

Part I:

Animal Health Extension

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Course objectives

After going through this course, students should be able to:

- Understand the contribution of livestock to the household and national economy
- Identify livestock production systems and constraints challenging production and productivity
- Understand concepts and objectives of livestock extension education
- Discuss the basic philosophy and principles of extension education
- Recognize the need for animal health extension
- Identify the important elements that comprise the communication process.
- Analysis the various extension teaching methods and approaches and its application
- Understand and appreciate extension program development.
- Understand livestock technology adoption process
- Understand various PRA tools and techniques for diagnosing rural development challenges.

Lesson 1:
Description of the Ethiopian
Livestock Sector

Outline

1. Importance of Ethiopian livestock
2. National livestock population
3. Livestock production systems
4. Productivity of livestock
5. Values of livestock
6. Transport and carriage by equines
7. The contribution of the livestock to the wider economy
8. Constraints of livestock production

1. Importance of Ethiopian livestock

- The livestock sector plays an important role in the rural economy of Ethiopia.
- Livestock provide;
 - draught power for crop cultivation
 - milk, meat, eggs, wool, etc
 - ensure additional income to the livestock farmers.
 - the plant nutrients for large area of cropland
- The sub-sector holds 45% of the Gross Domestic Product (GDP) and 61% of the total export

Importance

- At the household level, livestock plays a critical economic and social role in the lives of;
 - pastoralists,
 - agro-pastoralists, and
 - smallholder farm households.
- Livestock provides an important function in coping with shocks, accumulating wealth & serving as a store of value in the absence of formal financial institutions (banks, insurances) and missing markets.
- In smallholder mixed farming systems, livestock provides;
 - nutritious food,
 - additional emergency & cash income,
 - transportation,
 - farm outputs and inputs, and
 - fuels for cooking food.

Importance

- About 80% of Ethiopian farmers use animal traction for cultivating their fields.
- In the case of pastoralists, livestock represents a sole means to support and sustain their livelihoods (as source of food & cash) .
- The importance of livestock in ***poverty alleviation*** has increased its emphasis on modernizing and commercializing the livestock sub-sector in recent years (SPS-LMM 2008).

2. National livestock population

- Ethiopia's livestock population is the largest in Africa.
 - Cattle – 59.49 million
 - Sheep – 30.7 million
 - Goats – 30.2 million
 - Equines – 11.01 million
 - Camels – 1.21 million
 - Poultry – 59.5 million
 - Bee colony- 6.19million (CSA, 2017)

3. Livestock production systems

- In Ethiopia, livestock is produced under two major production systems:
 1. *The sedentary mixed crop-livestock production system*
 2. *The nomadic pastoral or agro-pastoral production system.*
- The other less important, but growing, livestock production systems are
 3. *Small-scale peri-urban and urban production systems*
 4. *Medium- to large-scale commercial livestock production systems.*

Livestock production systems.....

- The mixed crop-livestock production system is based on;
 - limited communal/private grazing areas,
 - use of crop residue and stubble.
- Mixed-farm households practice both crop and livestock production
- The pastoral production system is based on extensive communal grazing while,
- Agro-pastoralists are characterized by a combination of both pastoral and mixed crop-livestock production.

4. Livestock productivity

- The current level of livestock productivity in Ethiopia is one of the lowest in the world.
- The carcass weights in Ethiopia are;
 - 108 kg/head for cattle,
 - 10 kg/head for sheep,
 - 8.5 kg/head for goats, and
 - 800 g/head for chickens,
- All of which are below the average productivity of all least developed countries.
 - Due to disease, poor nutrition, low productivity/low genetic potential

Productivity....

Table 2.3: Country level livestock productivity averages, 1999–2008.

Country	<u>Meat (carcass weight)</u>				<u>Eggs</u>	<u>Milk</u>
	Beef (kg/head)	Mutton (kg/head)	Goat (kg/head)	Chicken (g/head)	(g/year/hen)	(kg/year/cow)
Ethiopia	108	10	8	800	4355	210
Kenya	146	12	11	1204	4650	551
Malawi	205	14	12	800	4365	451
Rwanda	104	12	11	900	2974	494
Sudan	119	16	13	1000	5150	400
Tanzania	108	12	12	909	2600	174
Uganda	150	14	12	1300	3747	350
Eastern Africa	127	11	11	966	4232	321
Least Developed Countries	117	13	10	950	3209	318
World	205	16	12	1450	10028	2257

Source: FAO Statistical Database <http://faostat.fao.org>; FAO calculated data

Productivity....

Table 2.4. Total annual livestock production and livestock productivity in Ethiopia, 2000, 2004, and 2008.

	Production (meat, milk:1000 ton; eggs: million number)				Productivity ²			
	2000	2004	2008	Growth rate ¹ (%)	2000	2004	2008	Growth rate ¹ (%)
Meat	393	488	572	4.57%				
beef	294	336	380	2.90%	108	108	109	0.02%
mutton	36	60	82	12.30%	10	10	10	-0.02%
goat	26	44	65	13.31%	9	9	9	0.06%
chicken	38	47	46	0.11%	1	1	1	0.00%
Eggs	720	915	930	1.37%	4,329	4,360	4,360	0.04%
Milk	900	1,050	1,350	4.35%	207	210	211	0.61%

Source: FAO Statistical Database <http://faostat.fao.org>; Production: FAO estimates; Productivity: FAO calculated data

Notes: ¹Growth rate calculated over 2000–2008

² Productivity measures: meat (carcass weight): kg/head; eggs: g/head/year; milk: kg/head/year

Productivity....

- Milk yields in Ethiopia are also very low at 210kg/year/cow, a level less than half that of the Kenyan milk yield of 550kg/year/cow.
- Globally, only Tanzania has lower average milk productivity than Ethiopia at 174kg/year/cow (FAO Statistical Database).
- Ethiopia reached averaged levels of productivity in egg production.

Productivity....

Figure 5: Milk production and yields for Ethiopia, Kenya and Sudan

<i>Milk production and yields for Ethiopia, Kenya and Sudan</i>			
	Ethiopia	Kenya	Sudan
Feed supplied to livestock (kg of maize equivalent per animal)	28	40	94
Annual R&D investment in agriculture per hectare (USD)	7	27	8
Yield (litres/milking animal)/lactation	208	498	480
Annual growth rate of milk production from 1970–1999 (%)	2.36	3.60	4.79
Domestic consumption of milk (t)	893,699	2,212,323	2,753,129

Source: Compiled from Staal et al. (2008).

