Animal Health Extension and Pastoralism

A module Prepared and Submitted to Wollega University, Collage of Medical and Health Science, School of Veterinary Medicine

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PREFACE

Currently Ethiopian higher institution curriculums are harmonized to a modular system which is ought to improve and maintain the quality of education. In newly opened institutions like Wollega University, who engaged in training of various Veterinary health professionals for which there is shortage of references materials, preparation of standard lecture notes and modules is indisputable. Therefore, with in the module of the curriculum, this lecture note was developed on the course "Animal Health Extension and Pastoralism" to fill the existing gap and strengthen the teaching -learning processes. The lecture note is primarily prepared for students pursuing their bachelor of veterinary medicine, doctor of veterinary medicine (DVM) or related professions in various higher teaching institutions. It also helps those graduates who are in service or specializing on the area. To develop this lecture note, materials have been gathered and adapted from different standard books, journals and research reports and adopted to the Ethiopian context. The lecture note has six chapters covering major and relevant topics of the course. Within each chapter, important topics are identified and discussed in simple language so as to facilitate rapid reading and understanding of important concepts. Each chapter has activity question and also followed by review questions that can enable the reader to use them as self-assessment tools. The authors strongly believe that this teaching material will play a crucial role in promoting the teaching-learning process through delivery of pertinent information to the trainees. Nevertheless, constructive comments and suggestions from readers are welcome so as to further strengthen the lecture note.

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ABREVIATIONS

CAHWS	Community based Animal Health Workers
CBPAHCS	Community Based Primary Animal Health Care System
DNLP	Draft National Land Policy
DVM	Doctor of Veterinary Medicine
EARO	Ethiopian Agricultural Research Organization
ILRI	International Livestock Research Institutes
MoA	Ministry of Agriculture
NGO	Non-Governmental Organization
OFT	On-Farm Trial
PAs	Peasant Associations
PRA	Participatory Rural Appraisal
RRA	Rapid Rural Appraisal
TAR	Technology Assessment and Refinement

CHAPTER-ONE

1. Introduction

The livestock extension education plays an important role to empower the farmers with appropriate technological knowledge and skills through various extension education and training programmes. This chapter briefs about livestock extension education with special reference to Ethiopia livestock farming situations. The concept of extension with a focus on livestock extension, development process and goals, extension approaches, communication and adoption of technologies and various livestock development programmes are discussed briefly for providing a holistic understanding of livestock extension education.

Learning objectives

At the end of this course, students should be able to:

- Describe the different extension teaching approaches,
- Describe the objectives and principles of animal health extension,
- Describe the RRA and PRA research methods,
- Understand principles of pastoralism or agro-pastoralism and pastoral production systems in Ethiopia,
- Identify the role of CAHWS in pastoral communities,
- Know different extension approaches fit to the pastoral conditions,
- To identify the challenges and opportunities associated with the development of pastoralist community.

1.1 Concept of Extension Education

James Stuart was considered as the father of University Extension for taking first practical steps and taking lectures to women's associations and working men's clubs in England in 1867-68. The term extension education was first used by Cambridge University in 1873, with an objective to take educational advantages of the university to ordinary people. After being influenced by

this, the Land Grant Colleges in the United States of America formally established the Agricultural Extension work by integrating different activities of the colleges.

The concept of extension is then it was spread to other parts of the world as well as to Ethiopia. The concept of extension was then applied to various fields depending upon the sector which is being addressed. This has led to the development of disciplines like agriculture extension, livestock extension, home science extension, fisheries extension etc. The word extension is derived from the Latin roots 'ex' meaning "out" and 'tensio' meaning "stretching". Extension education is stretching out to the people who are beyond the limits of educational institutions. Most definitions refer to extension education as an out of school education.

The National Commission on Agriculture Three (1976) refers to extension as an out of school education and services for the members of the farm family and others directly or indirectly engaged in farm production to enable them to adopt improved practices in production, management, conservation and marketing. Several authors defined extension in various ways emphasizing the importance of one or the other aspect of extension. According to Van den Ban and Hawkins (1996), extension involves the conscious use of communication of information to help people to form sound opinions and make good decisions. Extension is also defined as a professional communication intervention deployed by an institution to induce change in voluntary behavior with a presumed public or collective activity as indicated by Roling (1988). These definitions indicate that extension is for extending educational advantages, forming sound opinions to make good decisions and inducing changes in voluntary behavior.

The main objective of all extension work is to teach people living especially in rural areas how to raise their standard of living by their own efforts using their own resources of manpower and materials with the minimum assistance from Government. The broader function of extension work to help people to solve their own problems through the application of scientific knowledge is now generally accepted. Extension is largely educational in nature and approach. Hence, the words "extension" and "extension education" are used interchangeably. This is the type of education is to extend and to spread useful information to rural people. It is for rural people outside the regularly organized schools and class rooms. Its aim is to bring the desirable changes

in human behavior. It is closely related with the development of the ability of the farmer's understanding and adoption of new technology. The farmers need to be supplied with recent, useful and practical information. Rural people should know and adopt useful research findings from time to time and transmit their problems to researchers for education. There are links in the chain of rural development: research institutions, extension organizations and efficient communication between researchers and farmers.

Activity 1.1

1. What is extension?
2. What does extension education mean?

1.2 Types of Education

There are three basic types of education

1. **Formal education**: The teacher starts with theory and works up to practical; students study subjects, and must adapt themselves to the fixed curriculum offered, authority rests with the teacher class attendance is compulsory. Teacher instructs the students, teaching is only through instructors which mainly vertical, teacher has more or less homogeneous audience and more theoretical. A type of education which is an institutional activity, uniform, rigid, full time, structured, subject oriented and leading to certificates.
2. **Informal education**: Not Uniform, flexible, part-time, unstructured and learn-oriented.
3. **Extension education**: The teacher starts with practical and may take up theory later on farmers study problems, it has no fixed curriculum /course of study, authority rests with the farmers and participation is voluntary, teacher teaches and learns from the farmers, teaching is only through local leaders and is mainly horizontal, teacher has a large heterogeneous audience and flexible, it is more practical and intended for immediate application to the problems. A science, it deals with the creation, transmission and application of knowledge designed to bring about planned changes in the behavior of the people with the view to help them to live better live standard by learning the ways to improve their farm, home and community situation.

1.3 Elements of Extension Education

There are five elements of extension education process

1. **Analysis of the situation:** Analysis of facts are needed about the people, their interests, education, social customs, habits, folkways/old customs and about types of farming, marketing, size of holding and communication, transport facilities, and others problems of organizations as well as resources available with the organizations.
2. **Deciding upon objectives:** It enables the people to select limited number of problems, state their objectives clearly, the solutions to be offered has to give satisfaction and the objectives should express the behavioral changes in the people/social or economic outcomes which are desired.
3. **Teaching plan of work:** Involves contents to be taught, methods and techniques of communications in order to create learning situation, the ability to choose and use those methods better adapted to particular objectives and it is the measure of an extension worker's effectiveness.
4. **Evaluation:** This determines what extent objectives have been reached, also testes of how accurately and clearly, and the objectives have been stated. The process of evaluation may be simple/complex and informal/formal.
5. **Reconsideration:** Review of previous efforts and results which reveal a new situation. If this new situation shows the need for further work, the whole process may begin again with new or modified objectives.

Activity 1.2

1. What is the difference between formal and extension education?
2. Mention the elements of extension education?

1.4 Objectives of Extension Education

Extension is education and its aim is to bring the desirable changes in human behavior. Education should be conceived as a lifelong process of learning. Extension education is an education that is desired for rural people outside the regularly organized schools and class rooms

for bringing out social and cultural development. Extension means to extend/spread useful information and ideas to rural people.

Thus, the objective of extension is to raise the standard of living of the rural people by helping them in using their natural resources like land, water and livestock in the right way. Rural people are helped in planning and implementation of their family and village plans for increasing agricultural production, improving existing village industries. It should also help in providing minimum health, educational and housing facilities for improving family living conditions in the village.

The specific objectives of animal health extension are given here:

1. To develop the people,
2. To disseminate the useful and practical information relating to animal health, including improved husbandry, health, vaccine delivery, deworming, and improved health care practices.
3. To apply practically the useful knowledge to farm and house,
4. To help the members of the farmer's family to a larger appreciation of the opportunities, the beauty and the privileges of rural life and to know more about the environment in which they live,
5. To improve all aspects of the life of the rural people within the framework of national, economic and social policies involving population as a whole.

1.5 Basic Principles of Extension Education

Principles are the specific guidelines or the base for any decision making process or initiating an action. The principles are the guiding force behind any work. In the history of extension work, there are certain general principles of extension education which have been applied and tested. These principles have more or less general application. Thus, the extension work is based upon these working principles and the knowledge of principles is necessary for an extension worker. The widely accepted principles of extension education which are related to animal health extension are given hereunder with brief explanations.

A. Principle of interest and need

Extension work must be based on the needs and interests of the people. These needs and interests differ from individual to individual, from village to village, from block to block and from state to state and therefore, there cannot be one programme for all people. The rural people should voluntarily participate in the extension work. To be effective it should start from the interests and need of the rural family. The extension education should fulfill these needs of the people and create interest among them for extension programmes. Many times the needs of the people and extension programmes are quite different. Sometimes, the extension workers clearly see the important needs of the community but the people hold some other needs to be more important. In such cases, the extension\worker should give priority to the felt needs of the people. While doing this, he/she should create an atmosphere of confidence, which would help in converting the unfelt needs of the people into the felt needs in future.

B. Principle of cultural difference

In order to make the extension programmes effective, the approach and procedure must be suited to the culture of the people who are taught. In a vast country like Ethiopia, there is a lot of difference in the culture and thinking between people of different states. Different cultures need different approaches. The extension worker has to recognize this difference between different cultures and use it in increasing effectiveness of his/her work. Improvement can only begin from the level of the people where they are at the beginning of extension education. This means that the extension worker has to know the level of the knowledge and the skills of the people, methods and tools used by them, their customs, traditions, beliefs and values before starting the extension programme.

C. Principle of cultural change

The culture of people undergoes change while doing extension work. There will be change without extension work also, as change is necessary for the growth and development of society. To change the behavior of the people through extension, the extension worker should gain the

confidence of the rural people. They should believe that what the extension worker says has relevance to their daily life. To start with, the extension worker should demonstrate the beneficial results of the useful ideas on the fields of some farmers so that they will have faith in him. Those who see the demonstrations would tell others and all of them could realize that the extension worker has really something useful to contribute. They would discuss their difficulties with the extensive workers. The level of education of the people would rise from such simple events. First, the extension worker has to help the farmer in increasing his yields and then he/she can concentrate on proper marketing of these increased yields. Depending of the changes in the needs of rural people, the extension worker has to change his area of work.

D. Principle of participation

Extension helps people to help themselves. Good extension work helps the rural people in identifying their problems. It is directed towards assisting rural families to work out their own problems rather than giving them ready-made solutions. Many things are learned while doing a particular work. Actual participation and experience of people in these programmes creates self confidence in them. If the people participate in any project, they develop a sense of belonging towards that project. This also develops leadership in the village and extension worker can obtain participation of the people by requesting the social leader to preside at a meeting. The leadership qualities are developed in rural people, if they participate in extension programmes. Confidently they come forward to undertake future programmes.

E. Principle of adaptability

People differ from each other, one group differs from another group and conditions also differ from place to place. An extension programme should be flexible so that necessary changes can be made whenever needed, to meet the varying conditions. People differ in their level of understanding and knowledge; therefore, only one extension method will not be of use in providing information to all. Written material will be of use for those who can read it, meetings will be of use for those who can attend them and demonstrations will be of use to those who see them. Research shows, that the use of more than one extension method carries the message

effectively to the people. New methods must also be devised to meet new situations and changing conditions.

F. Principle of grass-root organization

For extension work to be effective and real, it has to be a synthesis of democracy obtained at the level of family and more particularly at the village level. Different groups work in rural communities. Extension programmes made based on the interests and needs of the people would give better results. For a higher level of living, corresponding organizations of different professions should be developed at the village level.

G. Principle of leadership

Extension work is based on the full utilization of local leadership. After identifying the local leaders, they should be trained and encouraged to do extension work. Many people never had any ability in this direction until extension workers gave them the opportunity. The selection and training of local leaders to enable them to help to carry out extension work is essential to the success of the programmes, Extension worker should utilize these leaders for increasing the speed of extension work. People have more faith in local leaders and they should be used to put across a new idea so that it is accepted with least resistance.

H. Principle of whole family approach

Extension work will have a better chance of success if the extension workers have a whole family approach instead of separate and un-integrated approach. Extension work is therefore, for the whole family i.e. for male, female and the youth. The family is the unit of any society. All the members of the family should be equally involved in the extension programmes. It creates mutual understanding. If the extension worker neglects one member of the family, there is a possibility of the rejection of the innovation.

I. Principle of co-operation

Extension is a co-operative venture. It is a joint democratic enterprise in which rural people co-operate with their village, block and state officials to pursue a common cause. The idea behind the extension work is the coming together of the rural people and the extension workers for social up-liftment. The extension programmes should be the people's programme with government aid. All should cooperate and help each other for this taste of social up-liftment.

J. Principle of satisfaction

Satisfaction is the key to success in extension work. A satisfied customer is the best advertisement. The end product of the effort of extension teaching is the satisfaction that comes to the farmer and his family as the result of solving a problem meeting a need or acquiring a new skill. Thus, the development programmes should lead to the satisfaction of participants. If people are not satisfied by participating in the programme they will not participate in the future. Recognition and appreciation for work well done encourages voluntary leadership.

K. Principle of evaluation

Extension is based upon the methods of science and it needs constant evaluation. The effectiveness of work is measured in terms of the changes brought about in the knowledge, skill, and attitude and adoption behaviour of the people but not merely in terms of achievement of physical targets. Extension work is educational in nature and therefore, its effectiveness should be measured by measuring the changes in people. It is necessary to review the development made so far to see whether the extension work is proceeding in the right direction. If not, it is necessary to take corrective measures. The results of evaluations would help the extension workers in improving the quality of the programmes in the future.

L. Principle of learning

In extension work, farmers should be encouraged to learn new things by doing and by direct participation. Farmers hesitate to believe until they see the proof. The motive for improvement must come from the people and they must practice the new ideas by actually doing them. It is learning by doing which is most effective in changing people behaviour and developing confidence to use the new methods in future.

M. Principle of trained specialists

Like other sciences, agriculture is also improving rapidly, in all aspects. Therefore, maintaining competency in anyone of these fields is a continuous job. It is very difficult for a multi-purpose extension worker to keep himself abreast with all the latest findings of research he has to deal with in his day-to-day activity.

Trained specialists have to be provided, who keep themselves in touch with their respective research stations or institutes and extend to the extension worker, the latest scientific developments, which have scope for adoption in particular areas. If there are no trained specialists behind the extension work then extension cannot thrive. These specialists are the link between research and application of research on farmers' fields. They have the responsibility of solving the problems of the extension workers in their subject. The subject matter specialists should have a broad outlook and he should know other related fields so that he can deal with the problems of the farmers and give suitable solutions and guide lines.

O. Principle of applied science

Applied agricultural science is not a one-way process. The problems of the people are taken to the scientists who do the experimentation necessary to find out the solutions. The extension worker translates the scientific findings of the laboratories in such a way that the farm families can voluntarily adopt them to satisfy their own needs.

P. Principle of democratic approach

However, extension work is democratic and aims to operate through discussion and suggestion. Facts about a situation are shared with the people. All possible alternative solutions are placed before the participants, and their merits are highlighted through mutual discussions. Ultimately, the people are left free to decide their line of action, the methods to be adopted in the local situation with their own resources and available government assistance.

The extension education philosophy is based on the hypothesis that rural people are intelligent, are interested in obtaining new information and at the same time have a keen desire to utilize this information for their individual and social welfare. The basic philosophy is directed towards changing the outlook of man by educating him. Its primary aim is, therefore, to transform people by bringing about desired changes in their knowledge, attitudes and skills.

Extension Educational Process: Extension education is a process and it is participatory in its approach. According to Leagans the sequences of steps involved in the process are

(i) Situation analysis
(ii) Formulation of objectives
(iii) Deciding the content and teaching methods
(iv) Outcome evaluation and impact analysis and
(v) Feedback and formulation of corrective action. In this way the continuous process of extension education goes on resulting in progress of the farmers from a given situation to a desirable situation.

Effective Teaching Learning Situation: Teaching in extension education reflects the philosophy of change in knowledge, skills, attitudes, values, beliefs and understanding. It is the process of arranging situation that initiates and facilitates the learning activity among the learners towards the goal that brings about the desirable changes in their behavior. Leagans defined teaching as the process of arranging situation in which the important things to be learnt are called to the attention of the learners, their interest developed, desire aroused and action promoted. The teaching learning process is usually explained with the help of the following six steps:

Attention: Bringing attention of the learner is the first and foremost step in the teaching learning process.

Interest: Once the learners‟ attention is focused next responsibility of the teacher is to arouse the interest in the learner towards the subject matter.

Desire: Once the interest is created the teacher has to sustain the interest and stimulate the learner to convert the interest into desire.

Conviction: The action followed when desire, conviction and satisfaction of the learners is achieved. Therefore, the teacher should see that the learner knows what action is necessary and just how to take that action. He also should help the learner to visualize the action in terms of his own situation and gets confidence in his ability to apply the things by himself in practice.

Action: In this step the conviction is converted into action and the job of the teacher is to make his student act in the lines of the knowledge acquired. Action means implementation in the actual situation.

Satisfaction: The end product of the teaching effort is the satisfaction that comes to the learner as a result of solving the problem, meeting a need, acquiring a new skill or some other change in behaviour. The goals of learning are achieved through accomplishment of the learner in applying the knowledge and achieving satisfaction out of the results.

Learning is a process through which the learner gains knowledge or by which he changes his behaviour through his own effort and experiences. Learning occurs out of the application of knowledge gained by the learner and through his own experience. Research revealed that people tend to remember 10 % of what they read, 20 % of what they hear, 30 percent what they see, 50 percent of what they hear and see, 70 percent of what they say and 90 percent of what they say and do. An effective learning situation comprises of all the essential elements such as **teacher, learner, subject matter teaching materials and physical facilities**. Therefore, an effective learning situation is a system with structurally and functionally interacting sub systems or elements. The learning situation must be effective in enabling the learners to acquire the knowledge, improve or learn skills, develop positive attitudes finally leading them to take appropriate decisions. Extension being an applied science must focus on field practical to help livestock owners to improve their knowledge and acquire skills to enhance the production of their animals.

Activity 1.3

1. What are the basic objectives of animal health extension?
2. Discuss about the principles of leadership and principles of satisfaction?

1.6 Communication in Extension and Its Approaches

Communication: The most important challenge in communication of livestock technologies is to find out ways and means to convey the messages to the livestock farmers in an effective manner which enable them to take appropriate decisions on adoption of the technologies. To meet this challenge, it is important to understand the communication process, extension teaching methods, audio visual aids and their usage for effective communication.

There are several models to explain the concept of communication. There are six important elements involved in the communication process. There are six key elements of communications. Brief meanings of the key elements are as follows.

1. **Communicator**: is the person from whom the message originates.
2. **Message**: is the information or the meaning the communicator wants to convey.
3. **Channel**: is the media through which the communicator sends/conveys his message.
4. **Audience**: is the receiver of the message or to whom the message is sent.
5. **Feedback**: gives the details about audience response to the given communication process.
6. **Effect or Impact**: In extension education the element „effect" can be called as „impact". It is the end result of the communication. It is the change that has taken place with the receiver due to the communication.

Barriers to Effective Communication: The following are some of the common problems which come in the way of effective communication:

1. Lack of planning
2. Unclarified assumption (s) of the sender
3. Semantic distortion

4. Badly expressed message
5. Loss by transmission
6. Poor listening and premature evaluation
7. Fear, distrust and threat
8. Insufficient adjustment period to change
9. Biasness of the communicator.

