 2005*
text-based (limited to 14o characters per message) service Twitter	*July 2006*
Tumblr	*February 2007 and*
Google+	*July 2011*

Ever since Facebook was born in 2004, which started off as a simple information sharing tool across few friends, social media has become a rage in modern media. Present state of communication and knowledge transfer through social media has been due to the spurt in communication hardware like mobiles have become more multifunctional (a mobile is no longer a mere calling device.) , affordable (connectivity rate through wifi has become very affordable) and wider spread of the communication networks.

1.9 CONCLUSION

In addition to print and audio-visual media, digital media have gained importance and acceptability. Modern communication media plays vital role in dissemination of information. Social media is a good platform to bring millions of people from different locations at one place and helping them to share their information, ideas, thoughts and views. Computer based tools and applications are also being used to assist teachers in management of the learner and the instructional process.

1.10 LET'S SUM UP

This chapter dealt with the concepts of modern technologies of communication media with a historical perspective and relating it to the present trends. It emphasizes clearly that the modern media has a vast scope to promote knowledge sharing and access in agriculture, both in formal and informal, comprising vocational, skill building and educational streams.

1.11 Check Your Progress

1. Explain the transformation of Communication Media.
2. What is Social Media? Give few examples.
3. Define CAI and indicate its components.
4. Elucidate the role of communication media in agricultural education.
5. What does e-krishi shiksha deal about?

1.12 FURTHER READINGS/ REFERENCES/ LINKS

1. https://shodhganga.inflibnet.ac.in/bitstream/10603/122636/7/07.chapter%202%20.pdf
2. https://asci-india.com
3. http://wikieducator.org/Computer_Assisted_Instruction_(CAI)
4. MANAGE (2017). Social Media for Agricultural Extension. Extension Next Bulletin. no. 1, March 2017. https://www.manage.gov.in/publications/extnnext/March2017.pdf
5. MANAGE (2017). Harnessing Social Media for Agricultural Development. Extension Digest 191) June 2017. https://www.manage.gov.in/publications/edigest/jun2017.pdf

BLOCK IV: COMMUNICATION TO SUPPORT APPROPRIATE FLOW OF KNOWLEDGE AND LEARNING

UNIT-1

KNOWLEDGE MANAGEMENT PROCESS

Highlights of the Unit

- Objectives
- Introduction to Knowledge Management
- The value of Knowledge Management
- Agriculture Knowledge Management: The Role of ICT
- ICTs Role in Agriculture Knowledge Management
- ICTs in Agriculture – Experiences in India
- Media lab Asia
- Conclusion
- Let's Sum Up
- Check your progress
- Further Readings

1.0 OBJECTIVES

- To develop an understanding about concept and components of Knowledge Management
- To familiarize the learners about critical models useful for Agri-Communities
- To highlight the role of ICTs in Agri-Knowledge Management

1.1 INTRODUCTION TO KNOWLEDGE MANAGEMENT

Knowledge Management comprises of a range of strategies and practices used in an organization to identify, create, represent, distribute, and enable adoption of insight sand

experiences. Such insights and experiences comprise knowledge, either embodied in individuals or embedded in organizational processes or practice.

Knowledge Management efforts typically focus on organizational objectives such as improved performance, competitive advantage, innovation, sharing of lessons learned, integration and continuous improvement of the organization. KM efforts overlap with organizational learning, and may be distinguished from that by a greater focus on the management of knowledge as a strategic asset and a focus on encouraging the sharing of knowledge. KM efforts can help individuals and groups to share valuable organizational insights, to reduce redundant work, to avoid reinventing the wheel per se, to reduce training time for new employees, to retain intellectual capital as employees turnover in an organization, and to adapt to changing environments and markets.

Different frameworks for distinguishing between knowledge exist. One proposed framework for categorizing the dimensions of knowledge distinguishes between tacit knowledge and explicit knowledge. Tacit knowledge represents internalized knowledge that an individual may not be consciously aware of, such as how he or she accomplishes particular tasks. At the opposite end of the spectrum, explicit knowledge represents knowledge that the individual holds consciously in mental focus, in a form that can be easily communicated to others.

Early research suggested that a successful KM effort needs to convert internalized tacit knowledge into explicit knowledge in order to share it, but the same effort must also permit individuals to internalize and make personally meaningful any codified knowledge retrieved from the KM effort. Subsequent research into KM suggested that a distinction between tacit knowledge and explicit knowledge represented an oversimplification and that the notion of explicit knowledge is self-contradictory. Specifically, for knowledge to be made explicit, it must be translated into information (i.e., symbols outside of our heads). Later on, Ikujiro Nonaka proposed a model (SECI for Socialization, Externalization, Combination, Internalization) which considers a spiraling knowledge process interaction between explicit knowledge and tacit knowledge. In this

model, knowledge follows a cycle in which implicit knowledge is 'extracted' to become explicit knowledge, and explicit knowledge is ‘re-internalized’ into implicit knowledge. More recently, together with Georg von Krogh, Nonaka returned to his earlier work in an attempt to move the debate about knowledge conversion forward.

A second proposed framework for categorizing the dimensions of knowledge distinguishes between embedded knowledge of a system outside of a human individual (e.g., an information system may have knowledge embedded into its design) and embodied knowledge representing a learned capability of a human body’s nervous and endocrine systems.

A third proposed framework for categorizing the dimensions of knowledge distinguishes between the exploratory creation of "new knowledge" (i.e. innovation) vs. the transfer or exploitation of "established knowledge" within a group, organization, or community. Collaborative environments such as communities of practice or the use of social computing tools can be used for both knowledge creation and transfer.

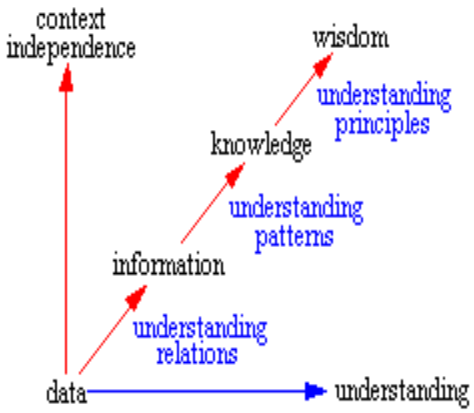


Fig. 1.2 Dimensions of Knowledge

Before attempting to address the question of knowledge management, it's probably appropriate to develop some perspective regarding this stuff called knowledge, which there seems to be such a desire to manage, really is.

Consider this observation made by Neil Fleming as a basis for thought relating to the following diagram.

- A collection of data is not information.
- A collection of information is not knowledge.
- A collection of knowledge is not wisdom.
- A collection of wisdom is not truth.

The idea is that information, knowledge, and wisdom are more than simply collections. Rather, the whole represents more than the sum of its parts and has a synergy of its own. We begin with data, which is just a meaningless point in space and time, without reference to either space or time. It is like an event out of context, a letter out of context, a word out of context. The key concept here is "out of context." And, since it is out of context, it is without a meaningful relation to anything else. When we encounter a piece of data, if it gets our attention at all, our first action is usually to attempt to find a way to attribute meaning to it. We do this by associating it with other things. If I see the number 5, I can immediately associate it with cardinal numbers and relate it to being greater than 4 and less than 6, whether this was implied by this particular instance or not. If I see a single word, such as "time," there is a tendency to immediately form associations with previous contexts within which I have found "time" to be meaningful. This might be, "being on time," "a stitch in time saves nine," "time never stops," etc. The implication here is that when there is no context, there is little or no meaning. So, we create context but, more often than not, that context is somewhat akin to conjecture, yet it fabricates meaning.

That a collection of data is not information, as Neil indicated, implies that a collection of data for which there is no relation between the pieces of data is not information. The pieces of data may represent information, yet whether or not it is information depends on the understanding of the one perceiving the data. I would also

tend to say that it depends on the knowledge of the interpreter, but I'm probably getting ahead of myself, since I haven't defined knowledge. What I will say at this point is that the extent of my understanding of the collection of data is dependent on the associations I am able to discern within the collection. And, the associations I am able to discern are dependent on all the associations I have ever been able to realize in the past. Information is quite simply an understanding of the relationships between pieces of data, or between pieces of data and other information.

While information entails an understanding of the relations between data, it generally does not provide a foundation for why the data is, what it is, nor an indication as to how the data is likely to change over time. Information has a tendency to be relatively static in time and linear in nature. Information is a relationship between data and, quite simply, is what it is, with great dependence on context for its meaning and with little implication for the future. Beyond relation there is pattern, where pattern is more than simply a relation of relations. Pattern embodies both a consistency and completeness of relations, which, to an extent, creates its own context. Pattern also serves as an Archetype with both an implied repeatability and predictability.

When a pattern relation exists amidst the data and information, the pattern has the potential to represent knowledge. It only becomes knowledge, however, when one is able to realize and understand the patterns and their implications. The patterns representing knowledge have a tendency to be more self-contextualizing. That is, the pattern tends, to a great extent, to create its own context rather than being context dependent to the same extent that information is. A pattern, which represents knowledge, also provides, when the pattern is understood, a high level of reliability or predictability as to how the pattern will evolve over time, for patterns are seldom static. Patterns which represent knowledge have a completeness to them that information simply does not contain.

Wisdom arises when one understands the foundational principles responsible for the patterns representing knowledge being what they are. And wisdom, even more so than knowledge, tends to create its own context. I have a preference for referring to these

foundational principles as eternal truths, yet I find people have a tendency to be somewhat uncomfortable with this labeling. These foundational principles are universal and completely context independent. Of course, this last statement is sort of a redundant word game, for if the principle was context dependent, then it couldn't be universally true, now could it? So, in summary the following associations can reasonably be made:

- Information relates to description, definition, or perspective (what, who, when, where).
- Knowledge comprises strategy, practice, method, or approach (how).
- Wisdom embodies principle, insight, moral, or archetype (why).

1.2 THE VALUE OF KNOWLEDGE MANAGEMENT

In an organizational context, data represents facts or values of results, and relations between data and other relations have the capacity to represent information. Patterns of relations of data and information and other patterns have the capacity to represent knowledge. For the representation to be of any utility it must be understood, and when understood the representation is information or knowledge to the one that understands. Yet, what is the real value of information and knowledge, and what does it mean to manage it?

In this example what needs to be managed to create value is the data that defines past results, the data and information associated with the organization, its market, its customers, and its competition, and the patterns, which relate all these items to enable a reliable level of predictability of the future. What I would refer to as knowledge management would be the capture, retention, and reuse of the foundation for imparting an understanding of how all these pieces fit together, and how to convey them meaningfully to some other person.

The value of Knowledge Management relates directly to the effectiveness with which the managed knowledge enables the members of the organization to deal with today's situations and effectively envision and create their future. Without on-demand

access to managed knowledge, every situation is addressed based on what the individual or group brings to the situation with them. With on-demand access to managed knowledge, every situation is addressed with the sum total of everything anyone in the organization has ever learned about a situation of a similar nature. Which approach would you perceive would make a more effective organization?

1.3 AGRICULTURE KNOWLEDGE MANAGEMENT: ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

The emergence of Information and Communication Technologies (ICTs) in the last decade has opened new avenues in knowledge management that could play important roles in meeting the prevailing challenges related to sharing, exchanging and disseminating knowledge and technologies. ICT allows capitalizing to a greater extent on the wealth of information and knowledge available for Agriculture Knowledge, Science and Technology (AKST). The ultimate objectives of AKST activities are to come up with results that can advance research more in certain areas, and engender technologies that AKST stakeholders can use to increase production, conserve the environment, etc.