5. Value of livestock

Table 1: Estimated Gross Value of Ruminant Livestock Production 2008-09, billion EB

Product or service	MOFED ESTIMATE	REVISED ESTIMATE
Cattle offtake	6.302	8.103
Sheep offtake	1.643	2.254
Goat offtake	1.563	2.255
Camel offtake	0.145	0.145
Total estimated offtake	9.653	12.757
MOFED total offtake	9.653	
Cattle milk	8.483	10.899
Cattle milk for butter	4.533	5.824
Goat milk	1.352	6.436
Camel milk	1.978	3.346
Butter residue	3.125	4.015
Total estimated milk + products	19.471	30.520
MOFED total	19.634	
Sheep wool	0.003	0.005
Dung for fuel	1.966	3.429
Change in stocks	1.384	1.384
TOTAL RUMINANT PRODUCT OUTPUT	32.64	48.095
Percentage change		47%
Animal draught power	0	21.500
TOTAL RUMINANT PRODUCTION		69.595
Percentage change		113%

Source: IGAD LPI Working Paper No. 02-10

Livestock based financial services

Table 2: Shocks faced by rural households in Ethiopia

Events causing hardship	Percentage households seriously affected last 20 years
Harvest failure (drought, flooding, frost, etc.)	78
Policy shock (taxation, forced labour, ban on migration...)	42
Labour problems (illness or deaths)	40
Oxen problems (diseases or deaths)	39
Other livestock (diseases or deaths)	35
Land problems (villagisation or land reform)	17
Assets losses (fire, loss)	16
War	7
Crime/banditry (theft or violence)	3

Source Dercon 2001: 2

Catastrophic fluctuations in household income are an abiding threat to the welfare of rural families

- These shocks cause direct & indirect economic losses
- Severe shocks are direct cause of impoverishment

Livestock financial services.....

A. The value of livestock as credit

- Livestock as an opportunity cost of rural credit
 - Owners ability to 'cash in' on the value of their animals as needed

B. The value of livestock as insurance

1. Self insurance:

- livestock ownership functions as a kind of self-insurance
 - owners sell animals during emergency
- The capital value of Ethiopian herd in 2008/9 is **86 billion birr**

2. Risk pooling:

- Livestock loaning and gifting for assistance (pastoralists)

Livestock financial services.....

Table 3: Asset composition of households in 1994

Assets	Mean value in birr	Number of households	% sampled households
Livestock	2181	1154	78
Farm tools and implements	49	1307	89
Wooden and other furniture	112	1100	75
Cooking materials	140	345	23
Radio, tape, jewellery watch	66	305	21
Guns, spear, etc.	158	186	13
Cart	535	18	1.2
'Gotera' (grain storage basket)	391	6	0.4
Others	120	22	1.5
Sampled households		1477	
Holder of bank accounts		12	0.8

Source: Ayalew 2003: 28

Households protect themselves by saving during hard times

- Livestock is the major saving asset (bank) both for farmers & pastoralists

6. Transport and carriage by equines

Table 9: CSA 2009-10 national equine livestock population estimates adjusted to include pastoral animals in Afar and Somali Regions

		Donkeys	Horses	Mules
A	CSA National	5715129	1995306	365584
B	Afar (2 Zones)	36992	0	0
C	Somali R. (3 Zones)	118089	0	0
D = A - (B + C)	CSA national, 5 Zones removed	5560048	1995306	365584
E	Constant	1.0874	1.0006	1.0109
F = D + E	CSA national adjusted	6045996	1996503	369568
G	MOFED national	-	-	-

- Ethiopia is home to a lot of equines
- 2nd to China in donkey population
- Ethiopia contains over 40% of sub-Saharan Africa's horses and donkeys and over 90% of the subcontinent's mules.

Transport & carriage....

Table 10: National estimate of the value added by equines 2009-10

	Donkeys	Horses	Mules
National population, head	6,045,996	1,996,503	369568
Value added per head, EB	1810	2980	5590
Total value added, billion EB	10.943	5.950	2.066
National equine value added, billion EB	18.959		

- The national economic benefits derived from the use of equines (horses, donkeys and mules) – as providers of transport, traction and carriage.
- Pack and riding animals compete successfully with wheeled vehicles b/se of the country's rugged terrain & poor road network,

Summary: the value of livestock services to rural livelihoods

Table 11: Livelihood benefits derived from ruminant and equine livestock, 2008-09 in billion EB

Type of benefit	Agricultural GDP	Services not in current GDP estimates
Value added livestock products (meat, milk, etc) ⁵	MOFED: 32.232 re-estimated: 47.687 ⁶	
Traction power for ploughing		21.500
Benefit from financing		12.800
Benefit from self-insurance		8.600
Benefit from risk pooling/stock sharing		3.650
Transport and haulage by equines*		18.959*
Sub-totals	47.687	65.590
Total economic benefits		113.196

Notes: *refers to 2009-10

7. The contribution of livestock to the wider economy

- Ethiopians make use of livestock outputs for;
 - private consumption,
 - as exports, or
 - as inputs into other domestic industries.

1. *Private consumption:* consumption of livestock products constituted 7% of household expenditures.