1.6.1 General extension approaches

Livelihood Approach: It is very well documented that livestock provided livelihood security to at least one fourth of our population.

Group Approach: The Extension approach needs to be changed from individual to group mainly because the decision making is shifted from individual to groups of producers. The development of sustainable farming practices often requires **collective** decision making, whereas extension in the past mainly supported **individual** decision making.

Market Driven Approach: It is being clear now that the adoption of technologies is market driven rather than technology driven. With the available technologies, it is not a problem to produce milk, chicken, meat, eggs or wool but it is very difficult to market these products due to lack of proper marketing infrastructure. Procurement, transportation and sale of livestock products are more difficult and complex than producing them.

Entrepreneurial Development Approach: It is well known that some farmers have got entrepreneurial abilities which enable them to try new methods of farming. Such entrepreneurs who are usually described as innovators exist in almost all social systems and skill of the extension personnel lies in identifying as well as encouraging such people to enter into new ventures of livestock development. The experiences of these pathfinders could be profitably utilized to upscale for wider use. It is necessary to identify such entrepreneurs, prepare success stories and give wide publicity through various mass media channels to enable the interested people to emulate them.

Participatory Approaches: Of late it is very well recognized that the farmers are considered as partners in development rather than as end users of technology. Evidence supports that it is beneficial to involve the livestock farmers in developing, adopting and evaluating the technologies. Many of the extension programmes were not successful due to poor participation of farmers.

Multi-Disciplinary Approach: with the realization that the problems in the field are usually multi-dimensional which requires the expertise of different fields of knowledge, emphasis is being given to multidisciplinary approach in formulating as well as implementing the research projects. The livestock extension issues revolve around livelihood, livestock, women, social groups, markets, economics of production, policies etc.

Farming Systems Approach: Farming System Approach replaces the conventional single discipline based, commodity oriented approach. The farming system approach considers the farm, the farm household and off-farm activities in a holistic way to take care not only of farming but also all aspects of nutrition, food security, sustainability, risk minimization, income and employment generation which make up the multiple objectives of farm households.

For communicating an idea, experience or technology, extension worker use audio-visual aids because audio-visuals help to communicate the message effectively and efficiently. Audio-visual aids are just tools or aids or vehicle for transfer of ideas, technology or message. The success depends upon the selection of right type of audio-visual aids at the right way. The materials that can be used for extension teaching and communication vary based on the type of technology, type extension approach, the economic status of the country, the sociocultural, available infrastructure and facility. The materials that can be used for animal health extension is described in chapter three.

Activity 1.4

1. Discuss the entrepreneurial development approach in livestock education?
2. Put the baseline between participatory and multi-disciplinary approaches?

1.6.2 Extension teaching methods

Teaching methods may be defined as the devices used to create situations in which communication can take place between the instructor and the learner. An understanding of different extension teaching methods help the teacher to select an appropriate method which suits his subject matter to be delivered and the type of audience involved in the learning process. It is, however, understandable that every method has certain advantages and disadvantages and there is no one single method which suits all the situations. Research indicates that aids used in combinations are always better than any one type of aid used alone.

Classification of Extension Teaching methods: The extension teaching methods are classified into different methods based on the use and form. The detailed list is provided below (Figure 1):

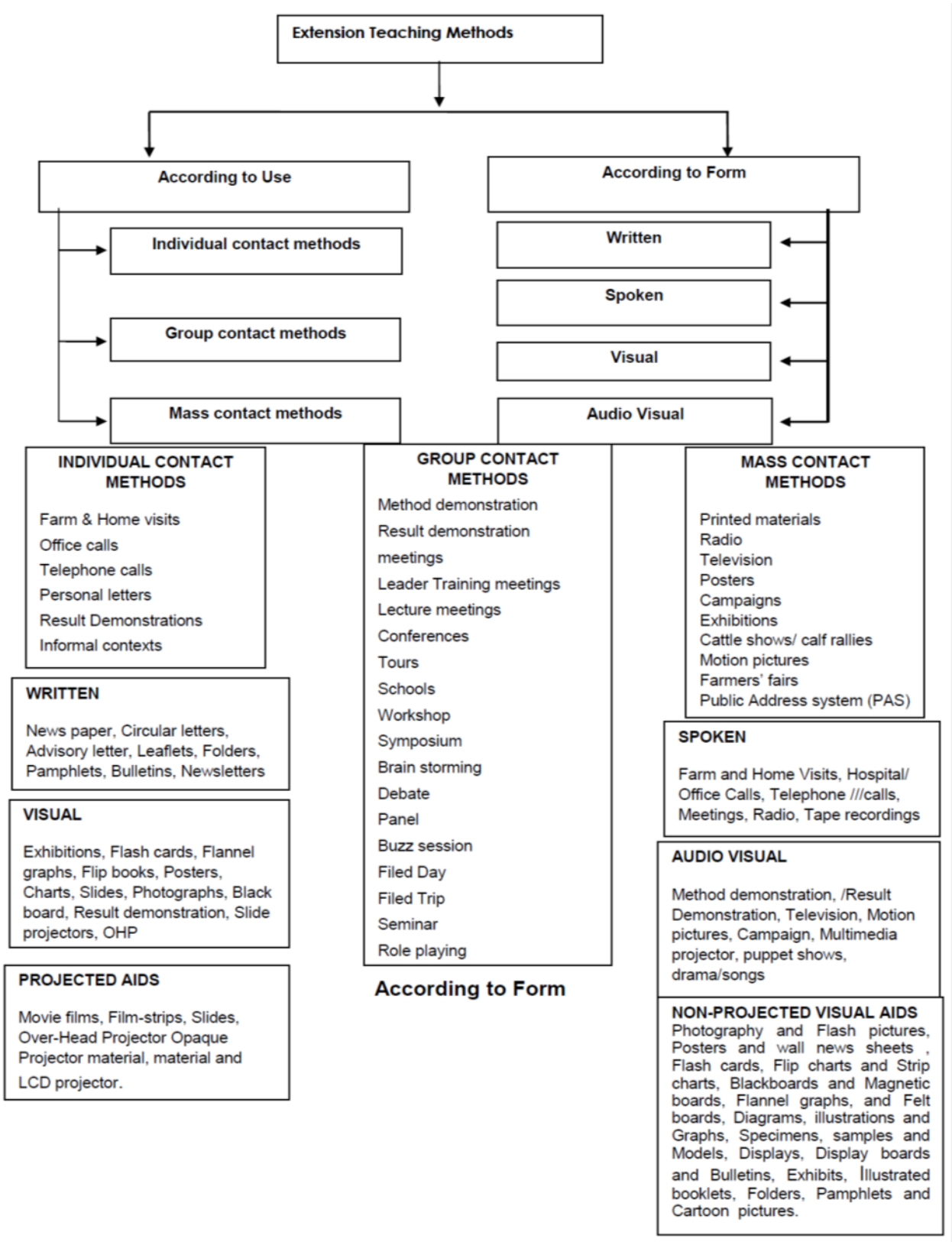

Figure 1. Classification of extension teaching methods

Methods and Aids commonly used in Livestock Extension

Context/Method	Teaching aids
1. Hospital/Dispensary calls	Individual interviews Posters Leaflets/folders or other printed media Flip books ICTs
2.Farm visit/Home visit/ House calls	Individual interviews Leaflets/folders
3.Village seminars (self help groups, cooperative societies, Banks, other development departments**)**	Lecture Flip books/flash cards Panels/exhibitions Leaflets/folders
4.Demonstrations	Leaflets/folders/booklets
5.Campaigns	**Different methods** Radio, TV, PA systems, Megaphone, notice bits Exhibitions Examination of dung sample (deworming campaign) Leaflets
6.Training on scientific livestock rearing	Chalkboard Video Overhead projector Multimedia projector, Training manual, Booklets/pamphlets, Flip books, Feed back cards
7.Group meetings	PRA/RRA for need analysis Chalk boards

Figure 2. Extension teaching methods and aid commonly used in livestock extension

The ideas or new technologies generated or evolved in the research institutions are transferred or communicated by the extension workers by spoken word or the picture word or a combination of both. They establish direct contact with the farmers in person, in group or through indirect media. The role of extension agent is not limited to communication with livestock owners. As a potential link between research institutions and livestock owners the extension agent must have good skills in effectively communicating with various stakeholders which include policy makers, researchers, input suppliers, market agents, credit institutions etc. For better communication of ideas or technologies extension workers have to use the combinations of teaching methods, and audio-visual aids as visual and auditory senses together aids a faster learning.

Why use of Audio-Visuals?

For communicating an idea, experience or technology, extension worker use audio-visual aids because audio-visuals help to communicate the message effectively and efficiently. Although providing direct contrived experience to the learners is ideal to create an effective learning situation, it may not be possible every time to do so because of various limitations. Hence the effort is to bring the learners very close to direct experience by using appropriate visuals or audio visual aids. They provide the audience with a situation nearest to the reality and readily get the idea. Visuals help to give correct initial concepts by giving true mental impressions. For this purpose, extension workers take the audience to demonstrations, pictures, photographs, slides, models, specimens, movie films, film-strips, puppet-shows, television etc. These audio-visual aids help to make out the meaning of the spoken words clear as the ideas or information are put across through more than one sense. Research showed that the use of visual aids help people to learn faster and better than by verbal method, alone.

The audio-visual aids help to create a favourable learning situation through facilitating teaching learning process. The learning will be effective when the dairy farmers were shown the milking machine and it will be more effective when they were taught how to use it and much more effective when they were allowed to practice on using it. If it is not possible to show the machine (direct exposure) the extension agents have to rely on pictures (less effective), films or multi-

media projector (more effective). But none of these aids can either replace the teacher nor will they be as effective as direct experience.

Each type of audio-visual has certain advantages as well as limitations. All are needed at one time or the other to induce audience in the adoption process. Audio-visuals in combinations are always better than any one type of aid used alone. With the advancements in printing technology and electronics some of the aids are becoming obsolete. A list of aids that are currently in use is given in table 1.

Table 1. List of Aids currently in use

Aids getting replaced or becoming obsolete	Aids currently in use
• Wall posters	• Digital cut outs, banners, collapsible banners
• Slide projector	• Multimedia projector
• Black board	• White marker board
• 16 mm film projector / film strips	• Multimedia projector
• Epidiascope	• Direct projector
• SLR camera	• Digital camera
• Radio	• TV
• VCP/ VCR	• CD player
• Telephone / land line	• Mobile phone
• Personal letters	• E mails
• Two dimensional pictures	• Three dimensional pictures
• Meetings/ discussions	• Audio/ Video conferencing

Choice of Audio-Visual aids

Audio-visual aids are just tools or aids or vehicle for transfer of ideas, technology or message. The success depends upon the selection of right type of audio-visual aids at the right way. There is no inherent magic in the visuals. They have to be used in support of a talk for highlighting the

most salient feature in the talk to make the audience to understand and remember. They are only aids to verbal words of the communicator. Audio-visual aids are not necessary for each and every type of communication. For example, there are ideas simple enough that can be easily communicated through verbal words. Audio-visuals are therefore need to be used judiciously for subject matter that is beyond easy comprehension of the audience or out of their experience or abstract enough or complicated enough for their easy understanding. It is only then that audience will have a sustained interest for learning through audio-visual aids.

While planning for the use of audio-visual aids the extension agent need to be selective in using the aids taking into consideration different factors like the audience (age, sex, level of literacy, previous experience etc.), availability and cost of equipments, familiarity of extension agent with the equipments, facilities required for use of the aids, subject matter etc. Above all it also depends upon the objective or purpose of the communication. Literature Literature is write ups or written materials about an idea or a thing. In extension teaching literature plays an important role in the message dissemination process. Some of the common literature, that forms the part of extension teaching learning process are, leaflets, folders, pamphlets, bulletins, circulars, newspapers, magazines, journals and newsletters. The literature serves the purpose of communicating precise and reliable scientific information in a simple and easily understandable language to a common man. A brief explanation of various literature used in extension are given below.

Technology Adoption and Consequences

The adoption of recommended technologies depends upon the perceived technological characteristics (Rogers, 2003). The user system evaluates the suitability of the technologies based on the factors such as (i) relative advantage of the transferred technology over the existing practices, (ii) the suitability or compatibility of the technology to their system, (iii) the degree of technological complexity in integrating it in their existing system, (iv) the possibility of testing the technology on trial basis in a limited way before the large scale adoption and (v) observability of the relative benefits over the adoption of the technology in their system. For example, the technologies related to disease prevention and control has got a limited

observability of the benefit by the farmers resulting in farmers‟ reluctance in vaccinating their cattle (Table 2). It is well recognized that those technologies with high perceived relative advantage, compatibility, trialability, observability and predictability are adopted immediately whereas complexity of the innovation is negatively related to its rate of adoption.

Table 2: Perceived Technological Characteristics

Sl. No.	Perceived Technological Characteristics	Description/ Example
1.	Relative Advantage	Dairy farmers consider cross bred cows produce more milk than indigenous cows. Similarly they consider the crossbred bullocks are inferior to local bullocks.
2.	Initial cost	Initial cost of milking machine is high and not suitable for dairy farmers who rear one or two cows.
3.	Simplicity vs. Complexity	Proper disposal of dead cows (burial or burning) is a complex practice.
4.	Trialability	AI as a practice can be tried on one cow and see for its performance before adopting in all the cows.
5.	Observability	Benefits of vaccination or colostrums feeding to new born calves, de-worming etc are difficult to observe in the short period of time
	Compatibility	Culling of cattle especially cows through slaughter is not compatible with the social system.

There can not be any technology which is devoid of negative consequences. It is necessary for the extension agent to provide the information on both positive and negative consequences of the technology to the livestock farmers which enable them to take appropriate decisions (Table 3). However, this is possible if adequate information on the advantages and disadvantages of a particular technology in a particular social system are gathered through on farm trials. It is equally important for the extension agent to resist from the tendencies of painting a rosy picture of a technology to avoid future mistrust between him and the livestock farmer.

Table 3. Consequences of technologies or practice

Sl. No.	Technology or practice	Positive consequences	Negative consequences
1	vaccination	Protect the animal from disease	Reduction in milk yield Vaccine failure
2	AI with exotic bull semen	Female calf	Male calf
3	Crossbred cow	Gives more milk provided it is managed properly.	Susceptible to diseases; Poor performance under poor management
4	Urea treatment of straws	Slight increase in milk production and at a low cost	Feed gets exhausted fast thereby requiring more dry fodder.

The adoption of a technology usually follows a normal, bell shaped curve when plotted over time on a frequency basis. If the cumulative number of adopters is plotted, the result gives a "S" shape curve. Since all the individuals in a system do not adopt a technology at the same time, based on their time of adoption since the technology is introduced in the system, the adopters are categorized into, innovators, early adopters, early majority, late majority and laggards. Innovativeness is the degree to which an individual is relatively earlier in adopting new ideas than other members of a system.

The adoption process of a technology involves stages like awareness, interest, evaluation, trial and finally adoption. The rate of adoption is the relative speed with which a technology is adopted by the members in a social system. On adoption of a particular technology, in a given system the resulting outcome is measured in terms of technological consequences. The technological consequences can be classified into (i) desirable vs undesirable (ii) direct vs indirect (iii) expected vs unexpected. The studies on technological consequences are, therefore, conducted to evaluate the net technological impact in a given system due to its adoption in the system.

Technology Application: Assessment and Refinement, Demonstration and Training The technology application in the farmers‟ field is a pre-requisite for further steps in the process such as dissemination and adoption. The technology application refers to assessment and refinement, demonstration, and training of the farmers. The Technology Assessment and Refinement (TAR) refers to the process or a set of activities undertaken before taking up new scientific information for its dissemination in a new productive system. It is expected that the situation prevailing at farm condition differs from that of experimental condition under which the scientist develops technologies resulting in performance gap and dissatisfaction. Therefore, the technologies need to be reviewed, assessed and refined in terms of specific needs, opportunities and constraints faced by the farmers in different production systems. Some of the reasons for low acceptance of technologies are;

- not economically viable
- not operationally feasible
- not stable
- not matching with the farmers‟ needs and
- not compatible with the farmers‟ overall farming systems.

Therefore, the assessment and refinement of technology need to be:

- site specific
- holistic
- farmer participatory
- technical solutions to existing problems
- inter-disciplinary
- interactive and
- gender sensitive

The operationalisation issue involves a shift from discipline to programme mode, following the principles of systems approach, integration of bio physical and socio economic factors, and applied to local situations and farmers‟ resource in the form of On Farm Trials (OFT). On-Farm Trial aims at testing a new technology or an idea in farmers‟ fields, under farmers‟ conditions and management, by using farmer‟s own practices as control. The OFT is conducted in the farmers‟ field to know the suitability or applicability of the chosen technology in the farmers‟

conditions. It should help to develop innovations consistent with farmer's circumstances, compatible with the actual farming system and corresponding to farmers‟ goals and preferences. There are five steps involved in conducting OFT. They are (i) diagnosis (ii) planning (iii) conducting (iv) assessment and (v) extrapolation/extension. The diagnosis involves understanding of farming system and system interaction in the given situation, identifying the problems limiting productivity of the resources available to the farmers, understanding the problem causes, and listing out of possible solutions.

The planning phase involves setting out the priorities for conducting on farm trials. On listing out the priorities, the problem ranking is done based on the factors such as severity, importance, frequency and extent of prevalence. Further, the identification of the problem cause needs to be done to look for possible solutions and analyze the feasibility or applicability of the solution to solve the problem in the given situation. The identification is done through the methods like PRA and formal survey methods (direct observation), yield surveys, previous studies such as exploratory trials and long term monitoring of the situation.

Conducting on farm trials to see the technological applicability is a real challenge and need to be done by following the step wise procedures such as selection of the farmer, animals or farm, technology screening, actual implementation, recording of data, analysis, refinement based on the local situation in case of technology performance shortfalls due to situational demands.

Assessment of the technology/refinement by using its performance indicators is an important step in OFT as it involves selection of appropriate indicators, their measurement and making the farmers familiar with the procedures of measurement and recording the values.

The final step is the **dissemination of technologies** in the similar farming situations or micro climatic environment through conducting field demonstration, and empowering the farmers with suitable training for successful adoption of the technology in the given farming system.

The OFTs could be classified into three based on the stakeholder who is going to take the lead role. They are i) Research driven: Research system designed and managed (with the assistance of

extension) ii) Extension driven: Extension System designed and managed by farmers and iii) Farmer driven: Farmers designed and managed, with the assistance of Extension system.

Demonstrations

Demonstrations are very widely used extension teaching methods in demonstrating the skill or method or the result of a particular practice to the audience. Demonstrations if organized properly will arouse interest and improve the learning process. The demonstration is the most effective way to show how thing works, how to do the work, principles involved in an operation and to show the end results of the method adopted. On the basis of purpose for which the demonstration is conducted it is classified into (i) method demonstration and (ii) result demonstration.

Method Demonstration: A method demonstration is conducted to explain how to carry-out a particular operation according to its principles so that it is carried out systematically and yields better result. Through method demonstration the learners are taught "how to do something". The extension principle involved in the method demonstration is "learning by doing." The learners will be shown the right method for doing an old practice or taught about a new practice that are introduced to them. The method demonstration teaches new skills and helps the learner to obtain practical knowledge about something they need to practice or do in their day to day life. These demonstrations are intended to impart skills such as right method of milking, dehorning, feed formulations, de-beaking in chicks etc.

Result Demonstration: The value of a new practice can be realized better by seeing the end product or outcome in comparison with the existing practice. This is based on the principle of "seeing is believing". The result demonstration serves as an important tool to convince the farmers about the value of a new idea or innovation that is introduced to them as an option to their existing practice. Unless the farmers see the outcome or results of the recommended practice in comparison with their existing practice with their own eyes and experience, it becomes difficult for the extension worker to induce the farmer to adopt the recommended breed, strain or practice. In such circumstances the result demonstration helps the extension worker to make his job easy. The result demonstration could be ideally employed when it is intended to

demonstrate the effect of a new breed or feed formulation on milk production. However, the main constraint in conducting the result demonstrations is the observability of results. For instance the effect of drugs on health of the animals could easily be demonstrated and compared to the effect of vaccination on disease incidence. In addition, demonstration of certain practices like the superiority of a crossbred cow compared to a local cow in milk yield will take very long time and the farmers may not have patience to wait for such time.