The first challenge is the poor mechanisms and infrastructure for sharing and exchanging agriculture knowledge generated from research at national and regional levels. Many research activities are repeated due to the lack of such mechanisms and infrastructure at the national level. Researchers can find research papers published in international journals and conferences more easily than finding research papers published nationally in local journals, conferences, theses and technical reports. The second challenge is the inefficient mechanisms and infrastructure for transferring technologies produced as a result of research to growers either directly or through intermediaries (extension subsystem). Knowledge and technologies fostering agricultural production and environment conservation are examples. Although many extension documents are produced by national agriculture research and extension systems to inform growers about the latest recommendations concerning different agricultural

practices, these documents are not disseminated, updated or managed to respond to the needs of extension workers, advisers and farmers. This is also true for technical reports, books and research papers related to production. The third challenge is keeping the indigenous knowledge as a heritage for new generations. It is available through experienced growers and specialists in different commodities. These inherited agricultural practices are rarely documented, but they embody a wealth of knowledge that researchers need to examine thoroughly. The forth challenge is easily accessing and availing economic and social knowledge to different stakeholders at operational, management and decision-making levels, so that those responsible will be able to make appropriate decisions regarding the profit making of certain technologies and their effect on resource-poor farmers.

1.4 ICTS ROLE IN AGRICULTURE KNOWLEDGE MANAGEMENT

Knowledge sharing, exchanging and dissemination are elements in a broader theme which is knowledge management. The central purpose of knowledge management is to transform information and intellectual assets into enduring value (Metcalfe, 2005). The basic idea is to strengthen, improve and propel the organization by using the wealth of information and knowledge that the organization and its members collectively possess (Milton, 2003). It has been pointed out that a large part of knowledge is not explicit but tacit (Schreiber et al., 1999). This is true for knowledge in agriculture where a lot of good practices are transferred without being well documented in books, papers or extension documents. To manage the knowledge properly, ICT is needed. In effect, there are many information technologies that can be used for knowledge management. The following paragraphs describe these technologies and emphasize their roles in agriculture knowledge management. Content management system, in its wider sense, including data bases and multimedia, is the core technology of information and knowledge management. This technology can be used in different applications:

Building a national agriculture research information system (NARIS) needs to include research outcomes, projects, institutions and researchers in every country, and a

regional research information system that works as a portal for all the NARIS. Developing an information system of indigenous agricultural practices can enable researchers to examine this knowledge and decide on its usefulness for sustainable development. Such a system will also keep this knowledge for future generations before it disappears as a result of advanced technologies. Developing an information system and recording matured technologies on a trial basis have proven successful, and success stories that have achieved economic growth will strengthen the interaction between inventors and innovators. This will lead to an innovation-driven economic growth paradigm.

Storing and retrieving images, videotapes and audiotapes related to different agricultural activities are necessary. Geographic information systems (GIS) are needed to store databases about natural resources with a graphical user interface that enables users to access these data easily using geographical maps. Decision support system techniques are needed in many applications viz. simulating and modeling methods can be used to build computer systems that can model and simulate the effect of different agricultural production policies on the economy and the environment to help top management make decisions. Using expert systems technology to improve crop management and track its effect on conserving natural resources is essential. Expediting the expert systems development by generating agriculture specific tools to overcome the well-known problem of knowledge is also required.

Mining growers' problems database, which is part of the Virtual Extension and Research Communication Network (VERCON), to discover the best practices from the solutions provided by the human experts and to find out whether there are any discrepancies in their recommendations is necessary. Modern ICT—Internet and Web technology—is needed to make these systems available regionally and globally. Accessing the Internet will bring a wealth of information to all agriculture stakeholders in rural and urban areas and will help in overcoming the digital divide. As most farmers have no hands-on-experience or access to digital networks, leaders of national agricultural research and extension systems should be encouraged to consider the ICT

option. Training farmers and extension workers, including women, in ICT will help them access a lot of useful information if each country tries to develop contents in the language people are using.

1.5 ICTS IN AGRICULTURE – EXPERIENCES IN INDIA

Information and Communication Technology (ICT) in agriculture is an emerging field focusing on the enhancement of agricultural and rural development in India. ICT is affecting all spheres of life. Due to the advancement in technologies, high-speed reliable computers are available with huge storage capacities at an affordable cost. Database and data warehousing technologies can be used to store and retrieve large amount of information and also can be coupled with Mobile & Internet Technologies to deliver information instantaneously to the community. Development in ICTs has enabled the maintenance of huge and variety of information (text, image, voice and video) repositories with negligible downtime that can be quickly extracted by millions of users concurrently. Data mining technology is being used to extract useful knowledge from huge databases. Now the research challenge, here, is to identify the areas in agriculture where progress in ICT could be used to improve the performance of farmers and farming technologies, and build efficient ICT-based model / system that improves the living standards of farming communities.

1.6 MEDIA LAB ASIA

Media Lab Asia (MLAsia) has been set up by Department of Information Technology, MCIT, and Government of India as a company under section 25 of Companies Act. MLAsia's mission is to develop and deploy technological solutions that are low-cost, accessible and relevant to the common citizen. As a result of engagement over several years, MLAsia has acquired enough experience in application of ICT for the grass roots development. Media Lab Asia's application development is focused on use of ICT for Healthcare, Education, Livelihood Enhancement and Empowerment of the disabled.

Modes of delivery of data/services being adopted by MLAsia primarily include ICT tools such as internet, mobile and satellite. In some cases, the services are being delivered through centers also. The importance of the Media Lab Asia projects is amply validated by the recognition these have received from National and International agencies such as MSJ&E, NASSCOM, DST-INTEL, National Award, CSI, and MANTHAN in India & Stockholm Challenger Society, DaVinci, and UNESCO & WSIS at international level. With the help of its 75+ projects Media Lab Asia is touching the lives of more than 1 million Indians. Media Lab Asia has been working with a number of academic, R&D, industry, Government and NGOs in its endeavor of technology development, field testing and deployment.

1.7 LET'S SUM UP

Knowledge Management much talks about how it comprises its strategy, practice, method or approach towards organization growth based on its value. It not only contributes towards every stakeholder but mainly bring towards organization value system. As the value of the organization is based on Knowledge enabled, it benefits the end beneficiary i.e. farmers for their betterment of their life through agriculture development.

The ICT enabled models can lead to better Knowledge Management models for creating aware, understand, use and apply Knowledge in faming as per need arise to farmers in particular, and other stakeholders in general.

1.8 CHECK YOUR PROGRESS

1. Which of the following statements do you agree with?
   a. ICT should enable knowledge management strategy rather than drive it
   b. ICT should be the starting point for a knowledge management strategy.

c. The most important factor in a knowledge management strategy is ICT.

d. ICT is not relevant to knowledge management strategy.

2. The following strategy option should be used to bring people together to share knowledge from dispersed parts of the organization.

a. Storytelling.

b. Competitive intelligence.

c. Communities of practice.

d. E-learning.

3. Which of the following statements do you agree with relating to knowledge audits?

a. A knowledge audit should always be completed before an information audit.

b. Information and knowledge audits are complementary processes.

c. Information and knowledge audits are the same.

d. Information and knowledge audits are unrelated.

4. People knowledge includes which of the following?

a. Relational information

b. Insights.

c. Intuitions

d. All of the above

5. Which of the following knowledge can be articulated, codified, and stored in certain media?

a. Tacit Knowledge.

b. Explicit Knowledge.

c. Declarative Knowledge.

d. Procedural Knowledge

6. Which of the following is the knowledge that people carry in their minds and is, therefore, difficult to access?

a. Tacit Knowledge.

b. Explicit Knowledge.

c. Declarative Knowledge.

d. Procedural Knowledge

7. Which one of the following is a property of knowledge capturing?

a. Choosing appropriate expert.

b. Taping the expert's knowledge.

c. Determining feasibility.

d. All of the above.

8. Following Are the components of KM except:

a. People.

b. Currency.

c. Process.

d. Technology.

9. Human receive information in which of the following way?

a. Seeing

b. Hearing

c. Smelling

d. All of the above

10. The term _____ refers to a set of sequenced planned actions or events intended to help an organization increase its effectiveness.

a. Performance Management

b. Intervention.

c. Institutionalization.

d. Knowledge Management

1.9 SUGGESTED READINGS/ REFERENCES

1. Media Lab Asia is available at http://www.medialabasia.org/.
2. Ikujiro Nonaka, "Towards Organizational Knowledge", 2013. The Palgrave Macmillan Publication, UK.
3. Fleming, N., Baume, D. (2006). Learning Styles Again: VARKing up the right tree! Educational Developments. SEDA Ltd. Issue 7.4. Nov.4-7.
4. Metcalf, A.S., "Knowledge Management and higher education: A critical analysis", January 2005, IGI Global.
5. Milton, Nick, "Knowledge Management for Teams and Projects, January 2005, OAI.
6. Schreiber, G., Akkermans, H., Anjewierden, A., de Hoog, R., Shadbolt, N., de Velde, W.V. and Wielinga, B. (1999), Knowledge Engineering and Management: The Common KADS Methodology, MIT Press, Massachusetts.
7. FAO, "Virtual Extension and Research Communication Network (VERICON)", FAOR&E Division (NRR).

UNIT- 2

USE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) FOR AGRICULTURAL DEVELOPMENT

Highlights of the Unit

- Objectives
- Introduction
- e-Extension in Agriculture
- e-Extension initiatives
- Expert Systems in Agriculture
- Application of Remote Sensing and GIS RS in Agriculture
- Conclusion
- Let's Sum Up
- Further Readings
- Check your progress

2.0 OBJECTIVES

- To familiarize the learners with the terminologies used in ICTs
- Understand the concept of village knowledge centre, Village Resource centre
- Have knowledge about the E-extension initiatives
- Understand the applications of RS and GIS in Agriculture

2.1 INTRODUCTION

Information Technology (IT) encompasses all of the technology that we use to collect, process, protect and store information. It refers to hardware, software (computer programs) and computer networks. Information and Communication Technology (ICT) concept involves transfer and use of all kinds

of information. It is the foundation of economy and a driving force of social changes in the 21st century. It affects all aspects of life as we know it and without it, life would be virtually unimaginable. Distance is no longer an issue when it comes to accessing information, for example, work and distance learning, e - banking, e - government.

The phrase ICT was coined by Stevenson in his 1997 report to the government and promoted the new National Curriculum document. Information communication technologies is a term which is currently used to denote a wide range of services, applications and technologies, using various types of equipment and software, often running over telecommunication network. The importance of ICTs is not the technology as such, but it's enabling function in access to knowledge, information and communications, increasingly important elements in today's economic and social interactions.

The ICT term includes all technical terms that are used for handling information and facilitating communication, including computers, network hardware, communication lines and all the necessary software. In other words, ICT is comprised of information technology, telephony, electronic media, and all types of process and transfer of audio and video signals and all control and managing functions based on network technologies.

2.2 e-EXTENSION IN AGRICULTURE

The challenges before Indian agriculture are immense. The agricultural growth rate is sluggish and stagnating. The sector needs to grow at a faster rate than 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 of India. Given its range of agro-ecological setting and produces, Indian agriculture is faced with a great diversity of needs, opportunities and prospects. The water scarce-rain fed areas, which account

for 63 per cent of the cultivated land, exhibit low and also unstable yield and technology transfer gaps are much wider as compared to those of irrigated areas. National seminar on agricultural extension 2009 background note states that sustaining growth rate and achieving the required food grain production of 320 million tonnes by 2025 would be a Herculean task considering some of the challenges like nonexpanding land, depleting soil and water resources, adverse impact of climate change, rising cost of production, diminishing agriculture labour availability and farmers reduced interest in agriculture. If India is to respond successfully to these challenges and also to achieve accelerated growth needs, vibrant and innovative technology generation and delivery system are required. Greater attention will have to be paid to technology dissemination. To make farm information and technology transfer more effective, greater use will need to be made of modern information and communication technology among researchers, extension personnel, farmers and other stakeholders. Further, the agricultural extension requires paradigm shift from top-down, blanket recommendation 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' agricultural scientists and extension personnel is the most critical missing component of agricultural extension. To assist the farmer in these changing contexts, new strategies and innovative solutions are urgently required which in turn will require technological support.