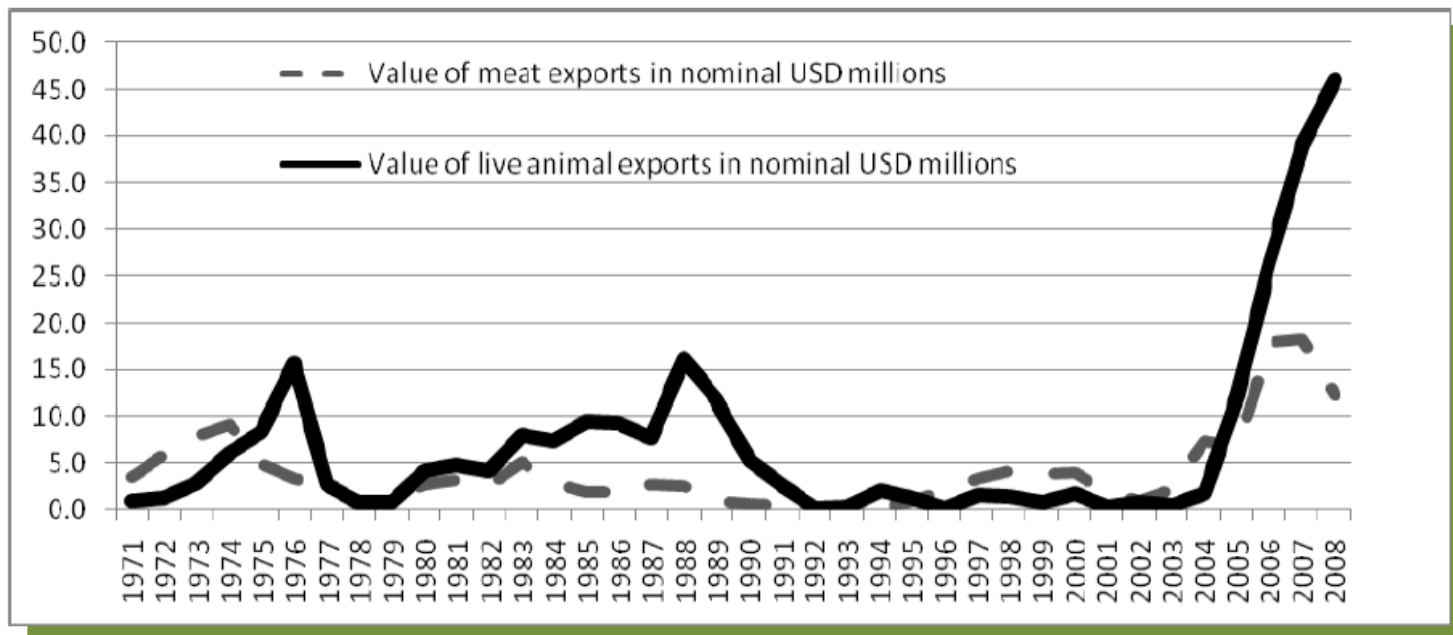
Table 13: Private final consumption of livestock products in 2008-09, billion EB

Expenditure	Value
Animal origin food and drink - home consumed	14.5
Animal origin food and drink - outside the home	1.4
Animal transport rent or hire	1.1
Animal transport self service	excluded
Dung sold for fuel*	2.0
Dung produced on farm and used for fuel**	excluded
Other (footwear, leather products, woollens)	unknown
TOTAL	19.0

Contribution to the economy....

- 2. Export trade in meat and live animals:** Official livestock exports constituted 11% of all of Eth's exports.
- Official + informal exports contribute about 20% of the present value of all exports.

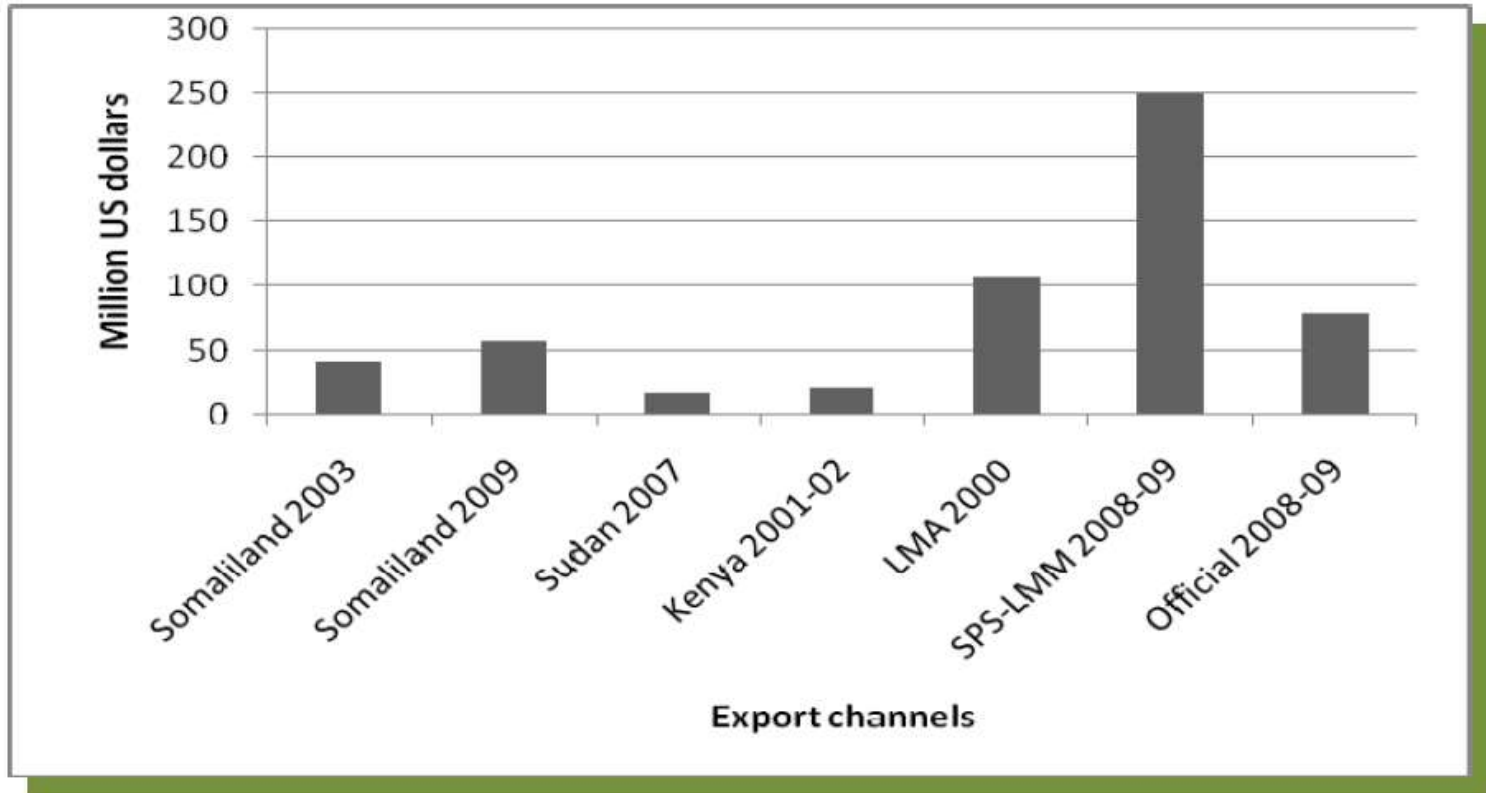
Figure 1: The value of official meat and live animal exports, million USD, 1971-2008



Source: Little et al. 2010, based Legese et al 2008, see Annex III.