Front-Line Demonstrations: It is a concept of field demonstration evolved by the Indian Council of Agricultural Research during the inception of Technology Mission on Oilseed Crops during mid-eighties. The field demonstrations conducted under the close supervision of scientists of the National Agriculture Research System is called front-line demonstrations because the technologies are demonstrated for the first time by the scientists themselves before being fed into the main extension system of the State Department of Agriculture.

The main objective of front-line demonstrations is to demonstrate newly released crop production technologies and its management practices in the farmers‟ fields under different agro-climatic regions and farming situations. While demonstrating the technologies in the farmers‟ field, the scientists are required to study the factors contributing towards higher crop production, field constraints of production and thereby generate production data and feedback information. Front-line demonstrations are conducted in a block of two or four hectares land in order to have better impact of the demonstrated technologies on the farmers and field level extension functionaries. The purpose is to convince extension functionaries and farmers together about the potentialities of the technologies for further wide scale diffusion.

Frontline demonstration is a long term educational activity conducted in a systematic manner in farmers‟ field to show the worth of a new practice/ technology. Only proven technologies are selected for field demonstrations. Field demonstrations educate farmers through results obtained in terms of varieties resistant to disease and pest, quality of the grains and overall higher yields. In addition, it also educates the farmers in term of input-output ratio and economic gains in terms of net returns.

These frontline demonstrations are being used to demonstrate crop technologies and to a negligible extent in case of livestock technologies. The front-line demonstrations are different from the normal demonstrations conducted by the extension functionaries. The special features of front-line demonstrations are:

- Front-Line Demonstrations are conducted under the close supervision of the scientists of the National Research Centers, Project Directorates and the State Agricultural Universities and their Regional Research Stations.
- Only latest proven technologies are selected for front-line demonstrations.
- Front-Line Demonstrations are organized in a block of two to four hectares involving all those farmers whose plots fall in the identified demonstration block.
- Only critical inputs and training are provided from the scheme budget, while the remaining inputs are supplied by the farmers themselves. Training of the farmers is a pre-requisite for conducting such demonstrations.
- The target audience of the front-line demonstration is both farmers and the extension officers and
- Front-Line Demonstrations are used as a source of generating data on factors contributing higher crop yields and constraints of production under various farming situations.

Training

Training is a process of acquisition of new skills, attitudes and knowledge in the context of preparing for entry into a vocation or improving one‟s productivity in an organization or enterprise. ILO (1986) defined training as activities which essentially aim at providing attitude, knowledge and skills required for employment in a particular occupation or a group of occupations for exercising a function in any field of economic activity.

Training provides a systematic improvement of knowledge and skills which in turn helps the trainees to function effectively and efficiently in their given task on completion of the training. Among extension services, training is rightly considered as a key input for human resource development and contributes substantially to face the challenges by all concerned (Working Group on Agricultural Extension for formulation of XI Five Year Plan).The training programmes

are idealistically designed and conducted for inducing changes in the durable aspects of persons, changes in relationships and changes in action. The training strategies vary depending upon the learning outcome the trainer seeks to achieve among their trainees. The training may be for improving the proficiency in the task performed or learning a process. The training modalities also need to be differentiated based on the requirement and type of organization which is imparting the training. Modality is a broader concept than the training method: for example several methods can be used for designing a particular modality. Training modality can be classified on the basis of (i) contact with learner (ii) formalization of training (iii) management of training and content emphasis.

Any training programme starts with identification of training needs, followed by translation of training needs into objectives. Based upon the objectives, the contents of the programme are developed, taking into consideration the knowledge, skill and attitude elements needed to achieve each objective. Once the training contents or topics are decided, appropriate training methods suitable for each topic should be selected. Then, the topics have to be put in a particular sequence and a complete course schedule with time and duration is to be decided. All learning and training is best done through active subject and therefore all extension professionals must understand well the basics of training in order to design and conduct successful training programmes. The effectiveness of training depends upon the extent to which the training objectives are realized which again depends upon the active participation and involvement of the trainers in training sessions.

Types of Training

Training has been conceived as a process consisting of three phases, viz. pre-training, training and post training. Pre-service training and in-service training are the types of training generally organized.

Pre-Training: Preparatory phase prior to the actual training process is very much essential. The trainer usually assesses the training needs of the intended trainees and designs appropriate course content as well as methods to realize the objectives set for the programme. Arrangements for

selection of participants, appraisal of course details and necessary preparations for conducting the training programmes are completed during the pre-training phase.

Actual Training: The training is organized as per the training plan/schedule. The activities such as reception of trainees, board and lodging, inauguration, guest lectures, organization of instructions, demonstration skill training, field trip, evaluation etc. are conducted during this phase. Due care is to be taken for creating proper training climate (favourable learning situation) for the participants to learn new ideas and skills. Good rapport and team building among the trainees need to be encouraged.

Post Training: The success of the training programme largely lies with the follow up activities undertaken after the conclusion of training. Post training tie up with related line departments for continuity, making arrangements with financial institutions for linking up trainees for getting financial assistance, providing them with information about further opportunities available in the field for their improvement, and impact analysis are must for making the training programme successful. The post training evaluation needs to be done and based on the feedback, necessary corrections for bringing about further improvement is a must.

Basic Training Approaches: The training approaches can be classified into traditional, participatory and performance based approaches. In the traditional approach the trainer designs the objectives, contents, teaching techniques etc. and the participants have no say in the process. In the participatory approach the trainer and trainees jointly decide the programme. In case of performance-based approach, the emphasis is given to acquiring of specific observable skill or attainment of a specific level of proficiency before clearing the trainee for successive levels.

Training Need Assessment

Training need refers to the gap between "what is" and "what should be" in terms of the trainees knowledge, skill, attitude and the behaviour in a given situation and time. It is important to analyze the training needs for designing an effective training programme as the programme must

address the training needs of the trainees. The following are four major approaches to assess the training needs:

(i) Performance

Appraisal In this method the actual performance of the trainee in a given situation is compared with that of the ideal or expected performance. It can be evaluated through direct observation, evaluation of performance records for a period of time and the individuals‟ self appraisal about their performance compared with their actual output. Through this method one can link between knowledge and skill requirements with their job performance.

(ii) Task Analysis

A detailed analysis of the task performed by an individual as per the standards and job chart is done. The data pertaining to the knowledge and skill requirement for the task, their performance in the actual situation need to be collected through interviews, case methods, and direct observation techniques. A detailed interview schedule need to be prepared for the assessment of training needs based on the task analysis for collection of relevant data. The schedule contains the details of different tasks and the frequency of performance of each task. The details such as level of importance and level of competency are obtained in a differential rating manner for each task. The common methods used for task analysis are interview, questionnaire, case method and observation. The task analysis is a process by which one can know the different elements or sub-tasks which are critical for its performance.

(iii) Survey Method

It is one of the most frequently used methods. The need analysis is done based upon the individual perceptions and opinions of the individuals for whom the training programme is intended. Data will be collected through structured schedule, questionnaires and interviews. This method is comparatively fast and less expensive. Through this method a large number of people can be involved in the training needs identification.

(iv) Competency Study

Under this method, a thorough job analysis is undertaken to know the different qualities needed for the individual to perform his job effectively and efficiently. Based on the qualities required, the individuals are further assessed in terms of their competencies in performing the job. The competencies in terms of knowledge, skills and other qualities required are identified by involving the experts. A thorough analysis is made by matching the individual qualities with the expected competencies required for the job. It involves active involvement of experts and the trainees through a whole hearted open discussion approach to arrive at the right conclusion. This method is relatively fast and less expensive.

(v) Skill-Gap Analysis

It is a process of determining the training needs of individual trainees in relation to important tasks-steps or components of tasks identified for training. It determines how skilled or proficient individual trainees are on these tasks or components, how many of them differ from the desired performance and whether or not they need training in a precise manner.

Review Questions

1. What is the objective of animal health extension?
2. Explain the philosophy behind extension education?
3. Why Audio-Visuals is used for extension communication?
4. What are the challenges associated with livestock technology transfer?
5. Discuss on the elements of extension education process?

CHAPTER TWO

The objectives of this chapter are:

- To give overview about Ethiopian livestock sector
- To describe and characterize the livestock production system
- To discuss on the current challenges and opportunities of the sector

2. Description of the Ethiopian Livestock Sector

Ethiopia is believed to have the largest livestock population in Africa. Livestock is a major component in agriculture in Ethiopia and elsewhere in Sub Saharan Africa countries contributing more than 50 percent and 20 percent in agricultural and total Gross Domestic Product (GDP), respectively. The sector is quite promising to rally round the economic development of the country. The livestock sector plays an important role in the rural economy of Ethiopia. The importance of livestock in Ethiopian agricultural economy has been well recognized. Next to crop, livestock is the single largest asset in rural Ethiopia. Given Ethiopian's agro climatic diversity, a large variety of livestock are available for draught power, milk, meat, eggs, etc and thus ensuring additional income to the livestock farmers. About 80 percent of the Ethiopian rural households are keeping the livestock out of which the resource poor farmers own nearly 90 percent of the livestock. Therefore, livestock and livelihood have an intimate relationship particularly in arid and semi-arid areas. Further, livestock production in Ethiopia is largely an output of small holders and majority of rural households depend either directly or indirectly on livestock for their livelihoods.

It is eminent that livestock products and by-products in the form of meat, milk, honey, eggs, cheese, and butter supply etc., provide the needed animal protein that contributes to the improvement of the nutritional status of the people. Livestock also plays an important role in providing export commodities, such as live animals, hides, and skins to earn foreign exchanges to the country. On the other hand, draught animals provide power for the cultivation of the smallholdings and for crop threshing virtually all over the country and are also essential modes of transport to take holders and their families long-distances, to convey their agricultural

products to the market places and bring back their domestic commodities. They provide additional sources of income, food, clothing, labor and cultural prestige. Livestock as well confer a certain degree of security in times of crop failure, as they are a "near-cash" capital stock. Furthermore, livestock provides farmyard manure that is commonly applied to improve soil fertility and also used as a source of energy such as dung cake as a fuel for fires and as bio-gas energy. Even more importantly, livestock provides a major source of supplementary income for a large majority of rural households and this sector is therefore, highly livelihood intensive and more importantly provides sustenance during drought and other natural calamities to rural families.

Due to the very important role that the livestock sector plays in the economy of the country, formulation of development plan regarding the sector is indispensable. Improvement in livestock production is, therefore, an important pathway for increasing the income of marginal and small farmers and landless laborers, given the uncertainties of crop production. These livestock data can be generated usually using surveys and censuses.

Table 4. Ethiopia statistics for livestock population for the period 2009/10

Regions	**Cattle**	**Sheep**	**Goat**	**Horse**	**Mule**	**Donkey**	**Camel**	**Poultry**	**BeeHive**
Tigray	3,243	1,150	3,107.99	5.427	7694	456	32	4,266	196
Afar	550	604	801.5		*	37	218	29	*
Amhara	12,747	8,597	6,022.11	353.00	128	2,108	35	12,740	822
Oromia	22,475	9,453	7,439.73	1,299	175	2,495	257	15,337	2,486
Somale	591	1,067	1,374.54			118	255	56	0
Ben Gumuz	422	89	321.6	*	0.758	53	_	821	233
SNNP	10,543	4,935	2,626.61	336	57	425	_	8,504	775
Gambella	221	26	31.82	0.375	*	*	_	210	83
Harar	45	5	36.32	_	_	8.74	*	39	0.731
Addis A.	0	0	0	_	_	_	NA	NA	NA
Dire Dawa	47	55	36.32	_	_	13.13	8	51	0.534
Total	**50,884.00**	**25,981.00**	**21,798.54**	**1,993.80**	**8,054.76**	**5,713.87**	**805.00**	**42,053.00**	**4,596.27**

Source: FAOSTAT, 2009/10 * No record

Livestock Genetic Resources: With its varied climatic and topographic conditions, its ethnic composition and the size of its national herd, Ethiopia is a major repository of livestock resources and genetic diversity but little has yet been done to describe them other than in superficial terms. “Breeds" are recognized by morphology, or more often by the name of an ethnic group or locality. Much still needs to be done at the genetic level to gain a fuller understanding of the relationships among types, classes, breeds and populations.

Cattle: Most local cattle are zebus; recognized breeds, including Boran, Fogera, Horro, Sheko (Gimira), Abigat (Adal), are indigenous to and synonymous with particular regions. The Fogera and Horro are known as milk producers, the first being reared round Lake Tana in Amhara State and the second in Eastern Welega in the west of Oromiya State. The Boran, renowned as a beef breed well beyond the boundaries of Ethiopia, is also "indigenous" to Kenya and Somalia where its tribal owners claim territory; it is found in the south and east of the country in the Southern Nation Nationalities and Peoples' Regional State (SNNPRS) and in Somali Regional State. The Nuer breed in the southwest is considered to have tolerance to high tsetse challenge. European breeds, especially Friesian and Jersey, have been imported for many years and crossed with indigenous cattle to improve dairy production.

Sheep: Almost all sheep in Ethiopia are indigenous; several breeds have been identified but are less clearly differentiated than cattle. These have evolved in-situ under various, but universally harsh, conditions of health care, feeding and management and often of climate. Their output is low but is probably capable of being improved if better circumstances are provided. National Research Institutions and the International Livestock Research Institute (ILRI) have done some preliminary breed characterization. Formal cross breeding has been confined to the Debre Berhan station of the Ministry of Agriculture (MoA) at about 2,800 metres some 120 kilometres north of Addis Ababa. The main "improver" breeds have been Awassi and Corriedale but little success has been achieved in transferring results to the smallholder sector.

Goats: Until very recently, the situation was very similar to that for sheep; their huge genetic resource was largely unknown in terms of breeds or population composition and there was confusion over terminology. Some early types identified included a short haired goat in the

Danakil Desert, the white and variegated goats of the Hararghe highlands, a Bati goat in Wello valued for its skin, the Arusi goat and other types of the western lowlands. More recently a comprehensive survey of goat populations included physical inspection and handling of more than 14,000 animals. In this study a number of qualitative and quantitative variables were used to characterize goats into four major categories and 14 distinct types; estimates of geographical distribution and population size were also attempted. Further information was gained on production systems, management practices, flock structure and reproductive history.

Camel: In Ethiopia, camels are found at pastoral area. The breeds are one humped breed belongs to camel dromedary.

Poultry: local poultry are classified in to ecotypes which include Horro, Jarso, Sheko Tilili and the like. There are also some exotic breeds introduced to Ethiopia. This includes Fayomi, Isa brown, Lehmann silver, Rhode Island Red, Cockock, Hubbard breeds.

Equines: Ethiopia has numerous Horse, Donkey and Mules. They are partially classified on the bases of morphometric and ecology with limited genetic diversity. Their distribution varies in which donkey are found mainly in lowland, while the horse are more common in mid-land to highland.

Activity 2.1

1. What is livestock?
2. Describe Ethiopian livestock sectors?
3. Mention the main contributions of livestock in Ethiopian economy?

2.1 Classification of Livestock Production System

The five traditionally classified agro-ecological zones (Bereha, kola, weinadega, dega and wurch) which are based on altitude and temperature gives foundations for clarification of Ethiopian livestock sector. Ethiopian farmers have long recognized that altitude, climate, water availability, vegetation and other physical and biotic factors are interrelated to agricultural

potential and production. The traditional classification, developed over thousands of years, divides the country into major and minor agro-ecological groups based primarily on altitude and rainfall. Each zone and sub zone is further characterized by variations in economic activity, population density and other socio- cultural attributes such as cropping and livestock rearing patterns.

The dominant livestock sectors in all agro-ecological zones are small-scale subsistence farms in the highlands and livestock rearing in the lowlands. Large enterprises like state farms were government holdings which are being privatized. Current private investments are mainly in the agro-industrial sector especially on dairy and beef production. Livestock production systems in Ethiopia are as complex as the agro-ecological zones, and amplified further by the cultural diversity of people. General descriptions of the major livestock production system are discussed below.

Based on the scale of production

- Small scale
- medium scale
- Large scale

There are different levels of production management system in Ethiopian livestock.

- Extensive production system
- Semi-intensive production system
- Intensive production system

Farming system in Ethiopia is by large dominated by smallholder extensive system where mixed and pastoral production is within the system.

Characteristics of Extensive Production

- Local breeds
- Low performance
- Kept in a traditional husbandry

- Few input and output
- Limited animal health and production improvement

Ethiopian livestock production systems can be classified into three broad categories:

- Subsistence crop related livestock production
- Purely pastoralist production and
- The private commercial or parastatal production.

In the first two systems enterprises are mainly small holdings, while the last includes medium to large-scale market oriented production units. Parastatal and commercial livestock production systems with more intensive animal production, are mostly found around peri-urban and urban areas and to a lesser extent, around the previous farmer' co-operatives and few private rural areas. Dairying and fattening of oxen and small ruminant are the most popular activities.

Small-Scale Subsistence Production: In this system where food and cash crop growing is the main agricultural activity, farm size ranges from 0.5-1 hectares. Soil fertility maintenance is a major problem. Livestock are for draught, seasonal milk and meat production and a source of food and income. Cattle are the main stock. Feed resources are natural pasture, crop residues and to lesser extent improved pasture and forages. Milk yield is 1 litre/day, and average land area 0.25 hectares per animal.

Medium Scale Intensive Dairying and Fattening: Farmers use all or part of their land to grow improved pasture and forage, some buy agro-industrial by-products and use their land for food and cash crops. Manure is used on crops. Milk is the main source of income and farmers use family labour and sometimes hire help for dairying and fattening. Feeds are from improved pasture and forages and purchased concentrates. Milk production is continuous from crossbreed animals (Local Zebu crossed with Friesian), ranging from 5-8 litres/day; a crossbred animal occupies 0.5 to 1 hectare, on holdings of 1-2 hectares. Major inputs include crossbred cows, artificial insemination, credit, veterinary extension and training.

Peri-urban Commercial Dairying: This occurs around cities where demand for milk is high. The main feeds are agro industrial by-products (concentrates) purchased bush hay, improved pasture and forages and crop residues. Milk, often sold directly to consumers, is the main source of income. High-grade crossbred cows, are fed on purchased concentrates and roughages; the enterprise is commercial. Milk production is continuous and yield per crossbred cow ranges form 10-15 litres; a cow is held on between 0.25-0.5 hectares. Inputs include concentrates, roughages, grade stock, Artificial Insemination, credit, extension, training and veterinary services.

Feeding Systems: Livestock mainly feed on natural pasture, weeds of arable land, fallows and crop residues left after harvest. Bottomlands are set aside for hay to be used for severe dry periods. In the highlands farmers' fence small areas of pasture, which are grazed by oxen at the time of ploughing and used to feed young calves. Most stock graze on hilltops, swamps, forest margins, roadsides and stony or unfertile lands.

Fallows and crop residues are grazed in the morning and evenings as cattle are taken to and from daytime grazing areas. Small calves, which cannot go to distant areas, graze fallows and crop residues. Cut and carry feeding and dry season feed supplemented with crop residues and agro-industrial products are common in the mid and high altitude mixed farming systems.

In high potential areas dairy farmers grow improved pasture and forages, mainly fed on cut and carry, and hay. Dairy associations have started silage making for their milch cows. Farmers involved in small-scale fattening do cut and carry and hay (from natural pasture and crop residues) feeding. Residues of local grain by-product and beverages are mixed with salt and given to milking cows, plough oxen and fattening animals. In the lowlands (pastoral areas) livestock graze and browse.

Integrated Crop-Livestock Production System: In the mixed production systems, cattle play an important role by supplying draught, while equines are the highland beasts of burden. Small ruminants and poultry are the main source of cash and family consumption. In the higher areas (above 3,000 metres) barley and sheep predominate; this system covers parts of North-Wollo; the Eastern Mountains of Gojjam and the Semen Mountains of Gonder.