2.2.1 Need for E-Extension

1. To accelerate agricultural growth

Recommendation of the Planning commission of India's working group on

agricultural extension for XI five year plan (2007-2011) states that the agricultural growth is stagnating and sluggish. Hence, there is an immediate need of vibrant, dynamic and innovative approach to be adopted for agricultural extension in order to achieve targeted growth rate and serve the farmers better. Integration of ICTs in agricultural extension will provide needed impetus to agricultural sector.

2. To expand knowledge resource

India feeds 16 per cent of world population with 2.4 per cent of global land. Land and water resources are almost reaching their limits, hence achieving food security heavily relies on "Knowledge Resource". In this scenario, ICTs can complement the traditional extension system for "Knowledge Resource" delivery to the millions of the farmers.

3. To facilitate better information access

Estimates indicated that 60 per cent of farmers do not access any source of information for advanced agricultural technologies resulting in huge adoption gap (NSSO, 2005). In this context, it is expected that convergence of ICTs with traditional extension system will improve the farmers' information access.

4. To supplement inadequate technical manpower

In India, there are about 120 million farm holdings and the number is growing year by year. It proposes to provide one village extension personnel for 800-1000 farm families than the requirement of field level extension personnel which is estimated to be about 1300000-1500000, against which the present availability is only about 100000 personnel (PC, GoI, 2007). In this scenario, inadequate technical manpower to be for some extent compensate by the extensive use of ICTs.

5. For stronger research-extension – Client system linkage

ICTs are required to facilitate stronger linkages with research- extension-client system. The feedback received through ICTs to be more accurate and faster.

6. To develop efficient feedback mechanism

Lack of efficient feedback mechanism in the research- extension linkage was identified as one of the weaknesses in the existing extension systems. Hence, it is believed that the media and ICTs will offer strong potential to improve linkage mechanism.

7. For cost-effective extension delivery

The ICTs tools such as: Internet and Mobile networks have the potential to provide agro-information services that are; affordable, relevant (timely & customized), up-to- date, high accessibility and farmer friendly.

8. To develop knowledge managers

The experience of rural centers shows that ICTs can help in enabling rural development workers to gather, store, retrieve, adapt, localized and disseminate a broad range of information needed by rural families. This, in turn, leads to the emergence of knowledge workers that will result in the realization of a bottom- up, demand- driven paradigm for technologies generation, assessment, refinement and adoption.

9. To ensure gender equity in technology transfer process

Traditional extension is widely criticized for not concentrating women cultivators. Research evidences show that ICT enabled extension system offers equal opportunity to the farm women.

10. To empower small and marginal farmers

In India 77 per cent of cultivators are marginal farmers. Land holding declined from 2.28 hectare per family to 1.41 hectare. Empowering small and

marginal farmers with the right information at the right time and place is essential for improving efficiency and vitality of small and marginal holdings.

11. To serve the farm stakeholders beyond technology transfer role

There is a growing recognition that extension must go beyond transferring new food crop technology to farmers and focus on helping the rural poor by promoting agriculture diversification, increasing rural employment and helping farmer gain access to biotechnology and access to export markets and also environment awareness and rural health awareness. To perform this expanded role, extension systems should be equipped with ICTs

2.3 e-Extension Initiatives

2.3.1 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.

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

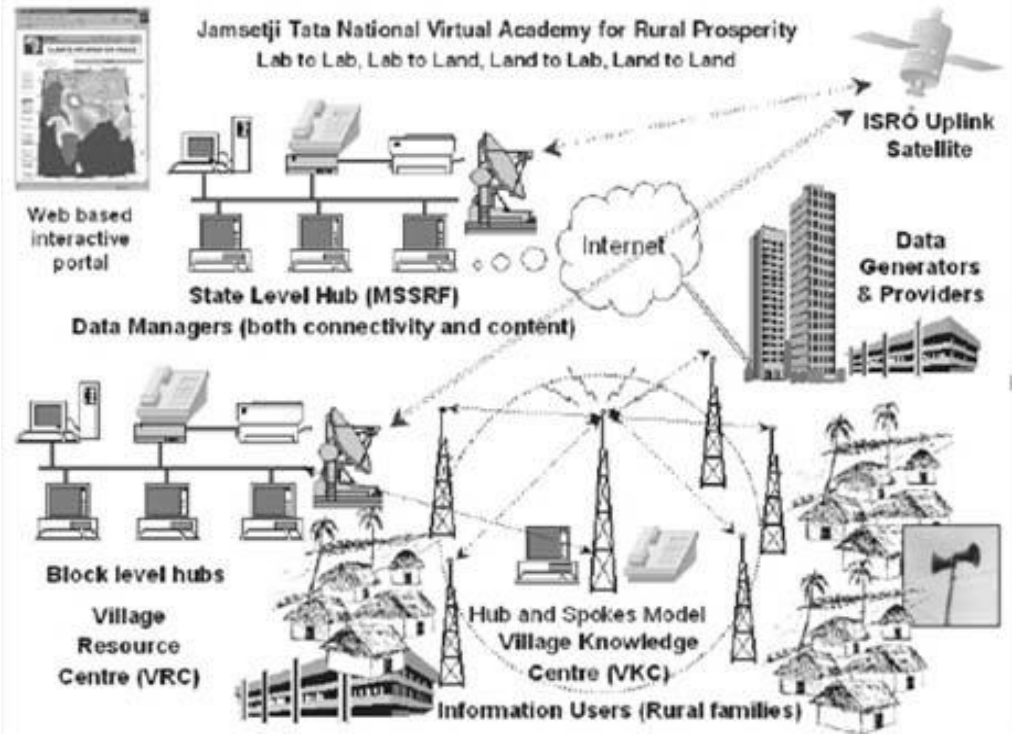
(even though there have been some exceptions to this rule based on an individual's ability), is then trained by MSSRF on basic computer operations and applications. The volunteer is given training in Windows O/S, MS Office Suite, Adobe PageMaker and Photoshop, Visual Basic, Visual C++, HTML, voice recording, 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 1, 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.

Fig 2.1 Architecture of MSSRF



2.3.2 Village Resource Centre (VRC)

The VRC concept has been evolved by Indian Space Research Organization (ISRO) and implemented through a partnership with Regional Remote Sensing Service Centre (RRSSC) by integrating ISRO's capabilities in satellite communications and satellite based earth observation to disseminate a variety of services emanating from the space systems and other Information Technology tools to address the changing and critical needs of rural communities. The VRC is a totally interactive VSAT (Very Small Aperture Terminal) based network. The network uses one of the Extended C-band transponders of the INSAT-3A satellite. Users located at one node of this network can fully interact with others located at another node through video and audio links.

The VRCs, aimed at serving essentially as Community Resource and addressing the dynamic and critical needs of rural communities in the most efficient ways are planned to be set up in selected backward, distant, remote, and vulnerable areas. Two facets of VRC have been envisaged. One is Governmental domain, wherein access to information/ decision support is provided to the functionaries of the Government at various levels. The second is the public domain, where information and services are accessed by community themselves.

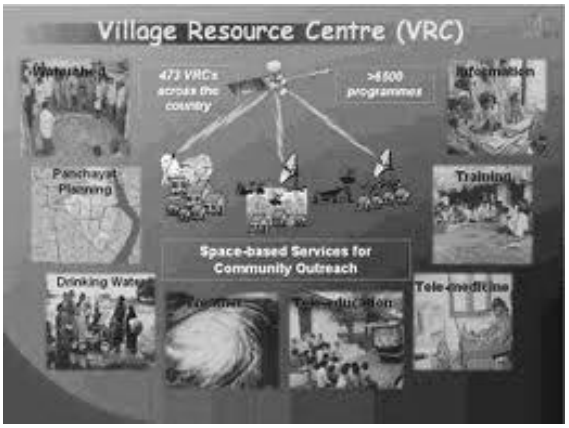


Fig 2.2 Components and Potential of VRCs with special reference to Indian Space Research Organization (ISRO)

Village Resource Centres became single window delivery mechanism for tele medicine, tele education, natural resources data, agriculture advisories, land & water resources advisories; interactive farmers' advisories; e-governance services and weather advisories. It will also be involved in capacity building of the community to enhance its awareness and knowledge levels. The VRCs will provide information on health, education, nutrition, gender issues, legal services and women empowerment (VRC, 2006).

2.3.3 Common Service Centres (CSCs) Scheme

Common Service Centres (CSCs) Scheme is the nationwide initiative of Government of India to provide support for establishing 100 000 Common Service Centres in 600 000 villages of India. CSCs scheme has been started in 2004 with the vision to develop these centers as a front-end delivery points for Government, private and social sector services to rural citizens of India in an integrated manner.

Fig. 2.3 Common Service Centres

2.3.4 WEB PORTALS

A. Farmer Portal – An e-Governance Project of Government of India

Farmers' Portal is an endeavor to create a one-stop shop for meeting all information needs, relating to Agriculture, Animal Husbandry and Fisheries, of an Indian farmer. With this the Indian Farmer will not be required to sift through a maze of websites created for specific purposes. Once in the Farmers' Portal, a farmer will be able to get all relevant information on specific subjects around his village/block /district or state. This information will be delivered in the form of text, SMS, email and audio/video in the language he or she understands. These levels can be easily reached through the

interactive map of India placed on the Home page. Farmers will also be able to ask specific queries as well as give valuable feedback through the Feedback module specially developed for the purpose.

Genesis of the requirement

Extension services in India have gone through vicissitudes since the Green Revolution (from monologues & speeches to personal outreach to farmer to farmer extension to bulk use of non-P2P methods) when targeted approach centered around specific crops in irrigated areas of North India became the major focus. Before modified Agriculture Technology Management Agency (ATMA) scheme was launched in the year 2010, there was no dedicated manpower for extension in agriculture and allied sectors. The Government officials and specialists were also burdened with multifarious duties of implementation of projects, scheme and programs besides participating in various meetings. Thus a large number of villages remain deprived of interactive methods direct training which were launched after Training & Visit Program lost its relevance due to sheer disproportionate numbers (farmer population : extension workers) in the rain-fed area that was being focused upon. Due to vast size, huge population and difficult topography of the country, dissemination of information in timely manner was a major challenge. Electronic media also had its own constraints due to limitation in time slot available and vast area & subjects to be covered in variegated scenario of Indian Agriculture.

Despite major improvement in the state of affairs on extension front, the divergent need of the farmers could not be fully addressed. Specific requirements of the farmers based on their crops and agro climatic situation also could not be addressed on a large scale. Therefore, during the XII Plan, a National Mission on Agricultural Extension & Technologies was formulated encompassing not only Extension & ICT but also Seeds & Planting Material, Mechanization and Plant Protection. SMS Portal has been conceptualized to give a quantum leap in coverage of farmers and geographical area in a timely, specific, holistic and need based knowledge dissemination among the farmers by

leveraging the power of mobile telephony in such a way that all sectors use this platform to not only reach out to the farmers but also to address their concerns and queries.