Contribution to the economy....

Figure 2: The annual value of the livestock trade, official and unofficial channels



Unofficial cross-border livestock trade (Somalia, Sudan, Djibuti, Kenya routes) estimated about **125million** USD/Year

Contribution to economy....

3. Hides, skins and leather exports:

- Averaged yearly export value of 75.3 million USD in 2008/9 (5.2% of total export)

4. Livestock products as inputs into manufacturing:

- The manufacture of livestock products contributes about 5% of total manufacturing GDP.
 - About 70% of the livestock products consumed by producers.

8. Constraints

- The major constraints of livestock dev't in Ethiopia can be broadly categorized into;
 - ❖ **Technical:** nutrition, disease, genetic make up
 - ❖ **Organizational:** Authority, budget, dev't projects
 - ❖ **Institutional:** education, research, extension
 - ❖ **Infrastructural:** markets, vet clinics, product processing technologies
 - ❖ **Environmental:** drought, flood, etc.
 - ❖ **Policy aspects:** breeding, disease control, etc.

Lesson 2:
Extension Education;
Objectives and Principles

Outline

1. Concepts of extension education
2. Objectives of extension education
3. Principles and philosophy of extension education
4. Purposes and significance of livestock extension education
5. Extension educational process
6. Effective teaching-learning situation
7. Challenges of livestock extension
8. Target groups of livestock development
9. National goals and extension approaches

1. Concepts of extension education

- 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.

Concepts of extension...

Authors definition of extension;

- Extension involves the ***conscious use of communication of information*** to help people to form sound opinions and make good decisions (van den Ban and Hawkins, 1996).
- Extension is also defined as a professional ***communication intervention*** deployed by an institution to induce change in voluntary behaviour with a presumed public or collective activity (Roling, 1988).
- These definitions indicate that extension is for;
 - extending educational advantages
 - forming sound opinions to make good decisions
 - inducing changes in voluntary behavior.

Concepts of extension...

Extension education is;

- an on-going process of transferring useful information/technology to all farmers,
- assisting them to acquire the necessary *knowledge, skills* and *attitudes* to utilize the information/ technology effectively
- working with farmers to answer their needs for improved productivity and rural development
- “Learning by doing and seeing is believing”

Concepts of extension...

- **Extension education is concerned with three basic tasks:**
 1. The dissemination of useful and practical information
 2. Practical application of such knowledge to help farmers/rural people analyze their problems.
 3. Assisting farmers in using the technical knowledge gained to better solve their own problems.

2. Objectives of extension education

- To teach people living in rural areas *how to raise their standard of living* by their own efforts;
 - using their resources (land, livestock, water) and manpower
 - with the minimum assistance from the Government .

Objectives...

Specific objectives include;

1. to develop the people,
2. to disseminate the useful & practical information relating to livestock, including improved cultural practices, dairying, poultry, nutrition and other aspects,
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 world in which they live,
5. to promote better social, natural, recreational, intellectual and spiritual life among the people, and
6. 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.

Objectives...

- The ultimate objective of livestock extension education is;
 - development of livestock farmers by improving their living standards.
- This could be done by;
 - Bringing about a desirable changes in the **knowledge, attitude** and **skill**.
 - Assisting livestock farmers to realize their needs and problems.
 - Developing rural leadership, mobilizing people and their resources.
 - Providing knowledge about recent technologies and their application.

Objectives...

- Three main sides of extension education;
 1. As a discipline, it deals with the ***behavior of people***
 2. As a process, it seeks to ***influence the behavior*** of rural people
 3. As a service, it makes the government ministry or voluntary agency ***as useful as possible*** to the people who support it.

3. Principles and philosophy of extension education


- Principles are the specific *guidelines* or the base for any decision making process or initiating an action.
- The widely accepted principles of extension education are principles of;
 1. interest and needs
 2. grass-roots level organization
 3. cultural difference
 4. cultural change

Principles.....

5. cooperation and participation
6. applied science and democratic approach
7. learning by doing
8. trained specialists
9. adaptability in the use of extension teaching methods
10. local leadership
11. whole family approach
12. satisfaction of client group needs

Principles...

Philosophy of extension involves;

- changing *attitudes, knowledge* and *skills* of the people.
- working with men and women, young people, boys and girls to answer their needs.
- helping people to help themselves
- principles of “*Learning by doing*” and “*Seeing is believing*”
- development of individuals, their leaders, their society and their world as a whole.
- working in harmony with the culture of the people.
- a two way channel; researcher/extension  farmer
- a continuous educational process.

Principles....

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

Methods of Approach

- Extension educational systems/approaches can be grouped under four main headings:
 1. the extension approach,
 2. the training approach,
 3. the cooperative self help approach, and
 4. the integrated development approach.

4. Purpose and significance of livestock extension education

- Livestock extension involves **systematic** and **organized communication** with livestock owners to help them
- The livestock owners obtain a better insight into their present and future position as livestock owners;
 - acquire sufficient knowledge and skills necessary to increase production or reduce cost of production;
 - develop positive attitudes of livestock development
 - able to choose feasible and optimum objectives;
 - able to identify problems, look for solutions, solve the problems identified; and
 - evaluate the results within the farming system situation in which they are operating.

Purposes of extension....

AIM of EXTENSION

RAISE STANDARD OF LIVING
of livestock owners



INCREASE PRODUCTION OF ANIMALS
THEREBY INCOME THROUGH
APPLICATION OF SCIENTIFIC
KNOWLEDGE



MEANS

EDUCATION OF LIVESTOCK OWNERS
AND OTHER STAKEHOLDERS



RESOURCES

LIVESTOCK OWNERS' RESOURCES
(labour, livestock, land, capital etc.)
WITH MINIMUM GOVT. ASSISTANCE

Purposes of extension....