Highland Annual Crop and Livestock Farming: The high crop-related livestock production system is found between 1,500 and 3,000 meters with an estimated area of 12,500,000 hectares. A wide range of cereals, oil crops and food legumes are grown. Cattle are kept for traction and fuel, a small number of sheep and goats provide cash. The system is common in the highlands of Tigray, Wollo, Gonder, Gojjam, Shewa and parts of Wellega. Farms are very small and often fragmented. Due to high population density and expanded cultivation, grazing areas are reduced to lands unsuitable for cropping, or fallows, waterlogged land and steep slopes. The feed situation in this system is precarious and a challenge to the development of both the resource itself and food grain production.

Highland Perennial Crop Farming: Another mixed system found between 1,500 and 3,000 metres. This area has intensive crops with cultivation and livestock number per household being higher; it is predominant in Southern Ethiopia, particularly the Chat (Catha edulis) and coffee growing areas of Harerge; and enset (Ensete ventricosum) plantations of Walaita, Sidamo and Gurage. It also touches the coffee growing area of Jima and Wellega. Livestock are not important for traction as hoe cultivation is used in the highland perennial crops. Feed in this system is from native pasture and crop residues.

Small to Large-scale Livestock Production: In many agro-ecological zones at low altitudes 1,500-500 metres (kola-zone) growing seasons are short to very short, so only drought resistant crops can be grown, unless irrigation is possible. Livestock are important throughout this zone. The poor conditions for crops and the extensive system of livestock production imply low human population. There is large-scale ranching, particularly fattening for domestic and export markets; ELFORA Pvt. Ltd. Company (ex. Livestock/Meat Development Corporation) is one large-scale (commercial) livestock/Meat producing company operating here.

The lowlands are the home of a diverse array of pastoral people who depend on livestock, which feed on native vegetation, and net productivity is very variable over time and space. The lowlands are home to 29 ethnic groups, of which more than 90 percent are **pastoralists**. Livestock provide subsistence and employment for more than 10,000,000 people and are a

source of meat, milk and fibre for residents of some two dozen major towns and cities within or adjacent to the lowlands. Subsistence nomadic and semi-nomadic pastoralists are the major stockholders on the grazing land. Afar, Somali and Borana are the major pastoral groups in the north eastern, eastern and southern grazing lands. Detail about the pastoral production systems and stock management are described in pastoralism section of the module.

Activity 2.2

1. List the major class of livestock production system in Ethiopia?
2. Write the characteristics of extensive production system in Ethiopia?

Review Questions

1. Which livestock production system is common in Ethiopia?
2. Discuss on the characteristics of extensive production system?
3. Explain how does the agro-ecology and culture contribute for the diversity of livestock sector in Ethiopia?
4. Why do you think the livestock and agriculture are very interdependent in Ethiopia?
5. Explain what by mean Livestock can be used as a “near-cash” capital stock?.

CHAPTER THREE

The objectives of this chapter are:

- To describe the animal health extension teaching,
- To discuss on the teaching approaches best practicable in Ethiopia.

3. Animal Health Extension Teaching Methods and Alternative Approaches

Knowledge transfer from the professionals to the society is a key intervention for the prevention, control and eradication of important endemic disease. Previously there is no strategically well deigned approach to teach the society about the animal health and zoonosis. As there are professionals on agricultural extension (focusing more on plants) and public health extension workers who are focusing on improvement of public health. But, such extension service is not well practiced on animal health. The eminent gap of perception of the society about animal disease was actually arisen due to the absence of well-designed attempt of animal health extension service. Even though the fact that animal health care means care of the society which comes in bold particularly in the case of zoonotic disease, it is partially neglected between the medical and veterinary professionals.

Currently, there is increasing trend of veterinary professional diversity, number and also veterinary infrastructures, universities and other service posts which can be considered as baseline for animal health extension. But still the service given mainly targets the convectional attempt of disease treatment and pilot vaccination delivery to the animals with limited attempt for transfer of the knowledge about the disease and associated risk factors to the community at large. Chemotherapy becoming the dominant and routine attempt to prevent and treat sicknesses, which usually come up with problems of antibiotic resistance and other side effects.

As it is known that “prevention is better than cure” the service to be delivered need to targeted more on the prevention of the disease. For sustainable development of the sector: efficient, multidisciplinary and community based health service is central. Clearly, it needs to include an attempt of improving the understanding of the community about the disease as it is quite

important to alert the mind of animal owners rather than only treating the physical body of the animal.

On other side disease determinant concept is very important as the cause of the disease may vary and will directly or indirectly determines the fate of an animal. Such determinant issue particularly environmental risk factors and animal management practice is usual manipulated by the farmers. Farmers are always key person behind the health of an animal as he can decide where to keep, how to keep, what to fed and when to bring the animals to the clinic. So, emphases need to be redirected to such prevailing determinants and it can easily be addressed using the animal owner themselves. Thus, the veterinary service should encompass the strategies of combating such area.

Livestock owners have been living with their animals for generations and have built enormous indigenous experiences with animal health. It is recognized that illiterates can learn when visualization is used. People learn a lot by doing practice, from pictures, posters and other demonstrations. They easily understand by learning simple courses first and may gradually advance to more additional courses as needed. This enables them to build modern knowledge on existing fertile grounds by strategically linking the system of animal health extension to the conventional public and private veterinary services.

On behalf of these, veterinary teaching and health extension service play the focal point. Hence it is very important to re-design and include an active veterinary health extension program to the conventional animal health care services. With this aspect the present module has written to address some policy and alternative approaches so that it can be used to teach pastoralists, farmers and other stack holders of livestock sector.

Table 5. The domain of knowledge covered by Animal Health Extension

No	Topic	Teaching Methodology	Remark
1	Animal Vaccination and Disease Prevention • importance of vaccine • when/what/who/where to vaccinate?	• Oral presentation • Written Pamphlets • white board,	General
2	Animal treatment importance • Importance of early treatment • Disease case history and reporting • Importance of proper treatment	• written Pamphlets, • white board, • Discussion	General
3	Animal management/food and feeding • Management associated diseases • Feeding problems/deficiency disease • Management risk factors	• Oral presentation • Show how to clean barn/lairage • Preparation of balanced food	General
4	Zoonotic disease Concept/Risks • What are zoonotic diseases? • Rabies, BTB, Anthrax, Taeniasis, Salmonellosis, Brucellosis, • How to prevent/treat it?	• Discussion on the issue • Oral presentation • Awareness creation on the transmission pathways of such disease.	Major
5	Reproduction and Animal Physiology • Importance of AI, Eustress detection systems, improvement of milk prod., • Beef animal management/ castration	• written Pamphlets, • white board,	Specific
6	Other important infectious disease • Foot and Mouth Disease • Trypanosomiasis • Ticks and tick born disease	• Oral presentation. • Signify the issue and forward protective measures	Specific
7	Feedback Assessment	Questionnaire survey	

3.1. Animal Health Extension Teaching Approaches

1. **Formal training:** It is the type of training that can be given to the selected model farmers or pastoralist for specific time (2 to 3 months) about the primary health care and animal husbandry. The training approach is considered to be related to the extension approach. It emphasizes more systematic and deeper learning of specific basic skills and related knowledge. Training programmes involve assembling learners in a training centre for a specific period of instruction. These trained extension workers transmits the useful knowledge gained by them to the rural people. The Training and Visit system is a good example of the training approach in Ethiopia. The training can be modified based on agro ecology or social structure characteristics of the specific society or based on other factors. There are some characteristics of the formal extension training:
    - The farmers can be certified at the end of the training. Example of such training may include CAHWS training, training the selected farmers at farmer's training center and training the selected farmers at other alternative places.
    - Training manual is needed
    - Stakeholders and beneficiaries like veterinarian, farmers, paravet, local leaders, NGO, and related professionals are needed to be identified.
    - Various constraints like lack of regular training programmes for updating the knowledge of extension workers, lack of communication from research, excessively large areas of operation for village level workers and extension officers resulted in a new approach in extension.
2. **Teaching Animal Attendants**: It is continuous teaching system in which every animal attendants come with their sick animals will get information about animal health. It is not formal training but the animal health care service provider will have a regular program to create awareness for the society about animal health care. There are some arrangements need to be made to teach animal attendants.
    - First the animal attendant of a given day will be informed to keep tied their animals in the lairage of the clinic.

- Then all of the animal attendants will be gathered and teach them for about 30 minute and after that, someone who want to discuss more on the subject matter can ask question for clarification.
- The teaching day may be flexible: usually Monday or other days when there are many animal attendants appeared.
- The teaching material can be formally prepared manual or leaflets/Pamphlets, Brochures, posters and other visual aids. It is better if prepared by local language and in simple statements.
- The teaching material should be readily available.

3. **Case Level Teaching**: This approach is just individual animal owner will be informed about the case of his/her sick animal. This is thus specific to the disease (case came to the clinic and specific animal owner). There are some steps to be considered to deliver the information via case level teaching:
    - First, the animal need to be diagnosed according to the usual cases (just by taking the case history, clinical examination and if needed doing laboratory examination).
    - After you examined the animal, you will tentatively guess the possible cause of the disease.
    - On that specific diagnosed disease, the animal owner will be told about the disease, transmission, and associated risk factors. It may be simple recommendations on that specific disease. Explain to the animal attendant about the protective and control measures for future. Example. Trypanosomosis: If you see animal sick of similar disease/similar sign; you need to bring on-time, isolate the animal from tsetse infestation area, spray insect repellant on the animal body etc...
4. **Other Alternative Teaching:** Teaching of the farmer at community meetings or at other Social gatherings. The topic and time should be very limited. (Only lay on critical information). For example:
    - Holy days,
    - Religious or culture festival.
    - Farmers' or Pastoralist days

- Establishing animal health and welfare club at the schools. This helps to teach them by discussing with teachers etc..,

3.1.1 Materials used for teaching farmers

For communicating an idea, experience or technology, extension worker use **audio-visual aids** because audio-visuals help to communicate the message effectively and efficiently. They provide the audience with a situation nearest to the reality and readily get the idea. Visuals help to give correct initial concepts by giving true mental impressions. While planning for the use of audio-visual aids the extension agent need to be selective in using the aids taking into consideration different factors like the audience (age, sex, level of literacy, previous experience etc.), availability and cost of equipment, familiarity of extension agent with the equipment, facilities required for use of the aids, subject matter etc. Above all it also depends upon the objective or purpose of the communication.

In extension teaching **literature** plays an important role in the message dissemination process. The literature serves the purpose of communicating precise and reliable scientific information in a simple and easily understandable language to a common man. Some of the common literatures that forms the part of extension teaching learning process are briefly explained as follows.

- **Leaflet**: A leaflet is a single sheet of printed matter. It is made to give accurate or specific information on a specific topic.
- **Folder**: A single sheet of printed information in a folded form. There can be any number of folds in a folder. Like leaflet, folder is also primarily meant for dealing with a specific topic.
- **Pamphlet**: A pamphlet consists of 3 to 12 pages and deals with a specific topic in a detailed manner.
- **Bulletin**: The number of pages for a bulletin ranges from 12 to 20. A bulletin is a written piece of information about a number of related topics presented in a detailed manner.
- **Booklet**: When the number of pages exceeds 20 then it is called a booklet. Usually a booklet deals with number of topics and the discussions are carried out more elaborately with illustrations, pictures, figures and tables.

- **Circulars**: Letters are sent to a group of people by passing it out from one man to other to pass on certain information or messages. Circular letters help to maintain a continuous contact with farmers.
- **Newspaper/ Newsletter/ Magazine/ Journal**: Periodicals give a wide range of information about what is going on in the next door and around. It is mass media which can be of immense use in message dissemination. It helps to serve as a forum for extension activity in an area. It plays the role of communicating the information to people of various levels and acquaint the public with programmes, activities and progress made in an area.

Other Communication and Advanced Technologies

- Oral presentation, Geographic Information System (GIS)
- Tele and Audio Conferencing
- Video show
- Demonstrations, White board, Pictorial presentation and posters
- Cyber Extension and Information Communication Technologies (ICTs).

Activity 3.1

1. What is animal health extension teaching?
2. How does health extension help on disease prevention and control?
3. List the audio-visual aids and materials that can be used for animal health extension teaching?

3.2. Challenges for Animal Health Extension in Ethiopian Situation

In Ethiopian situation, many millions of people whether directly or indirectly depend on livestock. Livestock owners spread throughout the country. Resource poor livestock farmers contribute a lot to production of milk, meat, egg, hide and skin etc. Common property lands are shrinking leading to increased dependency on purchased inputs. Majority of livestock keepers are poor and are women highly involved. Veterinarian, who are the most credible source of information on livestock rearing are found inadequate. The market for livestock and livestock

products is mostly unorganized. Per capita consumption of milk among the resource poor milk producers is very low as they rear low productive animals. Above all there are many endemic and epidemic diseases along with low perception of the people about strategic disease prevention and control.

This dynamic livestock situation is posing several challenges to animal health extension services. Some of the challenges with which the extension personnel have to cope up with are;

1. How to reach millions of livestock owners spread in every nook and corner of the country especially those who are thriving in Complex, Diverse and Risk prone environment?
2. How to improve the living standards of the rural livestock owners through livestock extension of animal husbandry and health extension service especially when the pressure on land is increasing and common property lands are slowly fading out forcing the rural poor to maintain the animals on purchased fodders?
3. How to sustain the production and quality of livestock products with decreasing area under fodder and increase in the competition for feed resources and decreasing interests of the people in livestock rearing?
4. How to face the emerging livestock disease situation as a sequel to the technological and development interventions?
5. How to take cognizance of the changes that are taking place in the society which include : Shift from farming to industry; Shift from rural to urban (migration); Shift from grazing to stall feeding; Shift in focus from social to economic issues.
6. How to deliver the improved technology packages and animal disease prevention and control strategies in a suitable and understandable ways?

Target Groups and Stakeholders: Livestock development involves a number of target groups with whom the extension agents need to work with. These groups include;

- **Livestock owners**: All those who own livestock (dairy farmers, sheep and goat keepers, poultry farmers, etc.)
- **Livestock service providers**: Animal Husbandry department personnel, Marketing institutions like Milk Cooperatives, Microenterprises, Training institutions like Veterinary agency, Federal and Regional Diagnostic Laboratories, NGOs, Research and

Academic institutions like National Veterinary Institutes (NVI), Veterinary Universities/ Colleges, National dairy and Meat Institutes, Bankers, Insurance agencies etc.

- **Input suppliers**: Semen banks, feed mixing plants, Pharmaceuticals, vaccine production units, Livestock product processing units, Fodder seed production units, Agro related industries etc.
- **Policy makers**: Ministry of Agriculture and Animal Husbandry, Secretaries of AH organizations, senior officials of Animal Health Department, Veterinary Associations, Milk Federations, Researchers, Farmer organizations etc.

3.3 Social and Cultural Factors in Extension Education

An extension agent will be more effective if he **understands the social and cultural background** of the farmers with whom he/she works. He/she will then be better able to offer advice that fits in with the culture of the society; it is useful, therefore, to examine the main features of societies and cultures that are relevant to extension work.

- Farmers and their families are members of the society in which they live.
- In any society, there are strong pressures on its members to behave in certain ways.
- In all societies, there are accepted ways of doing things and these ways are directly related to the culture of the society.
- Farmers' attitudes and desires are influenced by their society's culture.
- If it is customary in a certain community for farmers to scatter seed and plough it into the soil, people will grow up to believe that that is the only correct way of planting.
- Even if the benefits of other methods are explained to them, their strongly held attitudes may make it difficult for them to change.
- In some communities, an unmarried man is expected to work on his father's farm; only when he marries will people expect him to start farming his own plot.
- A successful farmer may be expected to give food, money and shelter to relatives who have not been so successful, or to pay for his relatives' children to go to school. If a person resists these expectations, those around him will show their disapproval.
- Because most people like to feel acceptance and approval from those around them, they tend to behave in accordance with such expectations.

A. Social structure

The structure of a society is the way it is organized into families, tribes, communities and other groupings or divisions. A person's attitudes, and people's expectations of that person, are influenced by the groups to which he or she belongs;

B. Social divisions

Divisions within a society can be based on several different factors, including age, sex, religion, residence, kinship and common economic interest.

Age: People of the same age usually have similar interests and attitudes. An extension agent needs to learn the particular aims, expectations and restrictions of different age groups in the society in which he works

Sex:

- Traditionally, in rural areas, specific tasks are done either by men or women.
- Usually women are responsible for household jobs, such as cooking, collecting water and firewood or looking after children.
- However, in many countries, women also do a lot of farm work. In a number of African countries, over 60 percent of all agricultural work is usually done by women.
- Agricultural extension often concentrates on men, with male extension agents visiting male farmers.
- But any change in the way people farm will also affect the women, and thus may well fail unless extension agents involve women in their programmes.

Religion:

- Members of religious groups have common beliefs and attitudes, and these may influence their willingness to work closely with people of other religions.
- Religious differences can create tensions in a rural community: the extension agent should be aware of these.

Residence

- People who live close to one another usually have some interests in common.
- These common interests can unite the village, particularly if such interests are threatened.

- Where possible, extension agents should try to include in their programmes activities which will unite the whole community in a common task.

Kinship:

- The strongest groupings are often those based on relationships of birth and marriage within and between families. The smallest of these groupings is the family, which consists of a man, woman and children.
- In other societies, larger kinship groups may live together, own land in common or even take joint decisions about farming. When this happens the individual farmer may have little freedom of decision. An extension agent would need to find out who are the leaders and decision-makers of such groups, and work closely with them.

Common economic interest*:*

- Economic differences are an important part of social structure.
- The type of job people do, the amount of money they earn and the quality of land they own or can rent are factors which can divide society into distinct groupings, each with its own concerns, interests, values and attitudes.
- The most important economic factors creating divisions within rural societies are the amounts of land and money that each farmer has.

C. Formal and informal leaders

People who hold recognized positions of authority are known as formal leaders. Some inherit their position; others are elected, and others are appointed by someone in higher authority. In any rural community there will be a number of formal leaders: for example, religious leaders; the chairman of a cooperative; a traditional headman; heads of kinship groups and families; a village; local leaders of political parties. The exact pattern will vary from one society to another, but the extension agent should learn what the role of each leader is, and how much influence each has within the community. This may vary from place to place, even within an extension agent's area. A traditional chief in one village may be more influential than an elected , while in a neighbouring village the opposite may be the case.

In many rural societies, the extension agent will have little success unless he first gains the support of the traditional leaders. Only then will he be able to win the trust and confidence of the

members of the community. Informal leaders are not so easy to identify, because they do not hold any particular position of authority. They are individuals who are respected by other people. Extension agents can find out who these influential people are by observing who speaks out at village meetings or by asking farmers who they normally go to for advice.

An extension agent can be more effective if he works through the existing structure of a rural society and through its formal and informal leaders. However, such an approach also has its **limitations**. Influential leaders often come from the more privileged sections of the community. They may simply keep the **benefits of extension, and of agricultural credit and inputs**, to **themselves and their friends**. By working through such leaders, extension may widen the **gap in living standards** between the different sections of society. The agent, therefore, should seek to work through existing formal and informal leaders, but should ensure that this approach does not leave some farmers at a disadvantage.

D. Social Expectations

It was stated earlier that a person's position will determine the way others expect him or her to behave. These expectations are known as norms. It is the norm in some societies, for example, for a married woman to eat her meal only after her husband has finished eating. These norms are deeply ingrained in people's attitudes and beliefs. They not only determine how other people think an individual should behave; they determine what behavior the individual feels is correct. Extension agents should be sensitive to these expectations and should not underestimate their influence on people's behaviour, however irrational they may seem at first.