A centralized knowledge base was first created purely from the farmers' perspective and was termed Farmers' Portal (www.farmer.gov.in). While over 800 websites of various departments and organizations related to Agriculture & allied sectors in the Central and State Governments and 80 applications/portals of the Department pertained to agriculture & allied sectors from organizational and schematic view-point, not even one portal existed for the farmers and that was the genesis of the Farmers' Portal: of which SMS Portal was an integral part. Considering popularity of the portal as reflected from tens of thousands of hits being received by SMS Portal everyday by the user department / organizations as well as farmers & other stakeholders, a new third level domain has now been created for all mobile based services for farmers on a Unified Portal www.mkisan.gov.in.

This portal facilitates a single window solution to farmers and stakeholders to access/ disseminate information relating to Seeds, pesticides, Farm Machinery, Fertilizers, Agromet advisory, market prices, insurance, storage, credit, crops, extension activities, beneficiary list under NHM and NFSM, MSP determination, programs and schemes, farmer-friendly literature and videos.

Fig 2.4.1 Farmer's Portal

Fig 2.4.2 Input Dealers information of Seed, Fertilizer, Pesticide and Farm Machinery

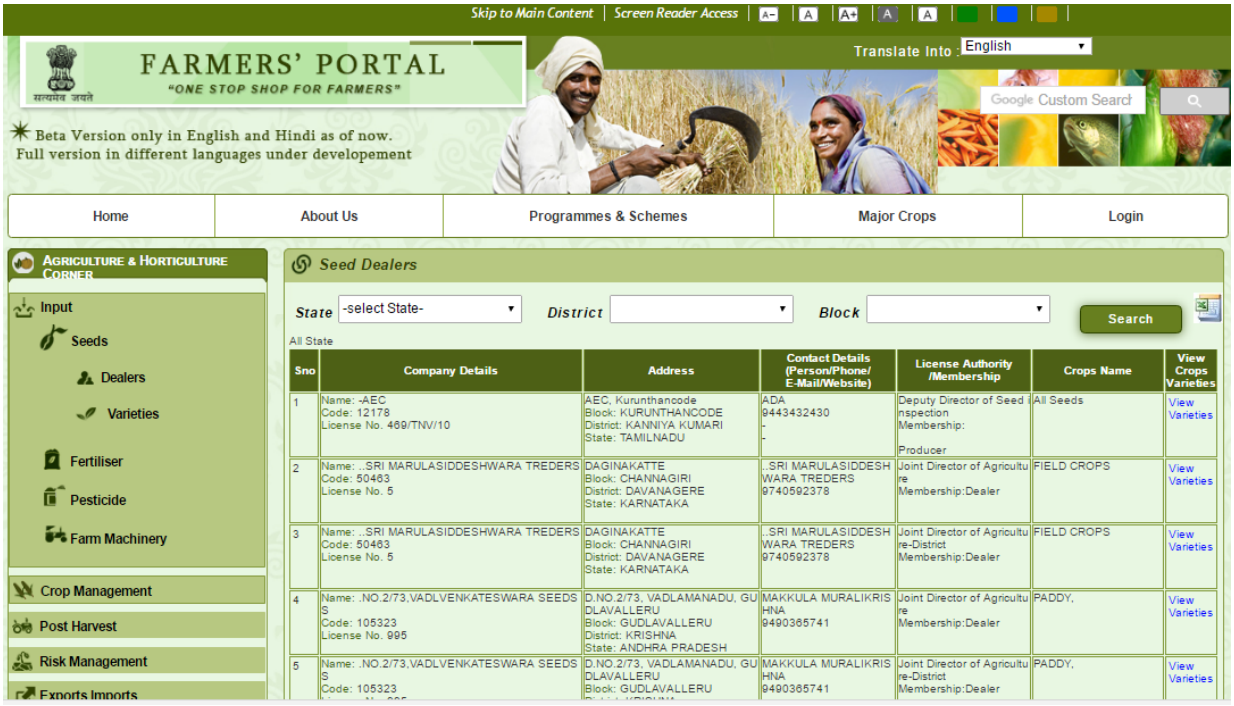


Fig 2.4.2 Crop Management: Farmer friendly material

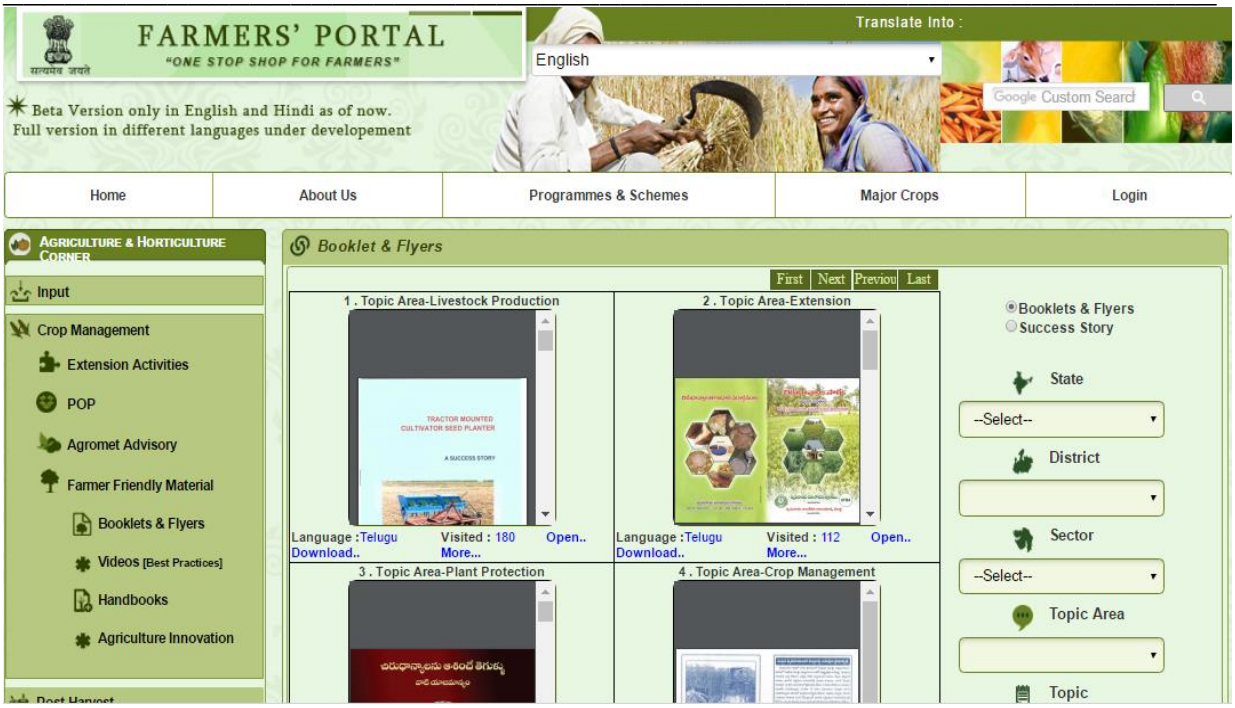


Fig 2.4.3 Post-Harvest Information:
Storage (CWC/SWC/Grameen Bandaran), Cold Storage

B. Rice Knowledge Management Portal (RKMP)

Rice Knowledge Management Portal developed by the Indian Council of Agricultural Research (ICAR) service as an information highway to share rice knowledge among the stakeholders. The Extension and Farmers domains provide production know how, package of practices, FAQs etc., in English and local languages. In research domain, various services are provided such as

AICRIP Intranet, archives of AICRIP data (27000 datasets!), communities of practice (CoP), bio-informatics suite, approach papers, India Rice Research Repository (i3R), status papers on rice for different states etc. The portal operates two e-learning platforms providing learning opportunity to scientists and extension workers at their time and space. This portal also caters to information needs of exporters and farmers through the trade information system. Another feature of the portal is the indexing of mandi prices of paddy from regulated market yards (from Agmarknet). Policy makers can directly access area, production, productivity trends of last four decades up to district level. This portal is an example of harnessing the enormous potential of ICT strategies to manage the voluminous knowledge in the existing ICAR (AICRIP) set up. The vision of RKMP is to serve a wide range of stakeholders and help in better planning to realize higher productivity & production of rice through improved knowledge and skill from the portal (www.rkmp.co.in).

C. TNAU AGRI-TECH PORTAL

Tamil Nadu Agricultural University (India) has explored the power and potential of Information and Communication Technology (ICT) intervention in Transfer of Farm Technology which may accelerate the farm information and knowledge sharing. TNAU AGRI-TECH Portal provides information on agriculture and allied sectors. Further, portal also having information on special

technologies, market and weather. Multimedia resources also hosted in the portal (http://agritech.tnau.ac.in/).

Fig. 2.4.4 Weather forcast portal

D. e-Krishi

The e-Krishi project, Market driven Agricultural Initiative through IT enabled Agri Business Centres in Kerala, addresses the existing gap in agriculture information flow and transaction management. The project envisages facilitating and enabling farmers and other Stakeholders through Agri Business Centres to interact with Agricultural Service Providers in the Private, Government and Nongovernment sectors. The project provides a web based solution enabling the small and medium farmers as well as owners of large landholdings. Piloting was done in Malappuram with the participation of the existing Akshaya e-Kendra Entrepreneurs. The facilities and resources of Akshaya e-Kendras in terms of computers, printers, scanners, cameras, etc. and intranet/internet connectivity, already established throughout Malappuram District of Kerala (about 550 e-Kendras), can be leveraged to reach the masses of farming community and other stakeholders in Agriculture sector (http://www.e-krishi.org). The e-Krishi portal also provides Farm Advisory Services (Crop Information, Fertilizer Recommendation, Planting Material Availability, Fertilizers and Pesticides, Weather Information), Agri- Market Information (Vegetable and Fruit Price, Daily Market Price, Market Analysis

Report and Commodity Exchange), Resource Library: e-Krishi Eco-System, e-Krishi information centers, Photo Gallery, Model e- Krishi Project,

KISSAN Video Channel. Further, e-Krishi news and online expert advisory, trade login and call centre support are the special features of the e-Krishi web portal (http://www.e-krishi.org).

Fig 2.4.5 Akshaya e-Kendras portal

E. IFFCO- Agri-Portal

The Indian Farmers Fertilizer Cooperative (IFFCO) is one of the World's largest manufacturers of fertilizer. The IFFCO's agri-portal'-Sixteen states have been covered with information of relevance to farmers in local languages and can be accessed through IFFCO's website www.iffco.nic.in. User-friendly intuitive graphic based navigation is provided to facilitate viewing in touch screen environment. IFFCO has also installed about 100 Farmers Information Kiosks in 16 states. Training programmes and farmers meetings are conducted to encourage farmers to use the facilities provided in farmers' information kiosks (Patil *et al.*, 2009).

Fig 2.4.6 IFFCO Portal

F. Digital Green – Participatory Video for Agricultural Extension

digitalGREEN

Digital Green (DG) is an ICT based research project for the production and dissemination of locally relevant agricultural through participatory video and mediated instruction. The digital Green farm based video has been interactively designed, deployed and evaluated among the small and marginal farmers of the Karnataka State of India. The project was initiated by the Microsoft Research, India in collaboration with Green Foundation, an NGO. Farmer participatory video recordings facilitate the aggregation of scattered information into systematic and comprehensive format with a localized context. The video recordings are made by teachers of agricultural at grassroots level and expert reviewers ensure the accuracy, clarity and completeness of the context and guide the construction of a time and location sensitive video based curriculum.

First, awareness meetings on DG services were conducted; interested farmers were identified and new content was recorded. Content was provided by local farmers with the guidance of experts. Selected farmers were deployed for field adoption, and content screenings were used to learn, adopt and innovate better agricultural practices.