The area of knowledge covered by Livestock Extension are;

1. *Technical problems* such as;

- livestock diseases/health,
- improved breeding,
- better feeding, housing and management

2. *Farm economics* and *organizational problems* which include;

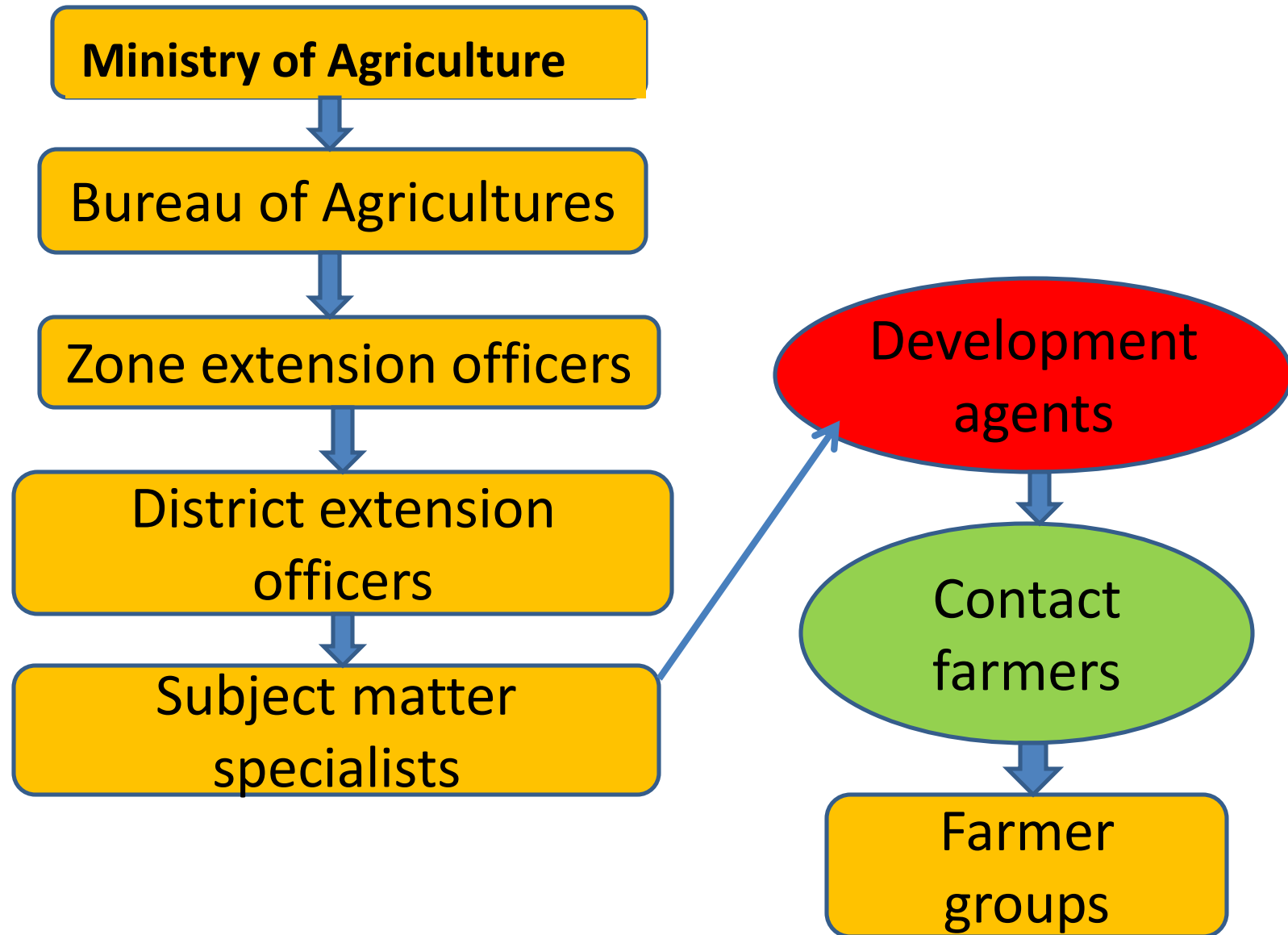
- importance of prevention of diseases,
- culling of animals,
- labour management,
- labour saving equipments (milking machines, milk/meat processing equipments),
- how to reduce cost of production of milk, meat or eggs, etc.

3. Issues pertaining to *disease prevention and control* regulations

5. Extension educational process

- Extension education is a **process** and it is **participatory** in its approach.
- The sequence of steps involved in the *process* are;
 1. Situation analysis
 2. Formulation of objectives
 3. Deciding the content and teaching methods
 4. Outcome evaluation and impact analysis and
 5. 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**.

Extension education structure



6. 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*.

Effective teaching....

The teaching learning process follows six steps:

- 1. Attention:** Bringing attention of the learner is the first step in the teaching learning process.
- 2. Interest:** the trainer is to arouse the interest in the learner towards the subject matter.
- 3. Desire:** the trainer has to sustain the interest and stimulate the learner to convert the interest into desire.
- 4. Conviction:** confidence and satisfaction of the learners is achieved.

Effective teaching....

6. Action: the conviction is converted into action and the job of the trainer is to make his learners act in the *lines of the knowledge acquired*.

7. 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 behavior.