E. Culture

The culture of a society is the accepted way of doing things in that particular society. It is the way in which people live, their customs, traditions, methods of cultivation and so on. The culture of a society is learned by each individual member of that society. Children are not born with this knowledge; they learn by seeing how older children and adults behave. Culture is not an accidental collection of customs and habits but has been evolved by the people to help them in

their conduct of life. This is important to remember when planning extension programmes. Changes in one aspect of culture may have an effect on other aspects of that culture. This is one reason why local leaders and farm people should help in planning an extension programme. They will know whether or not the changes proposed will be acceptable to the society.

The more an extension agent learns about and comes to respect the culture of the people with whom he works, the more he will be accepted by them. He will also be more sensitive to the type of advice and support that will be useful. There are five particular aspects of local culture that the extension agent should be aware of: These are described as follows:

- **Farming systems**: Before he can offer any advice to farmers, the extension agent must understand their present farming system. Farming systems are complex, and change in one aspect may create problems in others. In parts of **Nepal**, for example, millet is sometimes planted between maize plants. Thus, any change in maize spacing or subsequent weeding practice will affect millet production. Similarly, in regions of **Nigeria**, up to 12 crops may be grown together on a single plot. Once he is familiar with local farming systems, the extension agent can explore the possibilities for improvement. New farming practices will be more acceptable to farmers if they can be introduced into existing systems without drastic changes.
- **Land tenure**: Land tenure consists of the ways in which people obtain the right to possess and use land. Land-tenure systems vary from one society to another. In some communities land is owned by a tribe or kinship group, in other societies individuals can buy land and do what they like with it. The land-tenure system will affect people's ability and incentive to take extension advice. In some countries, for example, land is farmed on a share-cropping basis. The farmer gives a fixed proportion of everything that is produced on the land to the landowner. The farmer will, therefore, be unwilling to adopt new practices if most of the benefits will go to the landowner.

F. Inheritance

The way in which land and other possessions pass from one generation to the next also affects extension work. In some cultures, a man's possessions are inherited not by his children but by his

mother's brothers and their children. In many areas, it is normal practice for a man to divide his land between his sons and daughters before he dies. Such a farmer will not want to do anything to the land that will make it difficult for each portion to be farmed separately later. In other rural societies, land is not inherited at all. Extension agents should understand the local inheritance rules, because they will affect the ability of young farmers to acquire land, and to take their advice.

G. Ceremonies and Festivals

Ceremonies are a central feature of culture. Include religious festivals, celebrations to mark important seasons, ceremonies for events within the life of a family or community, such as marriage, birth and death. An extension agent needs to know when these take place so that he can plan his activities around them. He should also take care to behave in the appropriate way on such occasions.

H. Traditional Means of Communication

All societies have ways of spreading information and sharing ideas. Songs, proverbs, drama, dancing, religious gatherings and village meetings are just a few of the traditional means of communication that an extension agent may find in a rural area. There are two main reasons why these means of communication are important for extension:

- ✓ The extension agent can **learn from them what people in the community are saying** and thinking
- ✓ The extension agent can **make use of these traditional means of communication** to pass on information and ideas. Many extension services now use drama, puppets and songs to convey new ideas.

I. Social and Cultural Change

Social structures and cultures are never completely static; they can and do change. Although the extension agent should respect and work through the existing culture and social structure, his

task should be **to help to speed up cultural change** in farming. This may in turn contribute to wider social changes. As ideas or methods are accepted within a society, they gradually come to be regarded as customary. New farming systems and crops can also be introduced. Cocoa was unknown in Ghana until it was brought from the United States. Being aware of the social and cultural changes occurring in the area where he is working, the agent should try to understand the factors that can bring about such change.

J. Factors in Change

Innovators

- In every society, there are some individuals who are more ready than others to accept new ways of life.
- If the new ways are seen to benefit those who have adopted them, the rest of the community may eventually come to accept them.
- General attitudes toward cultural change can then shift; new ideas may be welcomed as promising a better life instead of being regarded as a threat to established ways of doing things.

Contact with other cultures

- Contact with other societies is an important force for cultural change.
- Extension agents often travel outside their areas in order to study.
- People who leave their society, to study or work among another society, bring back ideas which may change their way of life and be adopted by other people in their society.
- The more people are exposed to new ideas, the more likely it is that change may be accepted by the society as a whole.

Communication

- Contact between different cultures is far more widespread than it used to be.
- On a more local scale, roads and railways have brought many changes to rural society.
- Travel has been made easier and more people can visit other places and learn different ways of doing things.
- Newspapers, radio and television can also bring rural people in remote areas into contact with the outside world.

- Education is another way of introducing people to the ideas, values and way of life of other societies.

Population growth

- There is a close relationship between population size, farming systems and other aspects of culture.
- Where there are not many people in an area and there is plenty of farming land, farmers may abandon their fields after two or three seasons and move on to fresh, fertile land.
- As population grows, land becomes scarce. New methods of farming have to be developed which allow fields to be cultivated year after year.
- Villages become permanent settlements. More elaborate houses can then be built because they do not have to be abandoned or moved every few years. As land becomes more and more scarce, individuals or families may move to other areas or to towns to look for work.

Economic factors

- Economic development leads to changes in many aspects of people's lives and culture.
- The growth of towns and cities and the development of mines and industries have created new kinds of work in new places.
- People leave their rural homes to find work.
- Elsewhere, on the fringes of the city, farming may become only a part-time occupation.
- They keep their farmland as an insurance against unemployment and as a source of food.
- The presence of large numbers of part-time farmers will affect extension.
- The growth of towns affects other aspects of culture, as well as the pattern of farming.

Social and cultural barriers to agricultural change

- Although cultures and social structures are always changing, the process is often slow.
- It is important that the extension agent be aware of the existence of such barriers and to take them into account in his work.

Respect for tradition

Many rural societies look upon new methods with indifference and sometimes with suspicion. Respect for elders often results in the attitude that the old ways are best.

- Farmers not only fear the unknown and untried but they also fear criticism for doing something different from other farmers.
- Village people may think that the extension agent is introducing changes to benefit himself.

Activity 3.2

1. Discuss on the challenges associated with animal health extension services in Ethiopia?
2. What are the roles of endogenous knowledge and culture of the community in health extension?
3. Explain why extension agents need to understands the social and cultural background of the farmers?

3.4 Extension and Cultural Knowledge Information Systems

Livestock owners have been living with their animals for generations and have built enormous experiences with animal health. They possessed detailed indigenous knowledge of animal husbandry and diseases. This knowledge is transferred from generation to generation as a component of the cultural heritage. Such cultural knowledge information sources are informal and also transferred informally. Eg. From parent to offspring by talking, demo, and practice.

Review Question

1. It is quite important to alert the mind of animal owners rather than only treating the physical body of the animal" Explain why?
2. Animal health care means care of the society. (True/False). Explain it?
3. As compared to Cops, what makes livestock research and extension difficult?
4. Among the different animal health teaching approaches (Formal training, teaching Animal attendants, case level Teaching and other alternatives) which one do you think more cost effective and reliable in Ethiopian context and explain why?
5. What are the topics or domain of knowledge need to be covered to improve the awareness of community about animal health?

CHAPTER FOUR

The objectives of this chapter are:

- To let the student understand the principles of Rapid Rural Appraisal (RRA)
- To compare and contrast the difference between RRA and conventional research

4. Rapid Rural Appraisal (RRA) Techniques

In reaction to the shortcomings of structured surveys, at the end of the 1970s and in the beginning of the 1980s a series of methodologies were developed to help outsiders understand rural life better in a short time: 'sondeo', rapid reconnaissance, exploratory surveys, informal methods, informal agricultural survey, etc. Their basic feature is 'organised common sense'. Finally, Rapid Rural Appraisal emerged as the most widely used methodology for outsiders to learn about rural life.

Rapid Rural Appraisal (RRA) is more commonly described as a systematic but semi-structured activity out in the field by a multidisciplinary team and is designed to obtain new information and to formulate new hypotheses about rural life. A central characteristic of RRA is that its research teams are multidisciplinary. RRA emerged in the 1970s as a more efficient and cost-effective way of learning by outsiders, particularly about agricultural systems, than was possible by large-scale social surveys or brief rural visits by urban professionals.

RRA was developed in response to the disadvantages of more traditional research methods, including: the time taken to produce results, the high cost of formal surveys and the low levels of data reliability due to non-sampling errors. It emphasized the importance and relevance of situational local knowledge, and the importance of getting the big things broadly right rather than achieving spurious statistical accuracy.

A core concept of RRA is that research should be carried out not by individuals, but by a team comprised of members drawn from a variety of appropriate disciplines. Such teams are intended to be comprised of some members with relevant technical backgrounds and others with social science skills, including marketing research skills. In this way, it is thought that the varying

perspectives of RRA research team members will provide a more balanced picture. Chambers describes the orientation of RRA as a "fairly-quick and-fairly-clean" appraisal, and as opposed to the fast and careless studies (he calls them "quick-and-dirty" studies) and the slow and excessively accurate approaches ("long-and-dirty").

RRA is also an approach for conducting action-oriented research in developing countries. To date RRA has mainly been used in the field of rural development as a short cut method to be employed at the feasibility stage of project planning.

The central idea is that a group of outsiders spends some time in a village and has informal and open dialogues with the people on (all) aspects of their daily life. The group works with (interdisciplinary) teams of 2-3 people who exchange their experience every evening and identify gaps in their understanding. Profiles are made of the respondents (e.g. old/ young/ male/ female /rich /poor /etc.) in order to be better able to understand their ideas. The following day, the composition of the teams is changed and the dialogue with the target groups is continued. A series of tools have been developed to facilitate the interaction between the team and the people. Most commonly used are:

- **semi-structured interviews**: an informal dialogue with farmers, loosely structured by a check list of issues the team wants to address;
- **dialogues with key persons or local experts**: the importance of the first is based on their (formal) position and of the latter on their expertise/skills;
- **transect walks**: walking with a (small) group of villagers along a transect, e.g. from the top of the hills to the centre of the village in the valley;
- **group interviews**.

Types of RRA

Exploratory RRA is when outsiders gain qualitative insight into the daily life of different groups in rural areas. Exploratory RRAs are mostly done during the identification stage of a project when the broad lines of a project have to be defined.

Topical RRAs are used to answer a specific research question; for example, what is the position of women in the community, or how do people cooperate in the community? Topical RRAs can be used during the initial stages of the implementation of a project. It is possible to use RRAs for monitoring purposes or in the evaluation phase of a project, but this is not common.

Activity 4.1

1. What is RRA?
2. What is the difference between semi-structured and structured interview?

The principles of rapid rural appraisals

1. **Optimizing the information**: In the context of cost-effectiveness, alertness, observation and imagination
2. **Offsetting biases**: through introspection, it is necessary to identify cognitive biases and deliberately balance those biases.
3. **Triangulating**: using more than one technique/source of information to cross-check answers. It also involves having team - multidisciplinary - members with the ability to approach the same piece of information or the same question from different perspectives.
4. **Learning from and with the rural people**: this means learning directly, on-site, and face-to-face, gaining from indigenous physical, technical, and social knowledge.
5. **Learning rapidly and progressively**: this means the process of learning with conscious exploration, flexible use of methods, opportunism, creativeness, restatement, and cross-checking, not following a blueprint programme but adapting through the learning process. A fundamental principle is the making of contact with the rural population in a learning process. This aspect must be one of the focal points.

It was usually conducted by a multi-disciplinary team, and its chief techniques included:

- Review of secondary sources, including aerial photos, even brief aerial observation
- Direct observation, foot transects, familiarization, participation in activities
- Interviews with key informants, group interviews, workshops
- Mapping, diagramming

- Biographies, local histories, case studies
- Ranking and scoring
- Time lines: obtaining quantitative data in a short time frame
- Short simple questionnaires, towards end of process
- Rapid report writing in the field.

The success of the pilot project conducted so far on RRA

Empower local communities by enabling them to articulate, document, legitimize, better understand and share their adaptive strategies;
Recommend policy formulations at local, national and international levels which strengthen successful adaptive strategies that have the potential to support sustainable livelihoods,
Contribute to sustainable livelihoods and poverty reduction in arid and semi-arid lands (ASALs) and other environments;
Empower Non-Governmental Organizations (NGOs) in Africa and other developing regions by engaging them in a project that can meaningfully link their field experience with communities on the one hand, to the development policy environment on the other.

Review Questions

1. What are the disadvantages of the conventional/traditional research methods?
2. Among the general principles of RRA theory, what by mean "Triangulating information"?
3. Discuss on the difference between RRA and PRA?
4. What are the two types of RRA?
5. List out the principles of rapid rural appraisals?

CHAPTER FIVE

The objectives of this chapter are:

- To let the student understand the principles of Participatory Rural Appraisal (RRA)
- To compare and contrast the difference between PRA and conventional research and development approaches

5. Participatory Rural Appraisal (PRA) Techniques

In recent years, an increasing number of analyses of projects have shown that participation by local people is one of the critical components of success in irrigation, livestock, water, and agriculture sectors. The terms "people's participation" and "popular participation" have now become part of the normal language of many development agencies. This has brought new dangers. The term "participation" has been used to justify the extension of state control and to build local capacity and self-reliance; it has been used for data collection and for interactive analysis.

Participation has often centered on encouraging local people to sell their labor in return for food, cash, or materials. Yet these material incentives distort perceptions, create dependencies, and give the misleading impression that local people are supportive of externally driven initiatives. This means that ***"more often than not, people are asked or dragged into participating in operations of no interest to them, in the very name of participation"***

Many interpretations of the term participation can be arranged into seven clear types. These ranges from passive participation, where people are involved merely by being told what is to happen, to self-mobilization, where people take initiatives independent of external institutions. It is clear from this typology that the term participation should not be accepted without the term participation should not be accepted without appropriate qualification. If the objective of development is to achieve sustainable development, then nothing less than functional participation should suffice.

What is Participatory rural appraisal (PRA)?

Participatory rural appraisal (PRA) is an approach used by governmental, NGOs and other agencies involved in international development. PRA refer to "**a family approaches**"). It shares the basic principles of RRA (quick, multidisciplinary, observations, etc.), yet now it is the local people who are encouraged to analyze their own situation and plan activities to improve it.

The approach aims to incorporate the knowledge and opinions of rural people in the planning and management of development projects and programmes. This was followed by a rapid growth in the development of methods that involved rural people in examining their own problems, setting their own goals, and monitoring their own achievements.

To ensure that people are not excluded from participation, these techniques avoid writing wherever possible, relying instead on the tools of oral communication like pictures, symbols, physical objects and group memory.

It encourages empowerment and decentralization. **Empowerment** means that people, especially poorer people, are enabled to take more control over their lives, and secure a better livelihood with ownership and control of productive assets as one key element.

Decentralization and empowerment enable local people to exploit the diverse complexities of their own conditions, and to adapt to rapid change.

The three basic pillars of PRA (and the basic differences from RRA) are:

1. The behaviour and attitude of outsiders, who facilitate rather than dominate;
2. The methods, which are open, group-oriented, visual and comparative;
3. Sharing of information, food, experiences, etc. between in- and outsiders.

For the tools used, two issues stand out:

1. ***'Handing over the stick':*** instead of outsiders trying to understand the *knowledge* of the local people, PRA tries to facilitate local people to develop their *capabilities*. They collect and analyse the data and propose actions to be undertaken.
2. ***Visualisation and sharing:*** local people convey their ideas and knowledge in a visual way. In verbal communication, outsiders dominate the dialogue more easily (via eye

contact, cross-checking, etc.) than in communication via visual aids. When a map is drawn by a stick in the soil all can contribute, and local people feel more confident than when outsiders try to draw a map on a piece of paper with a pen - a typical tool of powerful outsiders. Sharing also explicitly involves the food and shelter during the PRA.

The most commonly used tools are:

1. ***Participatory mapping***: a group of villagers makes a map of the community. The way they do this and what they find important provide good entry points for discussions about crucial aspects of village life;
2. ***Village transects***: together with a (small) group of villagers the team walks through the village (or another relevant area) and discusses the things observed;
3. ***Ranking***: people are asked to compare units (e.g. families /trees /crops) and to group them according to their own criteria. For example, via pair-wise comparing the importance of certain trees, people find out which criteria they use to assess the usefulness of these. Ranking is also used to stratify the local population, e.g. via wealth ranking. Both the results of the ranking and the criteria used provide entry points for further discussions.
4. ***Historical recalls***: the lifestory of families are recalled and the main events are used as reference points in the analysis of the present situation;
5. ***Calendars***: people indicate how things change over time, e.g. in which months they have to borrow money, when their children get malaria, when the rains are normally expected, etc.

Combining information obtained from all the tools provides the villagers with an explicit picture of their daily life. This not only helps them to start a discussion on their main problems and how to tackle them, it also boosts their self-esteem because they are able to make this analysis themselves.

Strong Points

1. PRA presents a major step forward from RRA. Local people do the analysis and plan for the future. Their own values, needs and priorities are the point of departure. They themselves develop criteria to classify aspects of their life. This not only leads to a better understanding of the situation (for both the in- and the outsiders) and therefore increases the chance for realistic plans, it also generates a much higher commitment of the people to the planned activities.
2. The many different perspectives on daily reality and the visualization offer good opportunities to go beyond the most obvious and dominant points of view in the community. The only warning here should be that too much attention to group discussions/ -activities might enable some groups to dominate the discussion.
3. To ensure that people are not excluded from participation, these techniques avoid writing wherever possible, relying instead on the tools of oral communication like pictures, symbols, physical objects and group memory.
4. It encourages empowerment and decentralization.
5. Empowerment means that people, especially poorer people, are enabled to take more control over their lives, and secure a better livelihood with ownership and control of productive assets as one key element.
6. Decentralization and empowerment enable local people to exploit the diverse complexities of their own conditions, and to adapt to rapid change.
7. The methodology is open to modification; everybody can develop new tools and new ways of organising things. This makes PRA applicable in a very wide range of situations. Indeed, it has been used in both rural and urban areas, both in developing countries and industrial countries, in agriculture, in health care and in social programmes.
8. PRA can also be used to collect data; local people are able to generate and/or collect reliable data which they themselves analyse and use for planning.

Activity 5.1

1. What is PRA?
2. What are the tools used in PRA?

Interview associated with PRA

Semi-structured interviews (SSI). This is guided interviewing and listening in which only some of the questions and topics are predetermined; other questions arise during the interview. The interviews appear informal and conversational, but are actually carefully controlled and structured. Using a guide or checklist, the multidisciplinary team poses open-ended questions and probes topics as they arise. New avenues of questioning are pursued as the interview develops. SSIs are a central part of all participatory methods.

Types, sequencing, and chains of interviews. Many types of interviews may be combined in sequences and chains. These include key informant interviews, by asking who the experts are and then putting together a series of interviews (e.g., men on ploughing, women on transplanting and weeding, shopkeepers for credit and inputs); and group interviews, which may be groups convened to discuss a particular topic (focused or specialist groups), groups comprising a mix of people whose different perceptions illuminate an issue (structured groups), casual groups, and community groups. The fourth element is the emphasis on diagramming and visual construction.

In formal surveys, information is taken by interviewers, who transform what people say into their own language. By contrast, diagramming by local people gives them a share in the creation and analysis of knowledge, providing a focus for dialogue which can be sequentially modified and extended. Local categories, criteria, and symbols are used during diagramming. Rather than answering questions which are directed by the values of the outside professional, local people can explore creatively their own versions of their worlds. Visualizations therefore help to balance dialogue and increase the depth and intensity of discussion.

Participatory mapping and modeling: This involves constructing, on the ground or on paper, maps or models, using materials such as sticks, stones, grasses, wood, cigarette packets, tree leaves, coloured sands and soils, rangoli powders, coloured chalk, pens, and paper. Great play is made of the issue of who holds the stick or pen. The person who holds the stick talks about what is most important to him or her. As maps take shape, more people become involved, and so want to contribute and make sequential changes. There are many types of maps: resource maps of catchments, villages, forests, fields, farms, home gardens; social maps of residential areas of a village; wealth rankings and household assets surveys on social maps; health maps, where the

health status of each family member is shown on each house, using coloured stickers or other markers (categories might include cases of malnutrition, ear infection, jaundice, and the like); topical maps such as aquifer maps drawn by the water diviner or soils maps by soils experts; impact monitoring maps, where villagers record or map pest incidence, input usage, weed distribution, soil quality, and so forth. Some of the most illuminating maps combine historical views with those of the present.