Fig 2.4.7 Digital Green's services

Community members act as mediators to conduct a minimum of three screening per week during suitable evening hours and mediators act as a facilitators, mediators are paid honorarium up to INR 1, 500 (USD 38) per month and they additionally supported by a full time extension staff either from the government or NGO. The Digital Green one year trial involving 20 villages (1, 470 households) in Karnataka, India increased the adoption of certain agricultural practices seven fold over a traditional extension system and ten times more effective per dollar spent (www.digitalgreen.org). DG system was able to multiply the value of a NGO's extension agents by a factor of 10 times per dollar spent.

G. ICTs FOR MARKET INFORMATION

The project is about empowering farming community with the knowledge of latest commodity prices and arrivals information through innovative usage of ICT by networking agricultural produce wholesale markets in the country. It was initiated with the objectives of Networking 2800 major agricultural produce

wholesale markets; imparting computer awareness and application usage training to about 5000 market personnel; dissemination of daily commodity prices and arrivals information in major Indian languages. In order to bring the farmers in a better bargaining position and to promote a culture of good agricultural marketing practices in the country, Directorate of Marketing and Inspection (DMI), Ministry of Agriculture, Government of India has embarked upon an ICT Project: NICNET based Agricultural Marketing Information System Network (AGMARKNET) as part of the Central Sector Scheme: "Marketing Research and Information Network".

Fig 2.5 Agmarket website

(Source: http://www.stockholmchallenge.se/ data/Agmarknet).

The project, launched during later part of Ninth Plan Period (1997-2002), involves progressively linking all the agricultural produce wholesale markets, State Agricultural Marketing Boards/ Directorates and DMI offices for effective exchange of market information. National Informatics Centre (NIC) is executing the project on turnkey basis. Project components include installation of basic ICT infrastructure at markets and their networking, capacity building, application

development to facilitate creation of market level database as well as a national database on daily commodity arrivals and prices and a portal to gradually serve as a single window facility for disseminating all information pertaining to agricultural marketing. Presently, more than 1000 markets from different parts of the country are reporting data regularly to the portal. Functional days of markets being different, more than 300 markets are sharing information on daily basis for the use of public at large

Price related information

Information on price of agricultural commodities is collected by Auction Officers in the mandi through the process of auction that takes place from early in the morning and goes up to lunchtime. The data is usually sent by e-mail from the mandi in the afternoon indicating the day's minimum price of the commodity, the maximum price and the modal price, i.e. the price at which the maximum sales have taken place. The quantity of arrivals is also reported. E-mail from all the markets are compiled in the DMI/NIC Headquarter and after verification uploaded on the portal. Information on the portal is in public domain and can be accessed freely. As on date, price information in respect of more than 300 commodities and 2000 varieties are reported on the Site.

Market related information

In addition to price, several other markets related information is provided on the portal. These relate to accepted standards of grades, labeling, sanitary and phyto-sanitary requirements, physical infrastructure of storage and warehousing, marketing laws, fees payable etc. Efforts are on to prepare a national atlas of agricultural markets on a GIS Platform that would indicate the availability of entire marketing infrastructure in the country including storages, cold storages, markets and related infrastructure. Similarly commodity profiles indicating the post-harvest requirements of important commodities in terms of quality, packing, standards etc. are being loaded on to the portal.

Commodities already covered include Rice, Bengal gram, Red gram and mustard rapeseed.

Links

The portal has links with several Ministries and Central Institutions that are directly involved in implementing agriculture related programmes. The portal is also linked online with commodity exchanges, providing future prices in respect of cereals, oilseeds, etc. International price trends of agricultural commodities available on FAO website can also be acceded through the portal. The portal is constantly enriched by dissemination of information in regional languages.

Users

Price and other data reflected on the portal is being made use of by several agencies including Banks, Commodity Exchanges, Newspapers, Market Committees, Farmers' Organizations etc. Price information on the portal has credibility since it is generated by the Government system and acts as a reference point.

Technical Support

Technical support to the site is provided by a team of senior officers at the NIC Headquarters at Delhi, State coordinator at the NIC Regional Office and the NIC District Centers located in all districts of the country. Coordination with the State Governments is achieved through the State Marketing Boards under whose administrative control the State regulated markets function.

H. e-National Agriculture Market (eNAM)

Electronic National Agriculture Market (eNAM) is a pan-India electronic trading portal which networks the existing APMC mandis to create a unified national market for agricultural commodities. The eNAM Portal provides a single window service for all APMC related information and services. This includes commodity arrivals & prices, buy & sell trade offers, provision to respond to trade offers, among other services. While material flow (agriculture produce) continue to happen through mandis, an online market reduces transaction costs and information asymmetry.

Agriculture marketing is administered by the States as per their agri-marketing regulations, under which, the State is divided into several market areas, each of which is administered by a separate Agricultural Produce Marketing Committee (APMC) which imposes its own marketing regulation (including fees). This fragmentation of markets, even within the State, hinders free flow of agri commodities from one market area to another and multiple handling of agri-produce and multiple levels of mandi charges ends up escalating the prices for the consumers without commensurate benefit to the farmer.

e-NAM addresses these challenges by creating a unified market through online trading platform, both, at State and National level and promotes uniformity, streamlining of procedures across the integrated markets, removes information asymmetry between buyers and sellers and promotes real time price discovery, based on actual demand and supply, promotes transparency in auction process, and access to a nationwide market for the farmer, with prices commensurate with quality of his produce and online payment and availability of better quality produce and at more reasonable prices to the consumer.

e-NAM is being deployed in selected 585 regulated wholesale markets in States/UTs desirous of joining the e-platform. Small Farmers' Agribusiness Consortium (SFAC) is operating the NAM as the implementing agency with technical support from the Strategic Partner (SP). 400 mandis will be integrated by March 2017 and remaining 185 by March 2018. Department of Agriculture, Cooperation & Farmers' Welfare (DAC&FW) is meeting expenses on software and its customization for the States and is providing it free of cost. DAC&FW is also giving a grant as one time fixed cost subject to the ceiling of Rs.30.00 lakhs per Mandi (other than to the private mandis) for related equipment / infrastructure in 585 regulated mandis, for installation of the e-market platform. State Governments will suggest names of APMCs where this project would be initiated.

Components of e-NAM

A national e-market platform for transparent sale transactions and price discovery initially in regulated markets. Willing States to accordingly enact suitable provisions in their APMC Act for promotion of e-trading by their State Agricultural Marketing Board/APMC. Liberal licensing of traders / buyers and commission agents by State authorities without any pre-condition of physical presence or possession of shop /premises in the market yard. One license for a trader valid across all markets in the State. Harmonization of quality standards of agricultural produce and provision for assaying (quality testing) infrastructure in every market to enable informed bidding by buyers. Common tradable parameters have so far been developed for 25 commodities.

- Single point levy of market fees, i.e. on the first wholesale purchase from the farmer.
- Provision of Soil Testing Laboratories in/ or near the selected mandi to facilitate visiting farmers to access this facility in the mandi itself.
- M/s. Nagarjuna Fertilizers and Chemicals Ltd. is the Strategic Partner (SP) who is responsible for development, operation and maintenance of the platform.
- The broad role of the Strategic Partner is comprehensive and includes writing of the software, customizing it to meet the specific requirements of the mandis in the States willing to integrate with NAM and running the platform.

State's Obligations for Successful Implementation

In order to facilitate both - unification of market and online trading, it is necessary for the States to undertake reforms prior to seeking assistance under the scheme in respect of

(i) A single license to be valid across the State,

(ii) Single point levy of market fee and

(iii) Provision for electronic auction as a mode for price discovery.

Only those States/UTs that have completed these three pre-requisites will be eligible for assistance under the scheme. The States must ensure that the reforms are

carried out both in letter and spirit through appropriate and unambiguous provisions in the APMC Acts and rules. Besides the State Marketing Boards/APMCs must enable the promotion of the e-auction platform. The States will need to ensure that the mandis that are integrated with NAM makes provision for requisite online connectivity, hardware and assaying equipment.

Benefits of e-NAM

- NAM provides a number of benefits to various stakeholders of the system.
- For farmers, NAM promises more options for selling their produce and competitive returns.
- For local traders, NAM will provide access to larger national market for secondary trading.
- For bulk buyers, processers, exporters, NAM will enable direct participation in the local mandi trade, reducing intermediation cost.
- Stable prices and availability to consumer.
- For mandis, NAM benefits in terms of reduction in book keeping and reporting system, which are generated automatically;
- better monitoring and regulation of traders and commission agents;
- completely transparent system which eliminates any scope of intentional/un-intentional manipulation of tendering / auctioning process;
- improvement in the market fee collection by means of accounting all the transactions that are taking place in the market;
- reduction in manpower requirements as tendering / auctioning process takes place through the system; (this system helps to declare the winner for the lots within few seconds even for thousands of lots in the market);
- Analysis and forecasting of the arrivals and prices; availability of the activities of each APMC on the website directly.

I. Agricultural Extension: Role of Mobile Phones

Agricultural extension is an important means of enabling farmers to benefit from agricultural R&D taking the inventions and innovations to them. Its role becomes still more significant in a developing economy like ours that has low levels of literacy and high incidence of poverty, particularly in rural-areas. The low levels of socio-economic development indicators also limit the farmers' ability to derive full advantage from other sources of information, like newspaper and television, while underscoring the importance of interactive extension services to meet the informational needs of the farmers. The interesting question is whether the level, extent and quality of our extension services today through the public system meet the stated objective. The 59th round of NSS survey conducted in year 2003 reveals that only 40 per cent of farmers in India have access to modern technology for farming from any source of information. Access to 'modern technology for farming' means access to scientific information on hybrid-seed varieties, fertilizer-application, and plant protection, farm-machinery, harvesting, marketing and animal-husbandry. The survey further reveals that just 5.7 per cent of farmers have access to information from the extension workers. This clearly shows that the current number of extension workers is inadequate to meet the needs of farmers. Further, they do not reach most of the backward and remote areas that either lack proper connectivity or lodging facility or both. In addition, the government, due to budgetary constraints cannot increase its expenditure on extension services.

Our recent research reveals that the mobile phone is playing a very useful role in fulfilling the informational needs of farmers, particularly among marginal and small ones. The mobile-phone based agricultural information services like IFFCO Kisan Sanchar Limited (IKSL) and Reuters Market Light (RML), launched in some states in 2007 and 2008 are now swiftly becoming popular. These services, through SMS or voice-messages provide a variety of agriculture related information on crop-cultivation, fertilizer use, plant-diseases, pesticides, market-prices, weather and important government policy decisions. Various State Agricultural Universities and ICAR

professors have been co-opted in the expert panel of these service providers. The information is provided to farmers in local language, within a specified time and also two-way interaction through customer care centers is available. The farmers who have subscribed to these services have highlighted that they have now been more aware and have also enhanced agricultural earnings. The farmers who are not the subscribers but possess a mobile phone also revealed that the instrument has helped reduce costs and wastages and increased incomes. The popular uses of mobile phone in agricultural operations (when used just as a communication medium) included, getting to know the market-prices of crops at various places; receiving instantaneous solutions regarding seed-variety, fertilizer and pesticide availability/application n; calling distant livestock-doctors and so on. Significant saving in both time and money/fuel were reported by farmers on account of mobile communication. The research also provides evidence on the key role that mobile phones are playing in improving the information transfer between farmers and research institutions, government & private input companies, input-dealers, doctors, markets and other farmers.