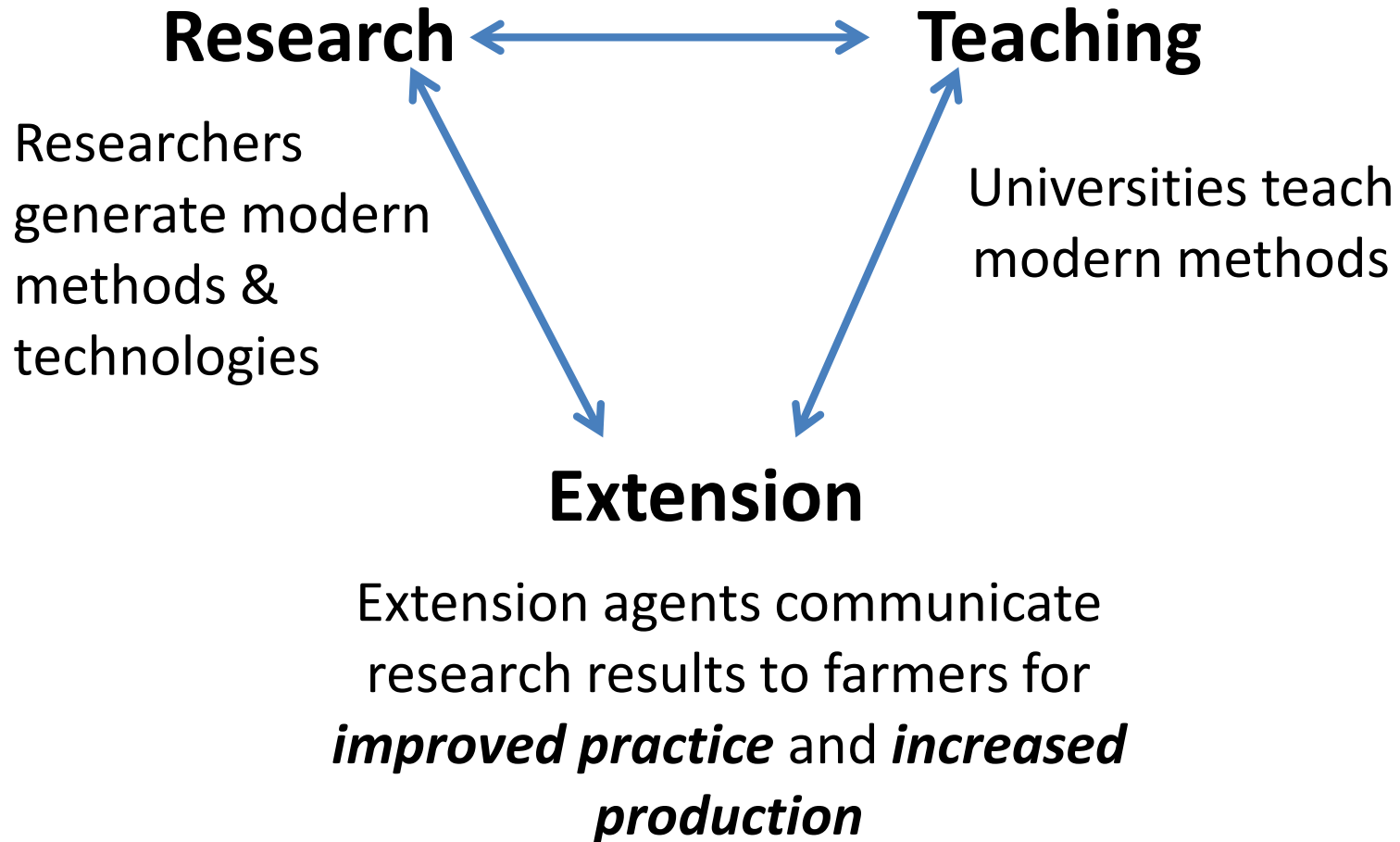
7. Importance of livestock extension and challenges

1. In Ethiopia, over 85% of the population depend on livestock whether directly or indirectly
2. Livestock owners spread throughout the country
3. Resource poor livestock farmers contribute a lot to **production of milk, meat, egg, wool, etc.,**
4. Common property **lands** are shrinking leading to increased dependency on purchased inputs

Challenges

5. Majority of livestock keepers are poor and women
6. Veterinarian is the most credible source of information on livestock rearing & health
7. The market for livestock and livestock products is mostly unorganized
8. Majority of the poor own few and less productive animals
9. The livestock owners have no control on ***quantity*** and ***quality of production***.

Linkages in Extension



8. Target groups of livestock development

Livestock development *target groups* with whom the extension agents need to work with include;

- 1. Livestock owners:** all those who own livestock (dairy farmers, sheep and goat keepers, swine & poultry farmers, etc.)
- 2. Livestock service providers:** animal husbandry personnel, breeders, marketing institutions, training institutions, cooperatives, NGOs, Research/ Academic institutions, Insurance agencies etc.
- 3. Input suppliers:** Semen banks, feed mixing plants, Pharmaceuticals, vaccine production units, livestock product processing units, agro related industries etc.
- 4. Policy makers:** Ministry of Agriculture/BOA, Animal health & husbandry departments, researchers, etc.

9. National Goals and Different Extension Approaches

- The extension programs must address the national goals.
- The important agricultural development **goals** at national level are;
 1. National food security
 2. Improving rural livelihood to reduce poverty and food insecurity and,
 3. The sustainable use of natural resources within the country.

National goals & extension objectives...

To accomplish the goals, the extension system needs to be focused on four objectives:

- 1. Technology transfer**, especially for improving the production of food grains, milk, meat, eggs, fish etc.
- 2. Human capital development**, especially the skills that poorly educated farm households need to increase farm income,
- 3. Building social capital development** or getting farmers organized into producer groups or other types of farm organizations to carry out specific activities and
- 4. Educating farmers** to utilize sustainable natural resource management practices.

Different Extension Approaches

Some of the approaches which focus on farmer participation;

1. **Livelihood approach:** considers the animal production types (eg. dairy, poultry, sheep production, etc...) that the livelihood of livestock owners depend.
2. **Group approach:** the development of sustainable farming practices often requires collective decision-making
3. **Market driven approach:** the adoption of technologies is market driven rather than technology driven.
4. **Entrepreneurial development approach:** encouraging farmers who have got *entrepreneurial abilities* to enter into new ventures of livestock development.
5. **Participatory approaches:** farmers are considered as partners in *development* rather than as end users of technology

Lesson 3:
**Extension Teaching Methods &
Alternative Approaches**

Outline

1. Extension communication
2. Extension teaching methods
3. Technology adoption and consequences
4. Screening of technologies and management practices
5. Technology Application: assessment and refinement, demonstration & training

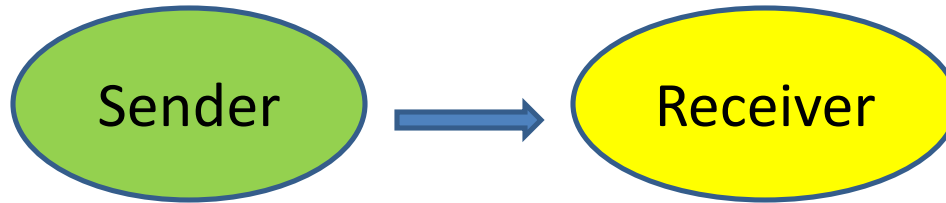
1. Extension communication

- 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.