Seasonal calendars and activity profiles: Seasonal constraints and opportunities can be diagrammed month by month throughout the year. Ceremonies can be used as a cross-check so that names of months are agreed upon. People use pieces of stick, draw histograms in the dust or with chalk, or make piles of stones, seeds, or powders to represent relative quantities and patterns of rainfall, soil moisture, crops, labour, food consumption, illnesses, prices, animal fodder, fuel, migration, pests, income, expenditure, debt, children's games, and so on. Seasonal calendars can be drawn in linear fashion with twelve months to show a typical year or eighteen months to illustrate changes between years, or they can be drawn in a circle. Daily pat terns of activity can be similarly explored by charting typical activities for each hour of the day, amount of effort, time taken, and location of work. These can be compared for men, women, the old, the young, and others.

Time lines and local histories: Historical analyses have been found to be a good icebreaker for field exercises and include detailed accounts of the past. How things have changed, particularly focussing on relationships and trends. These include technology histories and review, crop histories and biographies, livestock breed histories, labor availability, trees and forest histories, education change, and population change. Legends and songs are valuable resources for exploring history.

Venn and network diagrams: Venn diagrams involve the use of circles of paper or card to represent people, groups, and institutions. These are arranged to represent real linkages and distance between individuals and institutions. Overlap indicates flows of information, and distance on the diagram represents lack of contact.

Matrix scoring and pair wise ranking.

These methods are for learning about local people's categories, criteria, choices, and priorities. For pair wise ranking, items of interest are compared pair by pair; informants are asked which of the two they prefer, and why? Matrix scoring takes criteria for the rows in a matrix and items for columns, and people complete the boxes row by row. The items may be ordered for each of the criteria (e.g., for six trees, indicate from best to worst for fuel wood, fodder, erosion control, and fruit supply); or Participants may put stones, seeds, or berries into piles for relative scoring.

Review Questions

1. What are the most commonly used tools of PRA?
2. What are the three basic pillars of PRA?
3. What are the steps involved in the process of participatory extension education?
4. Define decentralization and empowerment
5. Discuss on participatory mapping and modeling

CHAPTER SIX

6. Pastoralism

Pastoralism is a system that feats the lifestyle in arid and semi-arid areas. **Pastoralists** are peoples who live in these areas. Among the most notable pastoralists in Ethiopia are the Borana, Somali and the Afars around the southern, Eastern and North-eastern part to the country respectively. They have no permanent home and move with their herds within their traditional territory. Livestock is for subsistence and seasonal milk production. Yield per cow per day is 0.5-1 litre. The average land area per animal is from 5-10 hectares. Livestock include: cattle, sheep, goats and camels. Inputs include veterinary (supply of drugs and vaccines) services, water and road development. These areas sell young bulls to highland farmers (for traction) through exchange for cereals (mainly maize); and also contribute the highest number of animals for export.

6.1 Key principles of pastoralism

A. Sustainability

Adaptation to stressful environment, conservation of ecosystem diversity and mobility are the win- win components that make pastoralism sustainable.

B. Empowerment

Pastoralists need o be empowered to engage in decision and policy- making process, and to tackle marginalization, which is root cause of pastoral poverty.

C. Flexibility

Enhancing the economic and environmental sustainability of drylands cannot be achieved by substituting pastoralism with other, less flexible systems.

6.1.1 Key strategies of the pastoralists

The following strategies are used by pastoralists to manage the environment in a sustainable way while also (a) assuring a continuous food supply, (b) minimizing risks of people and livestock, (c) avoiding disease outbreaks and (d) containing social and political instability.

I. Livestock adaptation

Pastoralists own any of a wide range of indigenous livestock selected on the basis of survival and productivity, and are well adapted to the prevailing climatic conditions. Heir rangelands are also characterized by species diversity to optimize different range resources and conserve the ecosystem.

II. Mobility

Economically logical and environmentally essential, mobility is, in fact, the only way to make sustainable use of rangelands. The pastoral system is moved to fit the environment in order to make the best use of the available resources. Mobility enables pastoralists to take advantage of pasture resources that are only seasonally accessible, allows access to salt patches (critical for animal health and other resources and services, Moreover, thanks to mobility, pastoralists can obtain sufficient supplies of food, forage and water, or avoid disease outbreaks.

III. Diversification of livestock species and breeds

By keeping more than one species of livestock, pastoralists can generate a wider variety of livestock products and make better use of the available forage in different seasons, even in times of crisis.

IV. Reserve of rich – patch vegetation areas

Pastoralists set a side razing areas to use as a bank during the dry season or drought times.

V. Maximization of stock numbers

Such accumulation helps ensure survival of herds despite losses incurred during droughts or disease outbreaks. It also represents a method to accumulate food stock and marketable assets at the risk minimization stage- that they can eventually sell at the risk absorption stage, when all efforts are directed to sustaining the most valuable animals while the less valuable are used to buy food.

VI. Splitting of herds

Generally, this is a coping strategy aiming at reducing competition among herds for forage and water resources and optimizing pasture use. In times of crisis, it is mainly a prince of mutual assistance whereby pastoralists ensure optimal conditions and habits for the animals through reciprocal exchanges and support.

VII. Redistribution of assets.

Mutually supportive relationships among pastoral communities assure that, in times of need food, cash and labour are redistributed on a reciprocal basis.

6.2 Dynamics of Pastoral Systems in East Africa

Pastoral communities in the drylands of Eastern Africa are increasingly vulnerable to food and livelihood crises. Many reasons have been cited for this, including climate change and increased climatic shocks such as droughts and floods, man-made forces such as the ban on meat exports to the Gulf region and rapid population expansion overtaxing a finite natural resource base.

However, no other reason is more central to the problem than the persistent cycle of inappropriate policy and practice in the region.

Policies that are neither consistent with needs nor responsive to the uniqueness of the pastoral system are primarily to blame for pastoral vulnerability. The study on which this Synthesis Paper is based reviews current policies and practice towards pastoralism of governments, development agents and pastoral communities in the Horn and East Africa. It also analyses the impact of current policies and practice on pastoralism and pastoral livelihood vulnerability, and how policies influence investment in and the development of pastoral areas. The study also presents the considerable economic contribution of traditional pastoralism, as well as recommendations on how to secure a vibrant pastoral economy through positive policy approaches which would open up opportunities for diversification and alternative livelihoods.

Pastoral livelihood vulnerability: what is the problem?

The drylands cannot support sustained and reliable agriculture because of low and variable rainfall and high temperatures. Pastoralism, however, is extremely well suited to this type of environment. Pastoralists make optimum use of the drylands by practicing a mobile and extensive livestock keeping system. They move according to where and when fodder becomes available, and use different herd management strategies such as herd splitting, herd diversification and herd maximization to ensure that they spread the risk of livestock loss from droughts, diseases and theft. All the while, they make maximum use of the available vegetation without degrading the environment. These traditional strategies are underpinned by mobility and are thus only effective in a context that permits the practice of mobile pastoralism.

Thus, to the extent that development policies promoted by governments and donors restrict mobility, they effectively increase the vulnerability of pastoralists to natural and man-made shocks. Many factors undermine the resilience of pastoralists to climatic shocks and other drivers of change and increase their vulnerability. It is no wonder that, although diverse initiatives are being implemented to help pastoralists cope and prosper, more and more of them find themselves unable to remain within the pastoral production system. Instead, growing numbers of pastoralists are falling out of pastoralism every year, and more and more have to depend on emergency relief

food provision for survival. Different explanations have been advanced for the increasing vulnerability of pastoralists. Population growth in pastoral areas has created pressure on land. Climate change has increased the frequency of droughts, floods and livestock diseases. However, these natural factors only exacerbate the effects of a harsh policy and legal environment that is focused on 'modernising' and settling pastoralists. The increased vulnerability of pastoral livelihoods to shocks and other drivers of change is in many ways a function of the cumulative effect of these policies.

The inappropriate policy environment is a result of two critical and interrelated factors – a **knowledge gap** and a **power imbalance**. Unable to sufficiently articulate the rationale of their livelihood and to organise themselves to influence policy, pastoralists have been absent from national, regional and international policy processes. The result has been inappropriate policies which undermine pastoralism. Driven by their misperceptions of pastoralism and their disapproval of a way of life that is not their own, policy-makers have persisted in inappropriate policies and interventions. Many do not understand and appreciate the rationale of pastoralism – why pastoralists do what they do – or their significant contribution to national economies. As a result, they see critical aspects of pastoralism, such as mobility and reliance on indigenous knowledge, as backward and inconsistent with the imperatives of a modern state and economy.

There is also a power imbalance between pastoralists and other livelihood groups in the countries of the Horn and East Africa. This manifests itself in the absence of pastoralists in key policy-making frameworks and their limited influence on policy processes and policy institutions. The power imbalance is explained in part by the fact that pastoralists tend to be minorities in most of these countries, often living in geographically remote areas away from the capital cities and the centres of political and economic activity, with few representatives in national politics or the civil service. The knowledge gap and power imbalance combined contribute to inappropriate policies.

Responses to addressing increasing pastoral vulnerability have been equally inappropriate, with most actors focusing their attention on the provision of emergency relief. Unfortunately, without proper investment in the development of pastoral areas – to expand and create opportunities

within the pastoral production system – relief keeps pastoralists hanging on the edge of a cliff from which many fall off, into destitution and dependency. Without adequate focus and strategies for comprehensive development in pastoral areas, humanitarian efforts to help pastoralists are akin to trying to clean up downstream pollution without addressing the root source upstream.

To reduce pastoral vulnerabilities, programmes and projects in pastoral areas should focus on development twinned with relief aid. This calls for a change in practice and policies, with policies and laws geared towards promoting investment in pastoral areas.

Laws and policies on pastoralism in Kenya, Uganda and Ethiopia

Governance is at the centre of societal development. Policy plays a critical role in guiding the choice-making process, identifying the problems to be addressed, establishing parameters and putting in place structures and institutions. Policy should be designed in close consultation with all stakeholders. Where policies are designed without the informed participation of the target groups and without taking into account their unique realities, their impact is usually negative.
The following four categories of policies and laws that impact on pastoral livelihoods have been identified.

Policies on governance

These include constitutions and policies on decentralization. The constitutions of Kenya and Uganda do not have specific provisions on pastoralism and pastoralists, but the Ethiopian constitution guarantees the right to grazing land for pastoralists and the right not to be displaced from their lands. However, experience has shown that, even where there are positive policy and legal stipulations, there is always a challenge with regards to actual implementation and enforcement. In the case of Ethiopia, statutes have been enacted which appear to derogate from the guarantees contained in the constitution.

Decentralization policies in Uganda and Ethiopia provide opportunities for pastoralists to influence decisions at the local level. In Kenya, the management of devolved funds such as the Constituency Development Fund (CDF) and the Local Authorities Transfer Funds (LATF) are an opportunity for pastoralists to direct development funds to areas that are of relevance to their livelihoods. The extent to which pastoralists are able to take advantage of these opportunities ultimately depends on their capacity for self-organisation and mobilisation and their ability to make local governance institutions accountable.

Policies on land and natural resource management

Productive and sustainable pastoralism requires access to and security of land tenure. Failure to recognize communal and pastoral land tenure in laws and policies, and the little regard in which customary land laws are held within the judicial system and in land administration and management, have led to governmental abuse of the land rights of pastoralists. Pastoral lands continue to be appropriated for other uses.

However, positive steps are being taken in recognition of pastoral land rights, though the application of these positive developments has been very slow. Uganda has recognized the issues of land tenure security through the provisions on community land in the 1998 Land Act and in the Land Sector Strategic Plan of 2002, which identifies pastoralists as a group with insecure land rights. As has been stated, Ethiopia has recognized pastoral land rights in the constitution at federal government level, although statutory provisions such as the Rural Land Administration and Land Use Proclamation seem to undermine opportunities for communal land-holding. In Kenya, the Draft National Land Policy (DNLP) offers new hope for pastoralists if adopted. The DNLP recognizes pastoral land tenure as a separate tenure category and enjoins the government to enact legislation for it. It also provides for community land rights to be secured through a devolved land administration system that ensures communities have a say in decisions about land allocation and use at the local level.

Pastoralists and pastoral livelihoods are also affected by policies and laws on natural resources such as water, forests, wildlife, wetlands and environmental conservation. Often, the operation of

these policies constrains pastoralist migration and access to resources such as dry-season grazing grounds and water.

Policies on economic development

These are focused on the commercialization and general modernization of agricultural and livestock production, and are largely unhelpful for pastoralists. However, economic development policies have begun to recognize the need to support pastoralism as the basis for economic development in the drylands.

Kenya's Economic Recovery Strategy for Wealth and Employment Creation 2003–2008 (ERS) devoted an entire chapter to the development challenges in the drylands. Uganda's Poverty Eradication Action Plan (PEAP) acknowledges the need to support pastoralism, as does Ethiopia's Plan for Accelerated and Sustained Development to Eradicate Poverty (PASDEP). However, the positive statements in these policy documents are rarely translated into actions and strategies that deliver on their promises.

Policies on peace-building, disaster management and security increasingly touch on the interests of pastoralists. The endemic conflict that characterizes pastoral areas has focused the attention of governments and other actors on these regions. In the post-9/11 era and the global 'war on terror', the Horn of Africa has become the focus of interventions, especially by the US government, aimed at checking the spread of Islamic fundamentalism.

These interventions are bringing resources and opportunities into pastoral areas that, if harnessed, could help address key challenges to livelihoods and development. The increasing recognition of the potential role of traditional institutions in peace building and conflict management is also focusing attention on pastoral communities and their institutions as vehicles for promoting sustainable peace and development.

6.3. Past policies and current improvement with regard to pastoralism

Ethiopia has made progress since 1991 in policy support for pastoral areas, especially in the delivery of veterinary services, drought cycle management, private sector support, and export trade. These all have been major improvements over previous political regimes since the 1970s. However, in other sub-sectors policy and legislative gains often have been compromised by weak implementation and contradictory strategies. The complex interplay of written policies and what actually occurs in the pastoral lowlands often is contradictory, and results in increased livelihood insecurity and ecological problems as we have shown in the case of irrigation development. Thus, the overall policy environment for pastoralism in Ethiopia still exemplifies many misunderstandings about pastoralism and its importance to regional and national economic growth.

The current progress in understanding pastoral economies and their contributions to welfare and economic growth also is still at odds with official views of pastoralism as an economically arcane form of production and mobility as a cause of conflict and environmental abuse. The lack of basic data on key livestock-based activities, such as domestic and regional trade, contributes to misunderstandings of pastoralism, as well undervalues its contributions to the Ethiopian economy and GDP. By failing to acknowledge the contribution of breeding, milk and other animal products, it is conservatively estimated that pastoralism‘s official contribution to Ethiopia‘s GDP is undervalued by more than 50 percent.

Despite the impressive amount of empirical work on pastoral ecology and economy that has been carried out in the country over the past 30 years, there is a strong disconnect between current understanding of pastoralism and official premises about pastoralism that informed key policy decisions. By distinguishing between ‘written’ policies and guidelines and those that have actually been consistently implemented in practice, the paper shows that there are certain policies ‘on paper’ toward pastoralists (including women) and pastoralism; many of which are sound in principle; that remain un-implemented to date. In some cases, official policies formulated since 1991 are contradicted by what actually has or has not happened in practice. This distinction is extremely important since many area-based policies often strongly support non-pastoral

activities, such as large-scale irrigation and dryland farming, and non-pastoral populations activities that can actually undermine pastoralism, the key economic activity in all of the country‘s pastoral regions.

Activity 6.1

1. What are major policy issues of pastoralist development?
2. What are the current imprudent in the strategy of pastoral community development?
3. Pastoral livelihood vulnerability: what is the problem?

6.4 Pastoralism as a “system” regulated by ecology and complex modes of social, political and economic organization

The Extensive Pastoral System: Lowlands below 1,500 metres are arid or semi-arid. Here livestock rearing is the mainstay of people, and livestock and livestock products provide subsistence, either directly as milk, milk products, meat and blood, or indirectly in the form of purchased cereals through sales of animals; crop production is limited. This production system is extensive; feed and water supply are achieved through either constant or partial herd mobility. A strong traditional built-in system or social laws maintain a sustainable resource management, govern this system. The pastoral lands of Ethiopia are in the border regions and the ethnic groups are often trans-boundary. For example: Afar pastoralists are found in Eritrea, Ethiopia, and Djibouti; Somali pastoralists of eastern Ethiopia are also found in Djibouti, Somalia, and Kenya, and the Borana homeland is between Ethiopia and Kenya.

A nomadic pastoral system denotes an economy that derives the bulk of its food supply from livestock, using a great variety of herding practices, on natural pasture, provided that the system involves some degree of mobility. A transhumant system allows members of the communities to practice some crop production in settlement areas. Despite the attempt to integrate farming with livestock around settlement areas, crop production has remained opportunistic. Pastoralism presupposes a sustainable balance between the human and animal population and the pasture. Such a balance is precarious and rarely occurs, even with highly developed indigenous social organization.

Pastoralists maintain livestock under environmental conditions of risk and uncertainty **using traditional strategies**. Such strategies in Ethiopian nomadic and semi nomadic systems include:

- Maintenance of multi-species herds and supplementation of pastoral resources with agricultural by-products;
- Herd splitting into spatially appropriate units, to minimize the effect of localized overgrazing and over-browsing, disease, and other environmental vagaries;
- Establishment and maintenance of social systems for sharing, borrowing, giving, and conservation of common resources. There are well-defined and extensive institutional frameworks for sharing resources and rehabilitation of members' herds after a time of crisis;
- Maintenance of as large herds as possible to minimize the chance of losing all and maximize the chance of having some left over after hazards;
- Reduction of the number of household members during bad times, such as severe drought and disease outbreaks, by sending away all able-bodied people, not required in the system, to work in agropastoral and other agricultural areas.

Extensive grazing systems: Pastoralists' resource management is traditional; regulations are decided by the local community. Traditional rulers decide from collective choices taken after discussion. The rules structure individual and collective choice, which allows the herders to manage grazing as common property. Decisions are made with a high level of community involvement of men, aimed at efficient and sustainable use of resources.

An important point to mention is their tree management rules. Trees have high value to **pastoral people**; they are used as fodder, as food in periods of stress and are important for shade. Pastoral people are not allowed to lop trees when there are other fodder sources available, i.e. grass and bush. They do not cut trees for firewood but gather dead wood, mainly along perennial and seasonal watercourses. **Pastoralists** are never allowed, and do not cut fruit trees. Selected men decide tree management rules and a man from each extended household is elected to uphold them; he gives permission to lop trees when needed.

Pastoralists know how to select the most appropriate seasonal grazing and browsing areas, and protect areas which have already been grazed. They make decisions on a daily basis in their use of natural resources. They do not have complex rules of management and are only concerned with the key resource; such as dry season feed areas. Pasture production on such land is low. This makes the pastoralists survival subject to unpredictable natural events that force them to make agreement with highland people to have seasonal access to each other's grazing and natural resources. The widely known rules of grazing management are:

- Conservation of grazing area
- Moving animals during dry periods
- Demarcation of grazing lands and settlement areas
- Division of the herd into mobile grazing ('fora') and home-based grazing ('warra') groups
- Migration of family members
- Bush control (burning), and
- Shifting cultivation

Pastoralists experience strong seasonal fluctuation in feed availability and quality; an increasingly popular practice is the establishment of a special enclosure where standing hay is surrounded by thorn-bush fence to be used in the dry season for feeding immature stock and lactating cows. In addition to feed storage, this allows optimal plant growth and helps the pasture condition as it allows both seed setting and plant re-growth. During good rain years, feed is most available in the rainy season and then markedly declines in the dry season, so haymaking is also becoming common, especially by partially settled pastoralists. Crop residues are also used in areas where there is cultivation.