Figure shows that a large percentage of mobile-phone owning farmers use it for accessing various types of agricultural information from different sources. Figure 2 highlights that the information received using mobile phone is rated "High" in importance by a large percentage of farmers. Mobile has started playing an increasingly useful role in the daily business of Indian farmers by providing them with much needed agricultural information related to modern farming techniques and market prices. The mobile based agricultural services are also getting enthusiastic response from the farming community and are also willingness to pay for these services. The regular feedback from subscribers help the service provider to further improve the service and information provided. They are developing new strategies to make the service more effective, such as including a camera facility that enables transfer of diseased plant's photograph to experts for better communication and efficient solution. Seeing the opportunities new players are

also planning to start operations. This situation underscores the existence of a big gap in our extension services, and the huge potential that mobile phones have in overcome

2.4 EXPERT SYSTEM IN AGRICULTURE

Note: An initial survey of a small group of farmers

An expert system is a software application that attempts to reproduce the performance of one or more human experts. Expert systems are mostly based on a specific problem domain, and are a traditional application of artificial intelligence. The expert system is used to behave like a human expert to solve the problem with the help of pre-set conditions in the software application. A wide variety of methods can be used to simulate the performance of the expert, which are:

Creation of "knowledge base" which uses some knowledge representation formalism to capture the subject matter experts' (SME) knowledge and

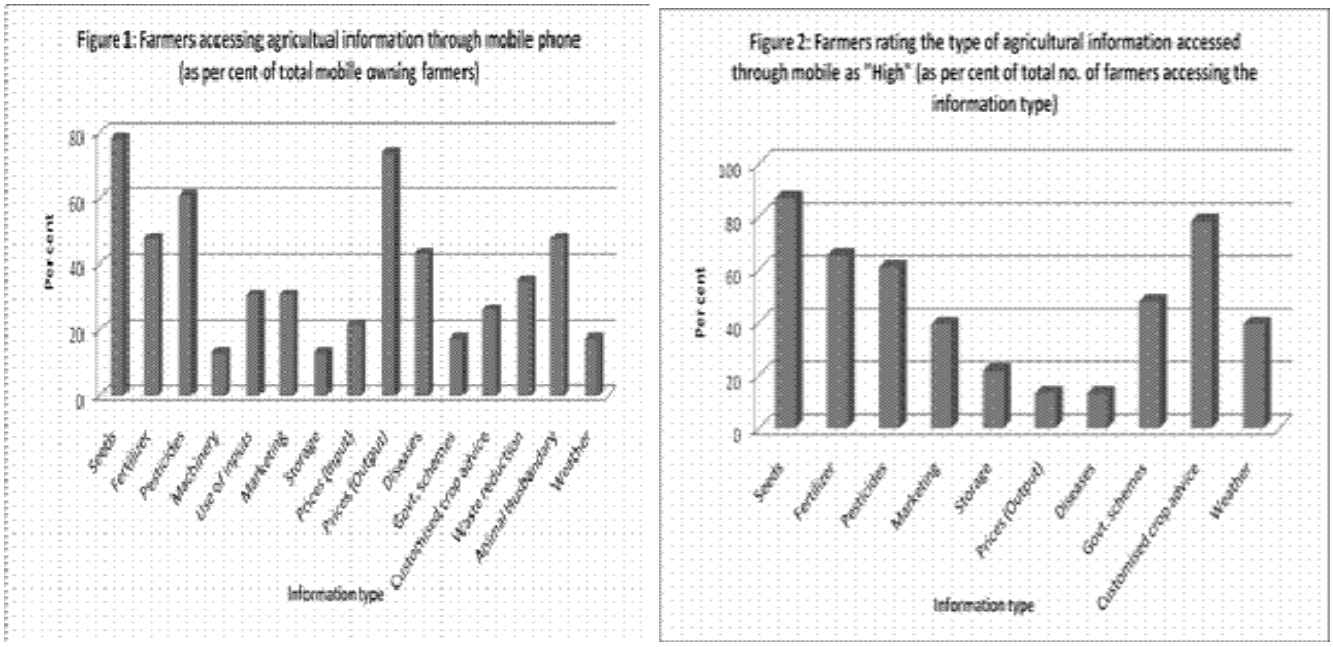


Fig 2.7 Knowledge base

(2) A process of gathering that knowledge from the SME and codifying it according to the formalism, which is called knowledge engineering.

Expert systems may or may not have learning components but a third common element is that once the system is developed it is proven by being placed in the same real

world problem solving situation as the human SME, typically as an aid to human workers or a supplement to some information system.

As a premiere application of computing and artificial intelligence, the topic of expert systems has many points of contact with general systems theory, operations research, business process reengineering, and various topics in applied mathematics, management science and also agriculture sector.

Expert systems, particularly in agriculture sector, can be used effectively to provide proper advice to the farmers in the area of nutrition management, pest control system, and selection of crop based on soil and water availability and many more.

The most common form of expert system is a computer program, with a set of rules, which analyzes information usually supplied by the user of the system about a specific class of problems, and recommends one or more courses of user action. The expert system may also provide logical or mathematical analysis of the problem. The expert system utilizes what appears to be reasoning capabilities to reach conclusions.

A related term is wizard. A wizard is an interactive computer program that helps a user solve a problem. Originally the term wizard was used for programs that construct a database search query based on criteria supplied by the user. However, some rule-based expert systems are also called wizards. Other "Wizards" are a sequence of online forms that guide users through a series of choices that matches with the user expectations or diagnosis.

Concepts and Importance of Expert Systems

The branch of computer science, known as Artificial Intelligence (AI), covers a number of different fields of application. Expert system is one such field that has attracted significant attention in recent years. Expert systems have been developed and applied to many fields such as office automation, science, medicine and agriculture.

Knowledge representation is an issue that arises in both cognitive science and artificial intelligence. In cognitive science, it is concerned with how people store and

process information. In AI, the primary aim is to store knowledge so that programs can process it and achieve the verisimilitude of human intelligence. AI researchers have borrowed representation theories from cognitive science. Thus, there are representation techniques such as frames, rules and semantic networks, which have originated from theories of human information processing. Since knowledge is used to achieve intelligent behavior, the fundamental goal of knowledge representation is to represent knowledge in a manner as to facilitate inference i.e. drawing conclusions from knowledge.

Knowledge engineers are concerned with the representation chosen for the expert's knowledge declarations and with the inference engine used to process that knowledge. A user can use the knowledge acquisition component of the expert system to input the several characteristics known to be appropriate to a good inference technique. These are:

- A good inference technique is independent of the problem domain.
- In order to realize the benefits of explanation, knowledge transparency, and reusability of the programs in a new problem domain, the inference engine must not contain domain specific expertise.
- Inference techniques may be specific to a particular task, such as diagnosis of hardware configuration. Other techniques may be committed only to a particular processing technique.
- Inference techniques are always specific to the knowledge structures.
- Successful examples of rule processing techniques are forward chaining and backward chaining.

Importance of Expert Systems

The complexity of problems faced by farmers are - yield losses, soil erosion, selection of crop, increasing chemical pesticides' costs and pest resistance, diminishing market prices due to international competition, and economic barriers hindering adoption of farming strategies. The farmer may not become expert manager of all these aspects of their farming operations. On the other hand, agricultural researchers need to address

problems of farm management and discover new management strategies to promote farm success. Numerical methods have failed to provide better solutions because understanding about crop systems are qualitative, based on experience and cannot be mathematically represented. Expert systems are computer programs that are different from conventional computer programs as they solve problems by mimicking human reasoning processes, relying on logic, belief, rules of thumb opinion and experience.

The experience and knowledge of scientist and SMS will be used to develop expert system on various issues of agriculture, which will be a handy advisory support system to the farmers.

In agriculture, expert systems are capable of integrating the perspectives of individual disciplines such as plant pathology, entomology, horticulture and agricultural meteorology into a framework that best addresses the type of ad hoc decision-making required of modern farmers. Expert systems can be one of the most useful tools for accomplishing the task of providing growers with the day-to-day integrated decision support needed to grow their crops.

Components of Expert Systems

Expert systems are composed of several basic components such as a user interface, a database, a knowledge base, and an inference mechanism. Moreover, expert system development usually proceeds through several phases including problem selection, knowledge acquisition, knowledge representation, programming, testing and evaluation.

User interface

The function of the user interface is to present questions and information to the user and supply the user's responses to the inference engine. The questions are mostly in the form of visuals that are developed as images, animation clips, and video clips. Any values entered by the user must be received and interpreted by the user interface. Some responses are restricted to a set of possible legal answers, others are not. The user

interface checks all responses to ensure that they are of the correct data type. Any responses that are restricted to a legal set of answers are compared against these legal answers. Whenever the user enters an illegal answer, the user interface informs the user that his answer was invalid and prompts him to correct it.

Knowledge base

The knowledge the expert uses to solve a problem must be represented in a fashion that can be used to code into the computer and then be available for decision making by the expert system. There are various formal methods for representing knowledge and usually the characteristics of a particular problem will determine the appropriate representation techniques employed.

The knowledge base is a collection of rules or other information structures derived from the human expert. Knowledge bases can be represented by production rules. These rules consist of a condition or premise followed by an action or conclusion (IF condition...THEN action). Production rules permit the relationships that makeup the knowledge base to be broken down into manageable units. Having a knowledge base that consists of hundreds or thousands of rules can cause a problem with management and organization of the rules. Organizing rules and visualizing their interconnectedness can be accomplished through dependency networks. The knowledge base can be used to good relational database management systems (DBMS) like Oracle, SQL Server, MySQL, Access databases to develop the rule base, and the query system can be used to retrieve the knowledge from DBMS systems.

Inference mechanism

The inference mechanism will be integrated as a software program (inference engine), the part of the program containing reasoning capability. It interacts with a knowledge base (IF…THEN…ELSE statements), which contains information about how to solve problems within the problem domain. This is the global memory where the knowledge based system records information relating to a specific problem that it is

trying to solve. Much of this information comes from the user but the memory is also used by the inference engine to record its own conclusions and to remember its chain of reasoning. By comparing what it knows about the problem domain in general with what it knows about the specific problem, the inference engine tries to proceed logically towards a better solution.

Inference rule

An understanding of the "inference rule" concept is important to understand expert systems. An inference rule is a statement that has two parts, an 'if-clause' and a 'then-clause'. This rule is what gives expert systems the ability to find solutions to diagnostic and prescriptive problems. An example of an inference rule is:

If the symptom of crop is X, Then the nutrition deficiency is Y.

An expert system's rule base is made up of many such inference rules. They are entered as separate rules and it is the inference engine that uses them together to draw conclusions. Because each rule is a unit, rules may be deleted or added without affecting other rules though it should affect which conclusions are reached. One advantage of inference rules over traditional programming is that inference rules use reasoning, which more closely resembles human reasoning. Thus, when a conclusion is drawn, it is possible to understand how this conclusion was reached. Furthermore, because the expert system uses knowledge in a form similar to the expert, it may be easier to retrieve this information from the expert.

The knowledge that is represented in the system appears in the rule base. In the rule base, described in the cross-referenced applications, there are basically four different types of objects, with associated information present.

Classes--these are questions asked to the user

Parameters- a parameter is a placeholder for a character string, which may be a variable that can be inserted into a class question at the point in the question where the parameter is positioned.

Procedures--these are definitions of calls to external procedures

Rule Nodes--The inference in the system is done by a tree structure, which indicates the rules or logic that mimics human reasoning. The nodes of these trees are called rule nodes. There are several different types of rule nodes.

The rule base comprises a forest of many trees. The top node of the tree is called the goal node, in that it contains the conclusion. Each tree in the forest has a different goal node. The leaves of the tree are also referred to as rule nodes, or one of the types of rule nodes. A leaf may be an evidence node, an external node, or a reference node. An evidence node functions to obtain information from the operator by asking a specific question. In responding to a question presented by an evidence node, the operator is generally instructed to answer "yes" or "no" represented by numeric values 1 and 0 or provide a value of between 0 and 1.