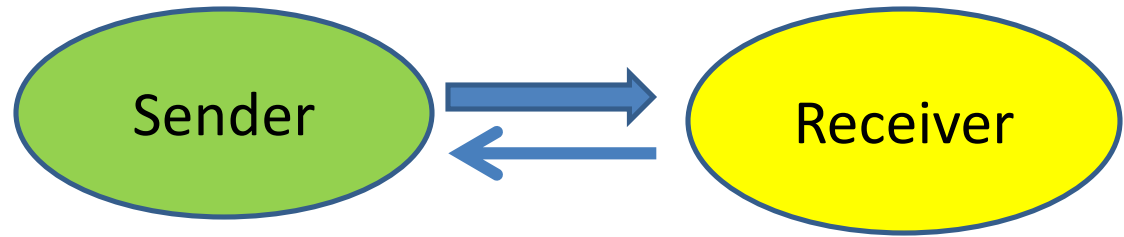
Communication...

- Through communication, an individual shares his idea, information and knowledge with others.
- A good communication is the one which conveys the receiver what exactly the communicator wants to convey.
- A good communication depends upon the communicator's ability to organize the message with proper treatment in suitable channel keeping in view the ***receiver's type, cognitive ability and experience.***

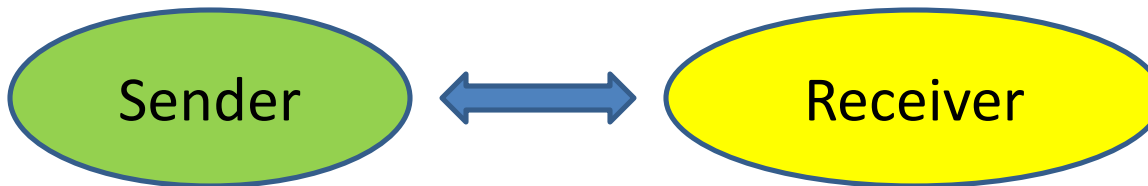
Communication...



One-way communication
Action interaction



One-way communication
with feedback



Two-way communication
Transaction

Elements of communication

The six key elements of communication are:

1. **Communicator:** is the person from whom the message originates (eg. extension agent, veterinarian)
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:** is the end result of the communication. It is the change that has taken place with the receiver due to the communication.

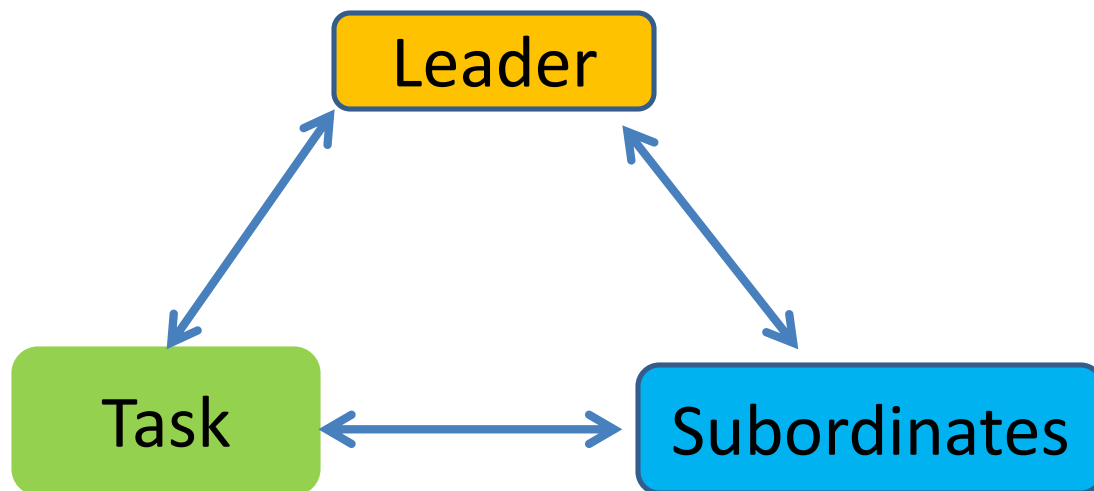
Barriers to effective communication

Some of the common problems in the way of effective communication:

1. Lack of planning
 2. Unqualified assumptions of the sender
 3. Badly expressed message
 4. Loss by transmission
 5. Poor listening and premature evaluation
 6. Fear, distrust and threat
 7. Insufficient adjustment period to change
 8. Biasness of the communicator.
- The extension agent/veterinarian being the sender of communication must be aware of these barriers.

Communication effectiveness triad

- Effective communication is a triad consisting of the **leader**, the **members** of the work group and the **task** which the work is to be performed.
- The leader exists as long as there are followers (subordinates) and a task to be performed.
- The followers will look forward to the leader for direction and goal satisfaction.



2. Extension Teaching Methods

Extension Teaching Methods

According to Use

Individual contact methods

Group contact methods

Mass contact methods

According to Form

Written

Spoken

Visual

Audio Visual

Extension teaching methods...

Individual Contact Methods

- Farm and home visits
- Office calls
- Telephone calls
- Personal letters
- Result demonstrations
- Informal contexts

Extension teaching methods...

- Group Contact Methods**
- Tours/field trip
- Method demonstration
- Schools
- Result demonstration meetings
- Brain storming
- Field Day
- Leader training meetings
- Role playing
- Lecture meetings
- Panel discussion
- Conferences/workshop

Extension teaching methods...

Mass Contact Methods

- Printed materials
- Radio
- Television
- Posters
- Campaigns
- Exhibitions
- Motion pictures
- Public address system (PAS)

Extension teaching methods...

Written

- News paper
- Circular letters
- Leaflets
- Folders
- Pamphlets
- Bulletins
- Newsletters

Spoken

- Farm and home visits
- Hospital/ office calls
- Telephone calls
- Meetings
- Radio
- Tape recordings

Extension teaching methods...

Visual

- Exhibitions
- Flip books
- Posters
- Charts
- Slides
- Photographs
- Black board
- Result demonstration
- Slide projectors
- overhead projector

Audio-visual

- Method demonstration
- Result Demonstration,

- Television,
- Motion pictures,
- Campaign,
- Multimedia projector,
- Shows, drama/songs

Projected aids

- Movie films,
- Film-strips,
- Slides,
- Over-Head Projector Opaque
- Projector material,
- Material and LCD projector.