Herd Management: Livestock breeding is based on local knowledge; breeding stock are selected for their ability to survive periods of temperature fluctuation, shortage of water and fodder, insects and diseases. Selection also considers the amount of milk the animal supplies as well as fertility. Lowland pastoralists practice herd splitting, which is dividing their herd into separate units depending on type, age, sex and productivity. Small ruminants are usually separated from cattle and camels based on different requirements of fodder, water, and salt.

Camels are herded separately mainly because of their lower watering frequency, and long movement in search of fodder. Herders cooperate to look after split herds of related families.
Herd composition is designed to meet the people's needs and fit the environment. The arid zone natural resource base is highly unpredictable and the people keep multi-species herds. The system displays a relatively high degree of flexibility. Cattle and sheep which were part of the Afar herds are now decreasing in numbers, as more emphasis is put on goats and camels. Camels were rare in the Borana, but now are becoming very common.

Most of these people are **nomadic**; a few have settled permanently (mostly transhumance) and mixed with other ethnic groups and practice crop and commercial activities. Camel and goat keeping is the main economic activity of the pastoralists. They have also been engaged in salt-caravans for many centuries.

Cattle Management: Pastoralists manage cattle in a traditional pastoral fashion. According to Coppock (1994) suckling calves are kept apart from their dams except when used to stimulate letdown of milk at two milkings per day. Bulls commonly run with cows all year so mating is uncontrolled and periodicity is influenced by seasonal fluctuation in nutrition. Cows are milked early in the morning and evening. Most grazing time is spent on grasses with less time spend on browse.

Where water and grazing resources permit pastoralists lead a semi-settled existence. The household may remain sedentary throughout the year, or a succession of years, and family residences in a given well area may last for generations. Cattle are herded either as home-based groups or mobile grazing groups. Herd splitting is done depending on the condition of the resource base, availability of labour, sex and age class of animals and whether cows are in milk or dry.

As described by many researchers the primary purpose of the herd splitting system is to distribute animals away from the home-encampment area during times of restricted forage and water availability. Strong and less productive animals are sent with mobile grazing herds managed by older boys and young men. At the other extreme home herds are composed of

milking cows and some weak or sick yearlings that return to the encampment each night. These are kept within closer grazing orbits whose radii vary depending whether the day is used for grazing or both for grazing and watering.

The mobile grazing herd is composed of dry cows and males of diverse ages and ranges widely. The composition and size of home based herds and mobile grazing herds are dynamic across seasons, type of average rainfall, and dry or drought years. Larger and more heterogeneous home based herds may characterize years of high rainfall, while the inverse holds for mobile grazing herds. Both home based and mobile grazing herds are watered once every three to four days during dry periods. This is considered as a management adaptation to minimize labour required to raise water from deep wells.

Sheep and Goat Management: Pastoralists keep large flocks of sheep and goats for subsistence, income, breeding, restoring wealth and social prestige. At a subsistence level, sheep and goats are kept for occasional slaughter for meat. At present goats are kept for their milk, especially as food for children in the dry season and for adults in times of shortage. Sheep are rarely milked. Sheep and goats are sold regularly in exchange for small commodities and food items. Offtake is mainly males while the females are reserved for breeding. The nomadic pastoralists' sheep and goats are to a high degree drought resistant and well adapted to arid range with bush vegetation. Goats are highly productive and used for milk, butter and meat. Milk is very important for the nourishment of children. Skins are used for storing butter, for churning milk, as water buckets, for storage of cereals and for sale.

The age of goats first kidding is 8 to 12 months; kidding interval is six months. Four to five days old male goats (kids) are often given to guests as a gift. Some newborn male goats are slaughtered after a few days, to increase the amount of milk for the family use. In the dry season all the new kids are slaughtered, because of fodder scarcity and female goats would be unable to survive with suckling kids.

Some male sheep and goats are kept for reproduction and meat. At the age of four-five years, male sheep and goats are castrated for fattening, and called 'sanga'. They grow fast and provide

good meat; sangas command a high price in local and export markets and are preferred for ritual occasions: holydays, when a woman has given birth and during circumcision ceremonies.

Camel Rising: Camels are of great interest for the lowland peoples and pastoralists in particular; they are uniquely adapted to the lowlands of Ethiopia, and contribute significantly to the food security of pastoral households. Their most important use is for milk and transport of household and commercial goods. The protein, fat and vitamin-C content of camel milk is vital for pastoralists living in an environment that lacks vegetables. Pastoralists use camels for travel and/or commercial operations; domestic uses include carrying grain, commodities from market, large quantities of drinking water from wells both for people and calves in dry season; they are also are used for ploughing. Most pastoral campments have at least one camel.

The preferred number of female or male camels that are kept in different localities varies according to the proximity of the communities to commercial goods sources such as saltpans. The market value of a camel varies from US$ 175 to US$ 200. Members of different communities exchange males for transport and female for milk.

Ethiopian camels are raised under traditional management; there are few studies on camel husbandry. The multiple changes in the dry land environmental and lack of veterinary services coupled with low reproductive performance make camel raising difficult; it is a slower process than goat raising. Sexual maturity is at four to five years and they usually calve once per year.

Calf management is considered very important by herders and is given considerable attention at home or in the encampment. Herders consider sufficient milk supply, provision of water during dry seasons, good pasture and good control of parasites as important calf care measures. Herd splitting to reduce competition for forage, water and salt between herds optimises resource utilization; this strategy also guarantees continuous supply of milk for the families, and meets both the needs of calves and the family. The management of the herd attempts to ensure a sustainable flow of benefits from camels to households. With limited resources, investment on calf rearing by the pastoralists is relatively intensive. Keeping them in confinement during most of their first year is important in helping calves to thermo-regulate in what can often be a cold

and windy environment during rainy periods; this also minimizes risk of predation. Women regularly remove manure from calf pens and attend to health problems such as removal of ticks using kerosene and traditional remedies to heal wounds and internal ailments.

The importance of salt for camels is well known among herders; camels depend on salty plants, salty soils, and salt supplements. Herders recognize camels with salt deficiency symptoms and give them supplements. There is a occasional salt supplementation where salty plants and soils are scarce.

Traditional breeding management considers the selection of breed female and male camels, and controlled breeding. All females are considered fit for breeding; selection is mostly focused on bulls. Once a bull is selected for breeding he is used as long as possible, but sires are kept only for five to seven years in a herd. Letting a selected bull browse with breeding females controls breeding and all unwanted bulls either browse separately or are castrated.

6.5. Challenges and Options for Pastoralism

6.5.1 Limitations of ruminant livestock production

It has been long recognized that the limitations to increasing livestock development (increasing production and productivity) in Ethiopia are multidimensional. Constraints can be grouped into socio-economic and technical limitations. Socio-economic constraints encompass policy issues, land tenure, institutional, marketing and budgetary. Major technical constraints include health, feed and genetics.

Socio-economic Limitations

Policy issues: Livestock is an integral part of the national resource. There is need for an environment policy for natural resources to be used in ways which allow sustained production in the long term. Livestock and natural resources management are influenced by many aspects of

government policy, ranging from economic and social to political. The major policy issues that are relevant to ruminant livestock production are:

- Absence of livestock policy
- Pricing policy
- Community organization and participation

Land tenure: In the past discriminatory allocation of land in favour of collective farming and absence of users' right discouraged small farmers from investing in livestock and land improvement. Equally important was the discouragement of private land acquisition, which prevented the emergence of private livestock farming. At present land scarcity in the highlands is leading to development of the less productive alpine and semiarid pastoral areas.

Infrastructure: Ethiopia has one of the lowest densities of roads of any country, thus forcing cattle in almost all cases to trek long distances. Marketing of live animals and meat is constrained by inadequate infrastructure and transport facilities. When stock are trekked, the absence of stock routes, resting areas, watering and feed points results in substantial weight losses before they reach consumption or market areas. Also, inadequate input distribution systems and credit facilities contribute to the poor performance of the livestock sector. Lack of educational infrastructure for training and extension is another important issue that needs to be addressed.

Services: As important as the infrastructure is agricultural services. Inadequate services and livestock technology packages emanating from the weak link between extension and research, absence of beneficiary participatory planning and agricultural training to the changing needs of the country are some of the major institutional constraints.

Finance: Insufficient recurrent expenditure in government services has been a critical constraint. Inadequate staff transport, fuel, repairs and maintenance, vehicles retained beyond their economic life, frequent shortages of drugs, vaccines, and semen are some of the problems.

Marketing: The marketing process in general follows a three-tier system with primary,

intermediate and terminal markets through which marketable animal and animal products pass from producers to small traders and on to large traders and/or butchers. However, most producers sell their stock and livestock products at local markets directly to consumers or small traders at relatively low prices. The marketing information available to producers is unreliable and inadequate. Without exception markets are open places in villages and towns. Distance from the market, poor trekking routes and lack of holding grounds create unfavourable conditions for producers forcing them to sell their stock at low prices. Marketing of livestock is not determined on the basis of their weight and quality, but by direct tiresome bargaining between buyers and the sellers. Due to these unfavourable marketing systems and the discouraging price on the producers' side they are not encouraged to improve the quality and the off-take of their animals.

Technical Limitations: Ethiopia's livestock productivity is below the African average. Total herd offtake is estimated at 7 percent annually for beef and at 33-36 percent for sheep and goats, with corresponding carcass weight of 100-110 kilos and 8-10 kilos respectively. Cows do not reach maturity until 4 years of age, calve every second year, and produce only 1.5 to 2 litres of milk daily over a 150 to 180 day lactation. As a result per capita consumption of meat and milk is low. Poor health, feed shortage and low genetic potential are the main constraints to increased livestock productivity in the country (ILCA, 1991 and MoA- NLDP, 1998).

Pests and Diseases: Animal disease is a major constraint limiting the production of indigenous stock, by restricting the introduction of more productive animals, new technology and constraining the country from entering the high priced export market. There are epidemics of infectious diseases with high rates of mortality, which could be controlled by vaccination; there are also parasitic, and vector born diseases. Trypanosomiasis and internal parasites are very severe, for which effective, easily administered inexpensive control or treatments have not yet been developed Thus, livestock diseases on their own and interacting with nutritional and productivity problems cause high morality, morbidity and restrict production in potentially productive areas.

Feed Quantity and Quality: To feed the increasing human population by continuous cereal growing, available grazing is on the decline. Feed shortages and nutrient deficiencies become

more acute in the dry season in both the highlands and lowlands. Studies have indicated that there is a deficit of about 12,300,000 tonnes of dry matter in Ethiopia. For various reasons, crop residues and agro-industrial by-products are not adequately utilized. Cultivation of forage is not widely adopted and commercial feed production is not developed.

Livestock Breeds: the genotype of Ethiopian livestock has evolved largely through natural selection influenced by environmental factors. This has made the stock better able to withstand feed and water shortages, disease challenges and harsh climates; but the capacity for high levels of production has remained limited. The non-market oriented subsistence animal production is incompatible with the farming system of most agro-ecological zones. Crossbreeding and breed substitutions have been done for a more rapid increase in milk production in high potential areas. However, their applicability in the low potential areas, where the ability to survive is the major concern, needs more detailed studies. There are some important indigenous breeds of livestock with a remarkable feature; the lowland breed of cattle (e.g. Boran) and Sheep (e.g. Somali black headed) are often regarded as superior in terms of size, durability, and productivity and/or consumer preferences. However there are few detailed studies on these and other indigenous breeds.

Recurrent Drought and War: recurrent drought and the previous prolonged civil war hampered programmes and projects. Infrastructure was destroyed; lives and properties lost due to war and government changes. The inability to strengthen the already existing production is another important limitation that needs to be addressed. Over the decades following the 1974 revolution, the country's economy grew slowly at a rate of about 2.5 percent per year. Growth in the economy as a whole was clearly dependent upon the performance of the agricultural sector, which accounts for 40 percent or more of the GDP. The drought of 1983/84 followed by the more severe drought of 1984/85 caused a massive decline in agricultural output and a dip in the economy as a whole. The subsequent recovery was interrupted by the droughts of 1987/88 and 2002/3. As the economy of the country is based on agriculture, its weak performance has had a direct impact on other sectors. The overall economic slow-down compounded by war and drought resulted in frequent declines in GDP. The GDP drop in 1991/1992 was 5 percent, however there was a sharp increase to 12.3 percent in 1992/93. In 1993/94, the rate of growth

was a more typical 1.7 percent. The huge drop was due mainly to drought. In subsequent years annual growth of GDP were 4.9 percent and 7.6 percent respectively. These were attained due to the prevalence of well-timed and good rainfall accompanied by favourable agricultural and economic policies. The inflation rate in 1992/93 was 10 percent; 1993/94: 12 percent; 1994/95: 13.4 percent and in 1995/96: 0.9 percent.

Bush encroachment: current land tenure does not allow control over community grazing land. Mismanagement coupled with disregard of indigenous knowledge makes bush encroachment one of the major problems in many pastoral areas. Introduction of invasive species without a sound knowledge of the plant and the recipient environment has created great rangeland problems in many lowlands of the country. In the dry southern savannahs, where for centuries episodic climatic events and the use of fire regulated vegetation dynamics, the natural balance between grasses and trees has shifted and bush cover has become a major threat to pastoral grazing management. On 40 percent of the grazing lands of southern Ethiopia, bush cover exceeds 40 percent (Coppock, 1994). *Acacia drepanolobium*, *A. brevispica* and other *Acacia* spp. are the dominant encroachers of southern Ethiopia, but the introduced *Prosopis juliflora* is the most frequent plant mentioned as an invader in eastern rangelands.

6.5.2 Opportunities for intensification of ruminant livestock production

A possible development opportunity is based on domestic demand for both livestock products and draught power in the face of a growing population that will remain agrarian for a long time to come. Growth of the rural population is high by Sub-Saharan African standards and the demand for livestock products will increase. The possibility also exists for the country to regain its place in the export trade, particularly in Gulf and Middle East countries where its stock, especially sheep and cattle, have preference and established demand.

Despite the poor performance of livestock in the past, the country's livestock, biodiversity and land resource base retain the capacity for improvement. The very large livestock population, highly adapted to the diverse agroconditions of the country, will be the basis for an increased supply of animal products and work input that is crucial for the upkeep of a sustainable

agriculture. Improvements in the excessive wastage due to disease, malnutrition, reproductive inefficiency, marketing and price structure will immensely improve performance.

Improvement of the genetic potential of indigenous ruminant livestock particularly for the dairy industry is an area where private and small holder interests should be growing, though feed will remain a major constraint. Semi-intensive and backyard poultry are likely to develop on a modest scale because of increasing prices for milk and meat. Improvement of feed quantity and quality is another opportunity; there is great potential of improving both the quantity and quality of pasture and forage. The Ethiopian Agricultural Research Organization (EARO) has developed feeding systems and addressed researchable areas with regard to feed and nutrition to make sound livestock production possible. MoA recently initiated work to improve feed quality and quantity through various programmes aimed at:

- Improvement and management of natural pasture
- Improvement of crop residue quality and use
- Development of improved pasture and forage, and
- Production and distribution of pasture and forage seed.

Though there is no reliable and comprehensive information, MoA reported that more than 100,000 hectares of degraded grazing land has been rehabilitated, in four years, through a well-coordinated grassland improvement programme. However, efforts up to now are insignificant compared with the total area of degraded land, and the effort needs to be continued and strengthened further.

Improving feed supply is possible if backyard forage production, under-sowing, oversowing and growing improved pasture and forages are widely adopted. Production of forage seed by contracting small holders has shown potential as a way of improving seed supply. As crop farming becomes more intensive, crop residues would become a major feed source; another area is improving the quality of crop residues and efficient utilization of by-products. For the lowland pastoral areas there are various opportunities for improvement of grazing management. These include:

- Encouraging the establishment of a regular monitoring network which is gender-sensitive in order to study and observe pasture conditions and trends;
- Encouraging the implementation of regular monitoring of productivity and management problems for livestock and grazing land;
- Recognizing and strengthening the traditional knowledge of the pastoralists, both men and women, and forms of grazing management practices by:
- Encouraging and strengthening the traditional rules of grazing management, demarcation of settlement areas and herd mobility;
- Strengthening the traditionally widespread practice of feed conservation in the form of 'Kalo'(traditional hay);
- Encouraging fodder banks through hay and other forms of feed conservation,
- Investigating and encouraging selection and supplementation with leguminous trees like Acacia and other forage legumes for dry season feeding;
- Setting up a regulated scheme for using fire to control bush and improve animal production and health through reducing tick infestations and improving forage quality. This requires policy development and community participation;
- Making a detailed analysis of pasture deterioration to ascertain its extent; and
- Investigating more appropriate grazing management systems.

Other opportunities can be sought in disease prevention and control. Even though there is no epidemiological data on most livestock diseases and disease reporting is below the required levels, successful control and eradication of Rinderpest is an indication of the proper designing and implementation potential of the country. If support to similar programmes of priority diseases is given the associated economic loss will be minimized and improved access to potential export markets may be possible.

Activity 6.2

1. What are major challenges of pastoral community in Ethiopian environment?
2. Among the strategies used by pastoralists, what does diversification of livestock species implies?

6.6. Pastoral Production area and CAHWs

Farming system in Ethiopia is by large dominated by smallholder extensive system where mixed and pastoral production is within the system. Pastoral and agro-pastoral communities, who are marginal to most social facilities, produce a considerable potential of livestock resources. However, animal health is a major constraint to livestock production in these areas of the country. Besides genetic, management and environments, diseases negatively influence livestock production. In addition, the biogeography of arid and semiarid environment favors the occurrence, transmission and spread of most important animal diseases.

Public and private veterinary services are often not readily available in pastoral/agro-pastoral areas and the service doesn't sufficiently reach them particularly during migration seasons. The government capacity is not in a position to enable the sector to serve at full service rendering capacity. Situations are also not attractive for trained manpower with modern veterinary knowledge to provide service in marginal areas of the countries (less willingness to work in remote areas).

The idea of mobile veterinary service, which is only in the professional's mind, is not yet practiced. On the other hand, all herd owners attempt treatment with inappropriate drugs purchased from shops and open markets. These drugs may have been expired, under dosed, distorted or those indicated for human like tetracycline and penicillin, which can have more side effects than benefits. The cumulative effect of these factors may badly threat livestock keepers for whom animals are the prime source of income. Therefore, promotion of CBPAHCS is necessitated to use as an alternative means to fill the gaps of government's veterinary services in the remote and marginalized pastoral and agro pastoral areas of Afar region, Somali region, and pastoralist area of SNNP and Oromia region (Borana, Guji, Bale, Hararghe and East Shewa lowlands).

In response to this demand, efforts have been made by Governmental (GO) and Non-Governmental Organizations (NGO) to solve the problem by training and equipping community

members as Community- based Animal Health Workers (CAHWs) with aim of promoting problem oriented CBPAHCS in a sustainable way, in vast pastoral/agro-pastoral communities.

6.6.1 Community based animal health service delivery system

Experiences from these programs indicate that, by incorporating existing traditional knowledge, CBAHW programs encourage the participation of the local communities in the design and delivery of animal health care services. The question asked by most observers of the newly introduced strategy of Community-based delivery of Animal Health Services is that "**Is it really a viable option in improving primary veterinary services in pastoralists production systems?"** The answer to this question is a big **Yes**, and this can be illustrated by the following examples:

- It has been shown in Sudan that a well co-ordinated large scale Community- based system can form the basis of improved services delivery in conflict zones.
- The delivery of livestock health services in many developing countries is undergoing restructuring.
- One publicized initiative to refocus service delivery has been the introduction of community – based animal health workers (CBAHWs).
- This involves training community–selected representatives in basic animal health care and livestock production techniques.
- The objective is to supplement and support the existing professional system for delivering such services to communities in marginal areas.
- In implementing these programs, different approaches have been adopted in different countries, presumably to tailor them to the specific needs of livestock farmers in varied environments.
- Although numerous terms have been used to describe them, share similar features and goals such as:
    - ✓ Selection of individuals for training by communities within which they work;
    - ✓ Technical training in animal heath takes a short period, usually less than a month.