Advantages of Expert Systems

- Expert Systems are useful in many aspects and ready to use by end user as advisory system.
- Provides consistent answers for repetitive decisions, processes and tasks.
- Holds and maintains significant levels of information.
- Encourages human expert to clarify and finalize the logic of their decision-making.
- Never "forgets" to ask a question, as a human might.

Disadvantages of Expert Systems

- 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.
- Cannot adapt to changing environments, unless knowledge base is changed.

2.5 Application of Remote Sensing and GIS in Agricultural Development

Remote sensing:

Remote sensing is an important tool to provide important information on soils, land evaluation, land degradation, crop distribution, crop growth, availability of water resources etc. The information of Remote Sensing can be improved in its efficiency by combining with conventional technologies / ground surveys and also advanced tools such as GIS for analysis and interpretation.

Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their queries and helping in better decision making to implement planning activities for the development of agriculture.

Geographical Information System:

Geographical Information System can be used for scientific investigations, resource management, asset management, environmental impact assessment, urban planning, cartography, criminology, history, sales, marketing, and logistics. For example, agricultural planners might use geographical data to decide on the best locations for location specific crop planning, by combining data on soils, topography, and rainfall to determine the size and location of biologically suitable areas. The final output could include overlays with land ownership, transport, infrastructure, labor availability, and distance to market centers.

Global Positioning System (GPS):

The Global Positioning System (GPS) is a satellite-based system that can be used to locate positions anywhere on the earth. Operated by the U.S. Department of Defense (DoD), NAVSTAR (Navigation Satellite Timing and Ranging) GPS provides continuous (24 hours/day), real-time, 3-dimensional positioning, navigation and timing worldwide. Any person with a GPS receiver can access the system, and it can be used for any application that requires location coordinates. GIS helps people use the information that is collected from the GPS satellites.

The GPS system consists of three segments:

- The space segment: the GPS satellites themselves,
- The control system, operated by the U.S. military, and
- The user segment, which includes both military and civilian users and their GPS equipment.

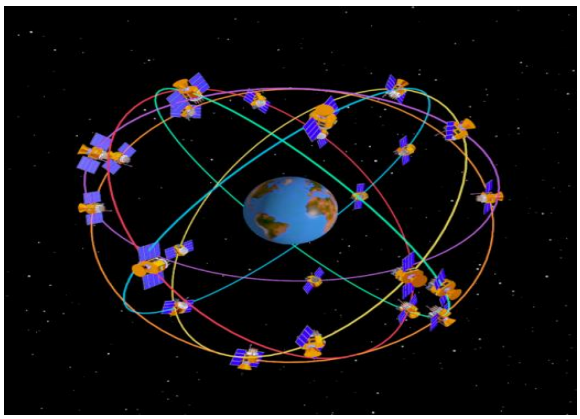


Fig 2.1 Global Positioning System (GPS)

Bhuvan

Bhuvan http://bhuvan.nrsc.gov.in/ is an online Geoportal launched by ISRO in 2009 and started by providing images and map visualization services of the Indian subcontinent. Since then, it has diversified into versatile viewing platform with capabilities such as providing 2D/3D photo-realistic textured pictures draped on image-based footprints providing a unique viewing/animation experience, full-fledged interactive thematic

services and free data downloads from NRSC Open Earth Observation Data Archive (NOEDA). More than 20,000 unique visitors logon to Bhuvan every month so far about 2,98,000 free products are downloaded by users across the globe.

Some of the States are using Bhuvan platform for specific applications. These are specific joint initiatives that address specific thematic applications in Agriculture, Forestry, Tourism, Geo-tagging and so on. One example is ENVIS program of Ministry of Environment, Forests & Climate Change which is actively using Bhuvan services. Similarly, "Bhuvan Panchayats" a Web Portal is facilitating decentralized planning at grassroot level. Designed to provide the information in spatial and non-spatial format for assisting the development activities of the local bodies in rural and urban areas, Bhuvan Panchayats provides information on various themes with high-resolution satellite images in the background. The portal also, provides the detailed information regarding household amenities data and Census Population data at district and village level respectively.

Application of RS and GIS in Agriculture

Crop Inventory

The intrinsic ability of spectral reflectance data to identify and distinguish crops is very helpful in deriving crop acreages, production estimates, to monitor and assess the crop condition. Remote sensing based crop identification and discrimination is centered on the concept that each crop has a unique spectral signature due to its growing period etc.; when two crops with similar spectral signatures occur in a given date, multi date data is required to identify them.

In India, the first systematic attempt for crop inventory through remote sensing technique was made under IRS utilization programme (IRS-UP). It was started by Indian Space Research Organization (ISRO) through three projects namely: (i) Crop Production Forecasting; (ii) Crop Yield Modeling; and (iii) Crop Stress Detection. Their successful demonstration at technique development stage led to formulation of Crop Acreage and

Production Estimation (CAPE) project under the Remote Sensing Applications Mission in 1986.

Crop Acreage and Production Estimation (CAPE)

Using single date cloud free optical data during the maximum vegetative stage of the crop growth, district level pre-harvest acreage and production of large area covering crops viz., paddy, wheat, sorghum, ground nut, rapeseed-mustard and cotton is being estimated on operational basis under the Crop Acreage and Production Estimation (CAPE) project. The remote sensing based acreage estimations are aimed to be made available at least one month before the harvest of the crop, meeting 90 / 90 accuracy criterion to enable the administrators and planners to take strategic decisions on import-export policy matters and trade negotiations. The crops covered were wheat, rice, cotton, mustard, sorghum and groundnut in their dominant regions using RS data along with ancillary ground and weather data. Under this project, an operational methodology and software package were developed. Scientists from State Remote Sensing Applications Centres and other participating agencies were trained in the use of analysis technique for crop production forecasting. The success of CAPE project led to demand by DAC for multiple in-season forecasts of major crops from sowing to maturity leading to formulation of FASAL concept.

Forecasting Agricultural output using Space, Agro-meteorology and Land based observations (FASAL)

Considering that crop forecast is needed right from the beginning of the season, when the crop is still being sown and effectiveness of different techniques with respect to crop stage, an integrated approach called FASAL was proposed. Accordingly use of econometric and weather based models is proposed early in the crop season. It will be followed by high temporal and moderate spatial resolution and later on high spatial resolution remote sensing data. Agro-meteorological conditions play a very important role in determining the crop growth and yield, hence they need to be considered at all the stages of the crop. Land based observations will be an important input for classification of remote sensing data, determining model coefficient for crop growth simulation model and validation of results. The acreage estimation in CAPE or FASAL can be done on sampling basis or by means of total enumeration approach. In the cases of estimation of crop acreages for large areas like states wherein analysis of large amount data and ground data collection are involved, stratified sampling procedure is being used operationally. The study area is divided into homogenous strata based on crop proportion and vigor as manifested on the satellite data and each stratum is subdivided into segments of required size usually 5 X 5 km. About 10-15 percent of the sample segments are randomly selected

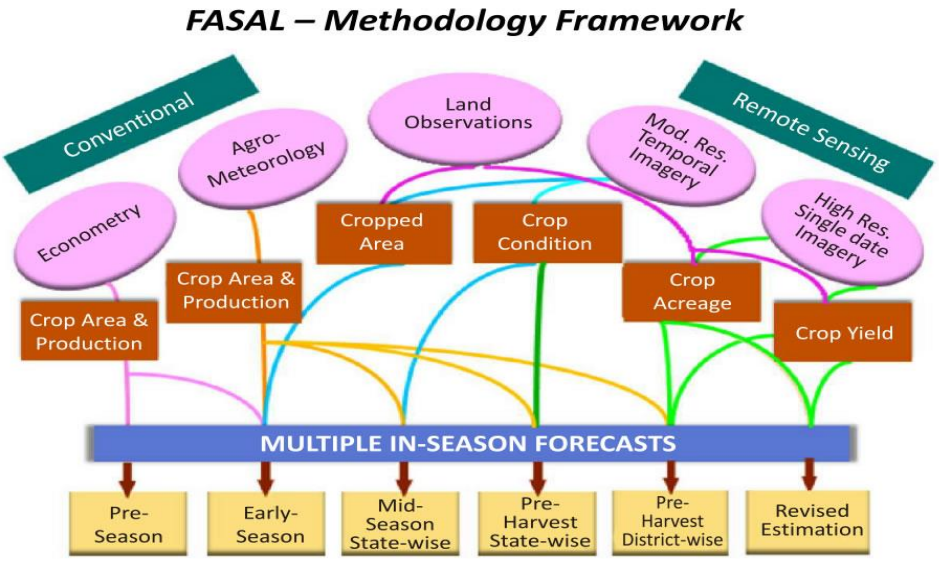


Fig 2.2 Conceptual framework of FASAL project

for digital analysis and standard statistical methods are employed to aggregate crop estimates at district / state levels.

The analysis can also be carried out for the entire area like district or taluq. The administrative boundary of the study area is overlaid on the image to extract all the pixels and the classification is run for the entire area to obtain the area of the desired crops. In this procedure district crop map showing spatial distribution of different crops can also be generated. Availability of better spatial resolution from IRS LISS-III enabled identification of crops, which are grown under multiple crop situations. Commercially important crops like chilies, tobacco etc., which are cultivated in small landholdings under intense input management practices can also be identified and their acreages can be estimated. Sugarcane is one crop where the industry has utilized the technology not only for area and yield estimation but also for finding out the suitable sites for expansion of area under cane crop.

Horticultural Crops

The high spatial resolutions LISS-III data also enabled identification of many horticultural crops viz., mango, coconut, oranges and banana. Mandal level acreages of mango crop of Krishna district and banana crop of Guntur district, Andhra Pradesh were estimated. Using satellite data, the area under Arecanut and grape were reported. The Ministry of Agriculture has recently started a nationwide program on horticulture crop inventory under the program "Coordinated program on Horticulture Assessment and Management" (CHAMAN) using geo informatics.

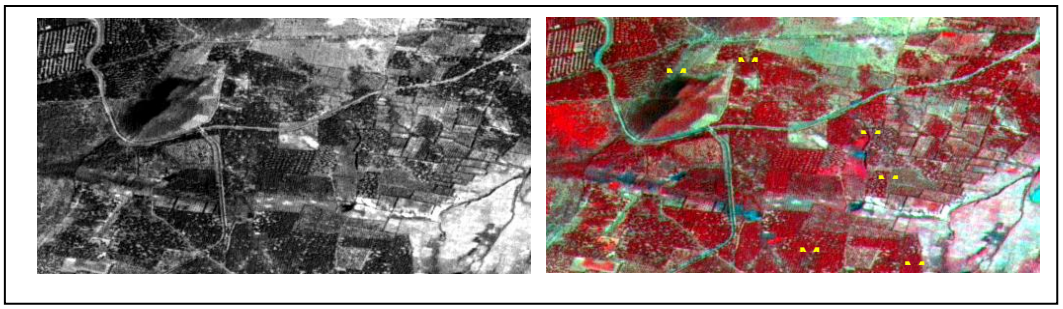


Fig. 2.8 IRS LISS-III and PAN merged data showing mango plantations

M= Mango plantations

Production Estimation

Crop yield is influenced by many factors such as genotype, soil characteristics, cultural practices adopted, metrological conditions and influence of pests and diseases. Spectral data of a crop is the integrated manifestation of the effect of all these factors. Development of reliable crop yield models with minimal data is a major thrust area. Statistical, meteorological and / or spectral models are used for crop yield estimation. Remote sensing based models adopt two approaches viz., single date spectral index and multi-date spectral index-growth profile. The single date data spectral index approach relies solely upon the data acquisition within a narrow critical period of maximum vegetation growth phase while multi-date approach depends spectral data at different stages of crop growth within the season.

The multi-date approach has the constraint of obtaining the cloud-free multi-temporal satellite data within the crop growth cycle. To overcome this problem, studies are in progress to explore the potential of the microwave data, which has the all-weather and cloud penetrating capability. Remotely sensed data directly or its derived parameters are related to the yield or to the biometric parameters. In addition, attempts are also underway to incorporate the spectral information in the process-based models and crop simulation models to improve the predictive capabilities of the remote sensing based crop production estimation.

Crop Monitoring and Condition assessment

Condition of the crop is affected by factors such as availability of water and nutrients, pest attack, disease outbreak and weather conditions. These stresses cause physiological changes which alter the optical and thermal properties of the leaves and bring about the changes in canopy geometry and reflectance / emission. Monitoring and assessment of crop condition at regular intervals during the crop growth cycle is essential to take appropriate curative measures and to assess the probable loss in production.

Regular monitoring of satellite data on crops at different phases of the crop growth would reveal any departure from normal growth, for inferring occurrence of any anomalies to incidence of pest and disease damage with the support of ground observations. In view of large area coverage in a short time and of repetitive nature, remote sensing techniques if used along with ground surveys,

can provide real time data for early detection and warning of out-break of the disease or insect damage before they reach higher severity levels.

National Agricultural Drought Assessment and Monitoring System (NADAMS):

In India, NADAMS was initiated towards the end of 1986, with the participation of National Remote Sensing Agency, Dept. of Space, Government of India, as nodal agency for execution, with the support of India Meteorological Department (IMD) and various state departments of agriculture. NADAMS was made operational in 1990 and has been providing agricultural drought information in terms of prevalence, severity and persistence at state, district and sub-district level.

In NADAMS, compositing of NDVI with maximum value approach for the period of 15 days and one month is being adopted. Drought assessment is carried out on fortnightly basis and reporting of information to the User departments is done on monthly basis. The assessment of agricultural drought situation in each district/block/taluk takes in to consideration the following factors-

Seasonal NDVI/NDWI progression (The Normalized Difference Vegetation Index (NDVI) is a simple graphical indicator that can be used to analyze remote sensing measurements. The Normalized Difference Water Index (NDWI) is known to be strongly related to the plant water content.) – i.e. transformation of NDVI/NDWI from the beginning of the season,

Comparison of NDVI/NDWI profile with previous normal years – relative deviation and vegetation condition index,

Weekly rainfall status compared to normal and

Weekly progression of sown.

The relative deviation of NDVI/NDWI from that of normal and the rate of progression of NDVI/NDWI from month to month gives the indication about the agricultural situation in the district which is then complemented by ground situation as evident from rainfall and sown area. The ground data from different states has been organized in to a data base along with satellite derived NDVI/NDWI data. Concept and basic details of drought assessment in NADAMS is depicted.

The variations in the progression of NDVI, in terms of the magnitude and rate of progression, in relation to its respective normal NDVI provide information of the prevailing status of the

vegetation. Exclusion of the permanent non-agricultural features like forests, wastelands, water bodies and settlements, reveal the status of the agricultural situation. In order to circumvent the problem of non-availability of cloud free optical data, time composited NDVI over an aggregated period of a fortnight or a month is generated, covering the entire crop growth season.

The analysis for agriculture drought warning started from June to August. Fortnight assessment carried out by using of NDVI, NDWI, VCI, Rainfall and Dry spell. The assessment divided into three categories viz. Normal, Watch and Alert.

June-August	Normal	• Agricultural situation is normal
	Watch	• Progress of Agricultural situation is slow • Ample scope for recovery • No external intervention needed
	Alert	• Very slow progress of agricultural situation • Need for intervention. • Develop and implement contingency plans to minimize loss

The analysis of agriculture drought warning started from September to October. Fortnight assessment carried out by using of NDVI, NDWI, VCI, Rainfall and Dry spell. The assessment divided into Four categories viz. Normal, Mild, Moderate and Severe.

September - October	Mild drought	• Crops have suffered stress slightly
	Moderate drought	• Considerable loss in production. • Take measures to alleviate suffering
	Severe	• High risk Significant reduction in crop yield • Management measures to provide relief

Fig 2.4 Mapping of Soil Resources with RS and GIS

In many applications of remote sensing in soils, understanding the principles of spectral reflectance of soils is fundamental and their limitation is crucial. The soil reflectance data can be acquired in

the laboratory or in the field and from air / space. In the laboratory the soil reflectance measurements are made under controlled conditions which they may enable to understand the relationship between the physical and chemical properties of soil and soil reflectance. In the field, reflectance measurements are made with the help of portable field spectrometers / radiometers and field soil spectroscopy will help in rapid point to point measurement of soil properties. However, the measurements are effected by variations in viewing angle or illumination condition and roughness factors. In the case of soil reflectance from air / space, the soil reflectance values can be obtained over a large area and reflectance can be studied in spatial domain. But factors like low signal to noise ratio and atmospheric attenuations, become critical. Nevertheless, information about soils from reflectance spectra in the visible (0.4 µm to 0.7µm), near infrared (NIR – 0.7 to 1.1µm) and short wave infrared (SWIR- 1.1 to 2.5µm) regions of electromagnetic spectrum (EMS) represent almost all the data the passive remote sensors can provide. Even thermal infrared regions (3 to 5 µm and 8 to 12 µm) also provide diagnostic information about soils. Spectrometers, radiometers and polarimeters provide quantitative measurement of reflected energy from soil and have found applications in studying the various aspects of soils as mentioned previously.

The most important soil properties that influence the reflectance are soil moisture content, texture, structure and iron oxide content. These factors are interrelated and, the spectral reflectance of soil is a cumulative property of combination of these factors.

The shape and nature of a soil reflectance curve depends upon the physical and chemical properties of soils. The important physical properties are soil colour, soil texture, structure, soil moisture, surface conditions / roughness etc. The chemical properties of soils result in absorption of incident radiation and is seen on reflectance curve as troughs whose positions are attributed to specific chemical groups in various structural configurations. It includes soil mineralogy, organic matter salinity, carbonates etc.

Soil color is mostly influenced by mineralogy, chemical composition, soil moisture, and organic matter content. It is an important parameter as it allows the diagnosis of soil types and their properties, as well as the detection of changes affecting ecosystems like erosion, salinization and/ alkalization. Several researchers observed that the visible and near infrared region are the most suitable spectral regions of EM spectrum for qualitative and quantitative description of soils.

Organic matter in soils has profound influence on soil spectral characteristics. The increase in organic matter has been found to result in a decrease in reflectance. The organic matter has effect on spectral reflectance of soils throughout the visible, NIR and SWIR region of EMS and many workers have studied organic matter extensively from a remote sensing point of view. The absorption features of reflectance spectra are related to functional groups in the organic matter and models were developed to predict the humus/ organic carbon content in soils.

Particle size or soil texture (refers to relative proportions of sand, silt and clay in soil) is another soil property that influences the spectral reflectance of soils significantly. Finer the particle size, the soil becomes smooth and more incoming energy is reflected. An increase in particle size causes a decrease in reflectance. However, silt content of soil is considered as major controlling factor for spectral reflectance. The spectral reflectance decreases with decrease in silt content. However, it is commonly observed that sandy soil exhibits higher reflectance than that of clayey soil, which is due to abundance of macro pores and air-soil interface. Under field conditions the soil structure (refers to arrangement of sand, silt and clay particles into aggregates) play a dominant role in altering the reflectance from soil.

Factors that contribute to change in aggregate size over a period of time are tillage, soil erosion, crust formation etc. Soil minerals viz., clay mineralogy and iron and iron oxides have significant influence on the spectral reflectance pattern of soils. In literature it is reported that an increase in iron oxide content in soils can cause decrease in reflectance, in visible wavelengths. Many of the absorption features in soil reflectance spectra are due to the presence of iron in one or other form and provide significant evidence on soil weathering process. Soils dominant in ferrous and ferric ions i.e. Limonite, Hematite and Goethite exhibit high response in the red region of spectrum.

Clay minerals are layered crystalline alumino silicate minerals, which are characterized by hydroxyl bands at 1.4 µm and 2.2 µm. Absence of appreciable amount of bound water in Kaolinite shows a weak band at 1.9 µm due to absence of appreciable amounts of bound water whereas montmorillonite shows very strong bands at 1.9 µm as well as at 1.4 µm. Quartz and feldspar show very high reflectance and the spectrum in the visible and near infrared is almost devoid of spectral features (such as absorption maxima denoted as bands) unless impurities occur. Carbonate response bands have been noticed at 1.90, 2.00, 2.16, 2.35 and 2.55 µm. Soils with Gypsic minerals have high reflectance because of the inherent reflectance properties of gypsum.

Satellite Remote sensing techniques are being operationally used to provide intra seasonal and inter-seasonal information on the spatial distribution of crops at different levels. The operational procedures have been developed for crops – rice, wheat, cotton, mustard, jowar, jute and potato crops under CAPE and FASAL projects. Time compositing techniques, applied for normalized difference vegetation index parameter circumvent the problem of non-availability of cloud free optical data and enable generation of the in situ crop condition information. The continuous improvements in the satellite technology in terms of providing improved spatial and spectral resolutions and re-visit periods will greatly enhance the capabilities of mapping and monitoring of crops, aiming towards sustainable agriculture.

2.6 LET'S SUM UP

The Information and Communication Technology can play a vital role in the agricultural information dissemination to the farmers and all other stake holders. This unit mainly focus on the how the e-Extension will helpful in information dissemination to the farmers with various technologies and ICT initiatives in the country. This unit also explores the use of Expert Systems for better use of advisory services on crop or crop related aspects by all the stakeholders of agriculture domain. At the end, a brief about application of Remote Sensing and Geographical Information Systems also incorporated for best utilization of the technology in agricultural development.

2.7 CHECK YOUR PROGRESS

1. e-Extension in Agriculture and Allied Sector takes help of the following tools

   a) Print Media b) Electronic Media

   c) Information and Communication Technology d) None of the above

2. What is the major objectives of NeGP-A?

   a) Bridging farmer centricity and service orientation to the programs

   b) Enhancing reach and impact of extension services

   c) Promoting a common framework of ICT applications in agriculture across states

   d) All these

3. Farmer portal provides information on

   a) Inputs b) Marketing c) Schemes d) All the above

4. mKisan is portal is used for sending agricultural and allied sector advices to farmers' mobile in the form of;

   a) SMS b) Voice Message c) Both

5. Kisan Call Center toll-free number

   a) 1800 180 101 b) 1800 180 108
   b) 1800 180 121 d) 1800 180 1551

6. GIS stands for

   a) Geographic Information System b) Generic Information System
   c) Geological Information System d) Geographic Information Sharing

7. Which of the following are full-fledged GIS packages

   a) QGIS b) Geo Media
   d) ArcGIS d) All of the above

8. Attribute data can be assigned to a point, line or area spatial features can be

   a) Numeric only b) Alphabets only
   b) Date d) All of these

9. Geo-stationary satellites are placed _____ away from earth.

   a) 900 KMs b) 36000 KMs
   c) 960 KMs d) 360 KMs

10. Applications of Geo Informatics in Agriculture includes

    a) Crop Inventory / Crop Monitoring identification b) Water logging areas
    d) Watersheds and Waste land development d) All the above

2.8 FURTHER READINGS/ REFERENCES

1. FAO-ICTs and Agricultural Services - ao.org/e-agriculture/blog/icts-and agricultural-extension-services

2. Farmer Portal – www.farmer.gov.in
3. mKisan Portal – www. Mkisan.gov.in
4. Bhuvan GIS Portal - https://bhuvan.nrsc.gov.in/
5. TNAU Agritech Portal – http://agritech.tnau.ac.in/