- ✓ Low- cost strategies concentrating mainly on important livestock health and management issues of the farming community; and
- ✓ Payment for services provided comes directly from clients.

- In dry land areas of Kenya community – based projects demonstrated substantial cost-benefit through the treatment or the prevention of a few livestock diseases.
- In Afar region of Ethiopia, the Community- based delivery strategy has played an essential role in Rinderpest eradication.
- And here are many other positive examples that are being implemented in the Karamoja and Turkana regions.
- The new observers still ask '**Who are the best community – based workers?**
- The answer to this latter question can become more clearer by first examining the unique characteristics of the areas where these people operate in and the reasons why it become inevitable that they were the best option to work in these areas. These are outlined below:

The Unique characteristics of the pastoralists Areas Where CAHWs Operate:

1. These are areas with a harsh climate and rugged topography all of which restrict the use of land o extensive grazing of natural pastures rather cultivated pastures and crops.
2. They are remote, largely inaccessible by road and distant from **public- and private-sector centralized services.**
3. The pastoralists **move their herds** sometimes over large distances to take advantage of pasture and water resource.
4. The inhabitants are hesitant to embrace experimental technologies offered by the outsiders. That is why they are often branded '**Unwilling to change.**"
5. Their cultural and traditional structures are pillars of decision making which represent entry points for interventions. Many efforts in the past by governments and donors have ignored such **traditional structures.**
6. Until recently, these areas have had a history of isolation and neglect from government services which accounts for their lack of foal education, and lack of exposure to commerce and trade.
7. Very few veterinarians have been trained among **pastoralists' tribes** of sub- Saharan Africa.

8. **Civil Conflict** has been increasing resulting in insecurity, **displacement** of people and their animals.

It is unfortunate that the Veterinarians and the Para-veterinarians that are trained in our in situations of learning- to day cannot work successfully in the delivery of animal health services under these unique circumstances.

- One obvious reason is that most of them come from o**utside the pastoralists**' areas and hey therefore lack the ethno-veterinary knowledge base essential to successful pastoralist animal health care delivery.
- The other reason is that the veterinarians are trained o provide services to sedentary herds using conventional approach. They cannot accommodate the dynamics of pastoralists' areas and lack the inherent flexibility required to work in such areas.
- Pharmaceutical importation has been liberalized and yet the veterinarian does not have any control over these drugs. He has therefore been easily out-competed by the illegal black market traders in pastoralists' areas.
    - ✓ These factors have contributed to the poor performance of veterinary service delivery in these unique areas, thus exacerbating the marginalization of pastoralists.
    - ✓ It is for this reason that it was found necessary to adopt the non- conventional approach of the CAHWs to deliver animal health services to the pastoralists' herds.
    - ✓ It should be noted that the development of the CAHW is a slow process with definite implementation steps.
    - ✓ The speed of program evolution is largely dictated by the community and based on discussions and the development of community consensus through true empowerment.

The phases and components in the development of such a program are as follow:

(1) A baseline (broad – based ethno- veterinary) survey using established PRA guidelines.

- Ethno- veterinary study identifying disease patterns, a name, descriptions.
- Production system survey identifying commonly accepted strategies and responses to various constraints.

- The development of prioritized constraints, resources and needs of the community.

(2) Development of consensus leading to a community – derived plan for the provision of sustainable pastoral animal health services.

- ✓ Community Dialogue with the target community for overworking the prioritized constraints that they identified during the survey.
- ✓ Development of a consensus of which needs can be addressed by the community.
- ✓ Development of a consensus on how the community will attempt to address animal health constraints. This is only done if the community determines I as a priority need.
- ✓ Development of a consensus on sustainability, cost, recovery, profits and fee for service animal health care.
- ✓ Identification of role of a CAHW and the skills and characteristics necessary for a CAHW to be successful
- ✓ Development of consensus on community and individual action to address other needs and constraints e. g marketing of livestock, cattle raiding and conflict resolution, community drought mitigation and coping strategies.

(3) The identification, raining and supervision of community – based animal health workers (CAHWs).

- ✓ The selection of candidates by the livestock owners for CAHW training
- ✓ Training and equipping of the CAHWs. (Community based Animal Health Workers)
- ✓ The supply f drugs and equipment kits
- ✓ Supervisory follow up and monitoring of the newly trained CAHWs.
- ✓ Post Training Community Dialogue Workshop (lessons learned, problem solving
- ✓ The Refresher Training after 4-6 months of follow –up.

Activity 6.3

1. What is CAHWS?
2. What are the unique characteristics of the pastoralists Areas Where CAHWs Operate?

Definition of a Community – Based Animal Health Worker (CAHW)

- In summary the CAHWs may be ‘ defined as a livestock owner or son/ daughter/wife of stockowner selected out of his/her willingness as well as appropriateness in the eyes of the stockowners to take care of the **health of the community livestock**
- He or she should have had a basic animal health training of at least two running weeks and have a basic veterinary kit.
- It should however be noted that the two weeks mentioned in this definition refers only the intensive phase of CAHW training.

This phase is followed by the Intensive **follow up or monitoring**

- And then the Refresher training
- This extended training on job takes one year.

What CAHWs are:

- CAHWs are community members with basic training in animal health, who treat animal disease with in their communities.
- Their selection, activities, education level, supervision and remuneration vary with circumstance but the following are typical:
  - ✓ CAHWs identify disease and provide prophylaxis and treatment.
  - ✓ Training is short (<3 months), inexpensive and often informal and local
  - ✓ There is veterinary support and supervision.
  - ✓ The community is fully involved in selection and activities of CAHWs.
  - ✓ The community pays for their services either directly or through a community – managed fund.

What CAHWs are not?

- In practice there is a broad spectrum of CAHW knowledge, skills, activities, remuneration and interaction with other stakeholders.

- However, especially for the purposes of regulation and legislation, it is useful to distinguish clearly between **CAHWs** and other **development agents a**nd providers of animal health services.
- L**ivestock owners trained in husbandr**y- (model farmers, master farmers, contact farmers, progressive farmers). These may be trained to give health care of their own animals but are not intended to provide treatment services for other farmers.
- **Development workers.** Salaried employees of government or private sector. Main role is provision of information, sanitation or inputs, rather than clinical services.
- **Veterinary professionals /** Para – professionals are often employed in animal health programmes, and may provide clinical services.
- **Extension workers.** Usually employed by government or private sector. Their role is to provide information and encourage improvements in farming system.
- **Traditional practitioners**- herbalists, with doctor. Use traditional methods (ethno – veterinary medicine, indigenous technical knowledge) and without recognized training or license.
- **Informal practitioners-** Quacks, injectionists, 'doctors'. Untrained and unlicensed providers of clinical animal health services who operate in the informal sector.
- **Medicine sellers-** traders who sell veterinary pharmaceuticals, without qualification of official recognition. They may sell from shops, market stalls or as in itinerant traders and may sell exclusively vet products or a mixture of vet drugs and groceries.
- **Pharmacists**- professional qualifications and officially recognized, but often little knowledge on veterinary pharmaceuticals.
- **Veterinarians**- degree in veterinary medicine, extensive training in veterinary pharmacy
- **Para**- professionals- certificate/ diploma or other tertiary level qualification in animal health.
- **Sub- para professionals**- 'on- the- job' or other- formally recognized training in animal health; many were former state veterinary service employees' scouts' or 'auxiliaries'. With retrenchment of government staff many have started to provide veterinary drugs and services.

What CAHWs do?

The activities of CAHWs should reflect the context in which they work

- **Accessibility-** where areas are very remote or insecure the CAHW may need more skills
- **Availability of veterinary services-** Where professional services are available CAHW should work under their supervision.
- **Activities of informal sector**- the knowledge and skills of CAHWS must be greater than those of informal providers.
- **Animal health problems**- different areas will have different types of problems. CAHWs skills need to be locally relevant.
- **Farming system**- Where farmers are very knowledgeable about animal diseases (eg. Pastoralists) CAHWs will need ore skills.
- **Policy**- CAHWs activities should comply with regulations and guidelines of the relevant authorities.

The CAHWs training manual has so far been prepared, continuously updated and made available for use with the objectives of:

- Creating uniformity in CAHWs training approach in the pastoral areas
- Serving as guiding tool and reference material for trainers.

6.6.2 CBPAHCS approach and procedures:

It is believed that CAHWs program complements the activities of public veterinary service and can enhance its overall effectiveness if it is properly perceived, designed and executed. There are no ready-made technical packages to extend but the following are important considerations in the implementation of CBPAHCS.

- **Need assessment/site selection:** The study is carried out using simple rapid appraisal tools in order to convince the facilitating project or private veterinarian of the importance of livestock and the perceived problems of the area. In order for livestock owners to share in any animal health activities they have to prioritize animal health as a problem. If other problems are more pressing then these problems cannot be disregarded. Key criteria when selecting target PAs could be absence of GOs and NGOs intervention, giving preference to those PAs with higher livestock and predominant pastoral/agro-pastoral

production system. In addition, assessment of indigenous knowledge and practice in animal health should be considered.

- **Participatory baseline survey.** Before initiating a community-based animal health program, surveys based on participatory approach should be conducted to assess the animal health situation in the specific area within the context of overall community-based animal health needs and to identify the causes of failures in disease control efforts in the past. The survey should enable to list the major diseases by species and then to describe the clinical and epidemiological picture for each disease in detail. Animal diseases should be ranked according to their importance and traditional knowledge regarding the cause and treatment of the most important diseases should be investigated. Such information would serve, as a basis for adapting the training to address local needs. The involvement of the local community in the initial design would be instrumental for the success of the program.

  In addition, the community leaders have a clear role in day-to-day supervision of the work. GO, NGO, or private veterinarian involved in CAHWs programme is approaching the community as a collaborator or facilitator rather than the owner of the programme. The traditional elders and beneficiaries (herders) in the community should actively share in the: Design, Execution, Supervision, and Evaluation.

  The participation is based on the simple idea that people are usually aware of the problems and constraints are affecting their lives and that they are well motivated to see these problems solved. By giving them a voice and a role in the process, both the appropriateness of the program as well as the quality of the implementation is enhanced.
- **Community dialogue.** Once the community fully understands and accepts the concept, then follows:
  - Selection criteria development
  - Defining roles and responsibilities of CAHWs, Veterinary Supervising Committee (VSC) and the target community at large (annexes 2 and 5)
  - Discussion and setting out convenient time for training (activities calendar).

- **Selection of CAHWs:** Once a community fully understands and accepts the concepts, the community should be facilitated to select a candidate for training according to the criteria that has been discussed. It should be stressed and clarified to the community that all services and drugs will only be available at fair market prices. The community should be clearly asked if they accept the program on the basis of free market prices at the village level.

  Over qualified CAHW candidates have higher personal goals. They may work fine for a few months, but they usually become bored with the simple CAHW tasks and drift away to town. Frequently one finds out later that their real reason for becoming a CAHW was the expectation of future opportunities or permanent employment.

  A serious of in-depth discussions with traditional elders should be conducted to determine what kind of person should be trained. Experiences elsewhere in community-based work has shown that the selection criteria are generally essential in a successful candidate selection. It should also be emphasized that CAHWs provide those services possible by their capacity while qualified staffs can handle other advance veterinary activities.

  Selection criteria for CAHWs trainees: This is central for the success or failure of any CBAHCP.

  - Willing to serve the community;
  - Bear responsible and respected member of the community;
  - a person who cares for animals;
  - Obedient;
  - Should demonstrate commitment to helping the community;
  - Be honest and free from any addiction for better financial management;
  - Should be established, married be healthy and able and willing to walk long distance;
  - Illiteracy should not prevent selection; otherwise ability to read and write is preferable. Literacy is an essential precondition to attend Module III;
  - Be well accepted by and integrated in the pastoral/agropastoral lifestyle;

- Be innovative, receptive pastoral/agropastoral member and knowledge of traditional animal health is an added bonus if available;
- Women candidates are encouraged not for their better financial management ability but just for the sake of it.

- **CAHWs training:** CAHWs trainings are participatory, extremely applied and repetitive. New concepts of etiology and treatments should incorporate and build upon the trainees existing perceptions and knowledge.

  The content of the training should vary according to the major diseases in the area. The local Veterinarian and Animal Health Assistants (AHAs) are likely to know the important diseases. The result of baseline survey should be consulted to help getting livestock keepers to articulate their major disease problems. As the content of the training program is based on the common disease problems of the area, diseases that are rarely seen should be avoided.

6.6.3 CAHWs training methodologies

A. Classroom sessions: It starts with cross checking of trainees' knowledge on the topic under discussion (questioning).Gradually give out your input as needed and link them to trainees' suggestions (informing). The time for question and clarification will be given for trainees thereby encourage trainees to summarize topic under discussion. Use simple and local language spoken by trainees to explain. Trainers should not need to give too much information at a time. Use visual aids, i.e. pictorial presentation if necessary. This part should not cover more than 30% of the whole training.

B. Demonstration -To see is to understand. This is usually done by trainers. It include what was covered in theoretical sessions. This part should cover about 10% of the training session.

C. Practical (clinical and field) exercise - To do is to remember. This is mainly to enable trainees to effectively practice what they have gained during theoretical training and demonstration. Trainees have to repeat the practices until they are able repeat themselves. This part should cover at least 60% of the training session

Trainees and training evaluation

This enables trainers to understand how much the trainees have acquired the desired knowledge and skills. This also helps to get feedback from the trainees on various issues.

Training Modules

The training is divided into two modules (corresponding to two phases) each conducted for duration 15-20 days, provided three to four months apart, during which CAHWs will be provided with vet kits and allowed to provide veterinary service for which they received training. This will avoid knowledge overburdening of trainees within a short period of time. It also gives enough time to monitor activities of CAHWs and decides their legibility for next phase training based on their performance.

Module one: basic husbandry practices and parasitic diseases. The training lasts for about 15-20 days based on the trainees' capacity and prevailing conditions.

At the end of the training CAHWs are provided with vet-kits (annex 11), which contain equipment, drugs (anthelmentics, acarcides and disinfectants (iodine solution)). CAHWs replenish drugs either from nearby government veterinary service or private drug shop. To be legible for Module two training a CAHW should demonstrate convincing fieldwork performance as witnessed by the supervising community and veterinary personnel and target community themselves (beneficaiaries). And also be able to do recording (basic literacy and enumeracy). A CAHW is preferably able to read and write in addition to his service performance. If the CAHW is illiterate, the facilitating agency should provide adult education before second phase training is organized.

Module two: experience sharing, feedback, vaccinatable, treatable/infectious, zoontic diseases, long acting antibiotics and trypanocidal drugs. Duration of the training is suggested to be for 15-20 days, including field practices on live animal, 3 to 4 months after the first module is addressed. Training contents include:

- Identification, prioritization and listing of those major infectious diseases, which are immunizable, treatable, and zoonotic diseases.
- Discussion on the experiences gained during their actual field activities, problems encountered, which the trainees want to be revised;
- In this phase trainees are enabled to differentiate, report and vaccinate animals under close supervision of veterinary personnel.
- Tentative diagnosis and treatment of major infectious diseases.

Follow-up and supervision

To be undertaken after each training phase. There are different ways of CAHWs supervision. The following are the most important ones.

- Evaluation in the filed using performance evaluation format;
- Consulting number of cases handled/vaccinated from pictorial format;
- Assessing the status of drug replenishment using drug replenishment monitoring format;
- Holding meeting with target communities, VSC or supervising veterinary personnel.

Expected services from CAHWs

CAHW's should practice in a limit to the allowed health care area. The service should not be doing like extensive surgery, experimental treatments and advanced health care service. CAHW's should be obedient to the local leaders and to the VSC or supervising veterinary personnel. The major expected service need to be handled by them is briefly summarized in chart below.

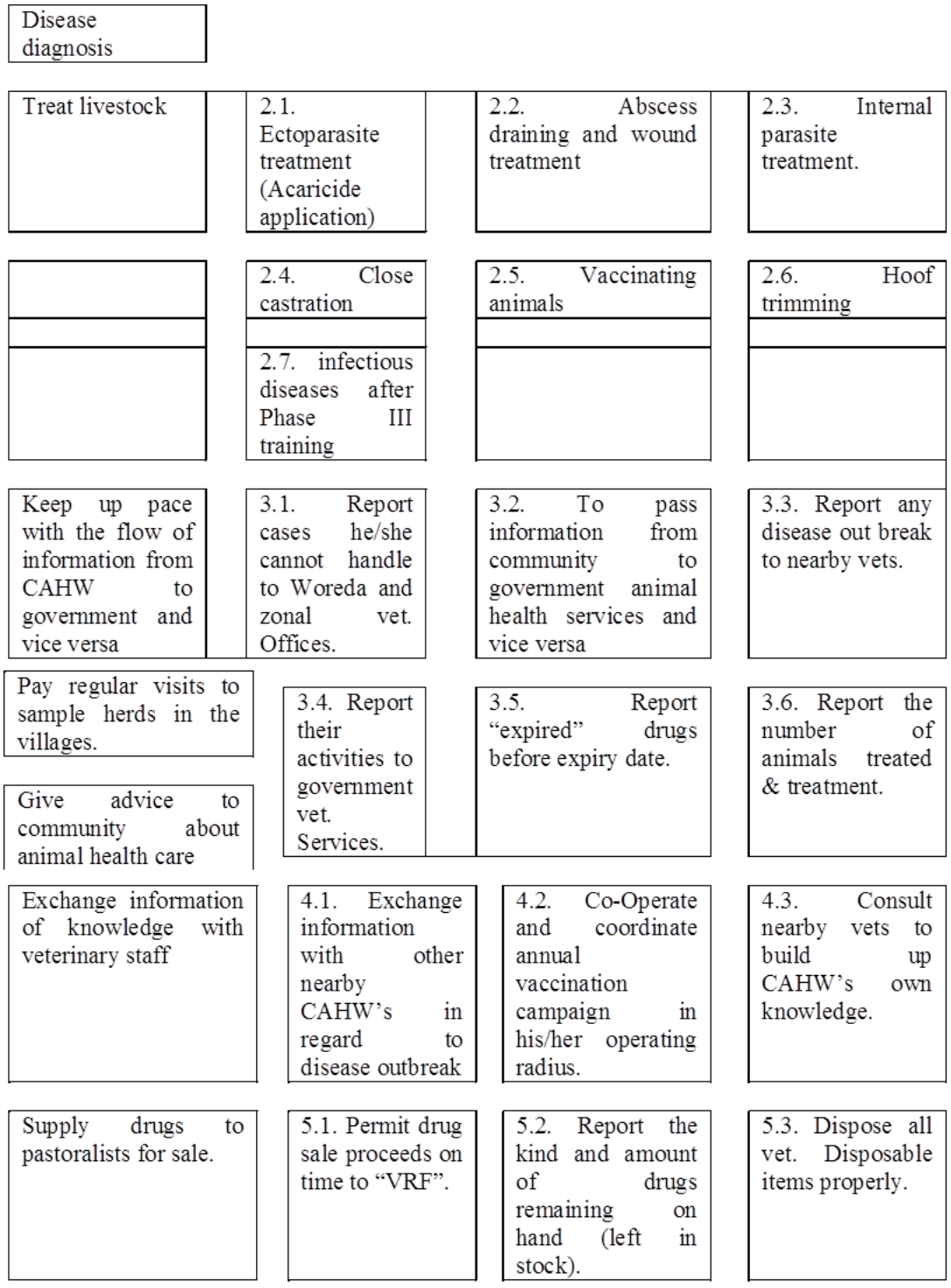

Figure 3. Expected services from CAHWs

Review Questions

1. What makes CAHWs as alternatives for community based health service extension compared to professional veterinarians?
2. What does it mean when we say CAHWs skills need to be locally relevant?
3. In what aspects of CAHWs program the traditional elders, the community and VSC should actively involve?
4. List out the CAHWS training methodologies and percent (%) of the training session to be cover
5. What are the unique characteristics of Pastoralist area where CAHW operate?

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