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

Teaching aids currently in use

- Digital cut outs, banners, collapse banners
- Multimedia projector
- White marker board
- Direct projector
- Digital camera
- TV
- CD player
- Mobile phone
- E-mail
- Three dimensional pictures
- Audio-video conferencing

3. Technology Adoption and Consequences

- The adoption of recommended technologies depends upon the perceived technological characteristics
 1. Relative advantage of the transferred technology over the existing practices,
 2. The suitability or compatibility of the technology to their system,
 3. The degree of technological complexity in integrating it in their existing system,
 4. The possibility of testing the technology on trial basis in a limited way before the large scale adoption and
 5. Observability of the relative benefits over the adoption of the technology in their system.

Eg. 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.

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
6.	Compatibility	Culling of cattle especially cows through slaughter is not compatible with the social system.

Consequences of technologies or practices

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.

Differences between transfer of technology and participatory extension

PARTICULARS	TRANSFER OF TECHNOLOGY	PARTICIPATORY EXTENSION
Main objective	transfer of technology	empower farmer
Analysis of needs & priorities	by outsiders	Farmers facilitated by outsiders
Transferred by outsiders to farmers	“commandments” messages package of practices	Principles methods basket of choices
The „menu’	fixed	according to choice
Farmers behaviour	hear messages and act on Commandments adopt, adapt or reject the packages	use methods apply principles choose from basket & experiment
Outsiders’ desired outcomes emphasis	widespread adoption of package	wider choices for farmers, farmers’ enhanced adaptability
Main mode of interaction	Extension worker to farmer	farmer to farmer
Roles of extension agent	teacher & trainer	facilitator searcher for and provider of choice

Source: Chambers (1993)

Cont'd...

One of the goals of extension is to

- ***transfer technology*** and in the process the extension agent is involved in education of farmers as well as arranging for the technical inputs and services, and
- hence, extension and transfer of technology are consider as ***one*** and ***the same***.

4. Screening of Technologies and Management Practices

- Screening means matching the available technologies with the needs of the livestock farmers.
- Screening helps in **choosing appropriate technologies** thereby reducing the efforts and costs in transferring the technologies which are otherwise not suitable to the livestock farmers or do not address their needs.

Screening of technologies....

- Available animal technologies and management methods in livestock production can be screened by criteria such as:
 - **adaptability of the technology** in the socio-economic situation where the target farmers are operating;
 - **availability of technical inputs & services** such as medicines, feeds and markets;
 - **economic viability of the technology** within acceptable risk levels;
 - **acceptability of technology** according to cultural norms and values.

Eg. Screening of technology

Characteristics	Selective Breeding of indigenous cows	Cross breeding of local cows
Profitability	Low	Very high*
Observability of results	Very slow	Slow
Simplicity	Simple	Not so simple**
Cultural Compatibility	High	Low
Disposal of unproductive animals through slaughter	Difficult	Difficult
Extent of risk	None	High
Management	Survive on poor quality feeds and fodders	Requires good quality feeds and fodders

Table: Screening of breeding technology based on the perceptions of cattle owners

5. Technology Application: Assessment and Refinement, Demonstration & Training

- 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.

Cont'd...

Some of the reasons for low acceptance of technologies:

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

Cont'd...

- Hence, the assessment and refinement of technology for better acceptance need to be :
 - site specific
 - holistic
 - farmer participatory
 - technical solutions to existing problems
 - inter-disciplinary
 - interactive and
 - gender sensitive

Lesson 4:

Participatory Rural Appraisal (PRA)

Outline

- Introduction
- PRA principles and features
- Comparison of PRA & RRA
- Pillars of PRA
- Scope of PRA
- PRA techniques and methods
- Participatory technology development

1. Introduction

PRA is a set of **participatory** and largely **visual techniques** for assessing;

- group and community resources,
- identifying and prioritizing problems and
- appraising strategies for solving the problems.
- It is a research/planning methodology in which a local community with assistance of outsiders studies an issue;
 - that concerns the population,
 - prioritizes problems,
 - evaluates options for solving the problem(s) and
 - comes up with a Community Action Plan to address the concerns that have been raised.

2. PRA principles and features

- **Respecting** people's knowledge & learning from them.
- **Participatory:** relies heavily on participation by the communities
- **Optimal ignorance:** intend to gather enough information you need.
- **Flexibility:** PRA does not stick to fixed plan to action.
- **Visualization:** All data collected from the people are visualized by them
- **Triangulation:** use of different sources of information to cross-check answers.
- **Team work:** It involves a team of people working with a community for several days.
- **Analysis** is done in the field

Cont'd....

- PRA encourages **group participation & discussion**
- The information to be processed is collected by group members themselves.
- It is presented in highly **visual form**, usually out in the open and on the ground, using pictures, symbols and locally available materials.
- Once displayed, the information is “**transparent rather than hidden**” - all members can comment on it, revise it & criticize it. This assists in cross-checking and verifying collected data.

3. Comparison of PRA & Rapid Rural Appraisal(RRA)

- **Both** are systems of collecting & analyzing information about rural life in order to improve decisions.
- **Both** consist of an approach & a set of techniques. The approaches are different; the techniques are almost the same.
- **PRA** empowers *the local community* to analyze its situation and to improve its decisions. Outsiders facilitate
- **RRA** helps *the researcher* to have a better, more sympathetic understanding of rural life, thus improving his/her decisions.

4. Three pillars of PRA

1. ***Unlearn yourself:*** learn to give up what you know when you come to learn. From the people listen carefully.
2. ***Use your own best judgment at all times:*** Be critical of what do learn.
3. ***Do it yourself:*** PRA is a method, which every one should try on one has to facilitate PRA process in the field and comment on the approach.

5. Scope of PRA

PRA tools & techniques could be used;

- at all levels of project formulation & implementation.
- by all communities, all experts, people at all levels and living conditions.
- to identify, formulate, implement, monitor & evaluate projects

1. The important step in PRA process is “*handing over the stick*” to the people.

- The people analyze their own situation, plan actions and implement.
- Outsiders have roles as conveners and facilitators.

2. In PRA; data is collected & analyzed using a “**basket of tools**” which help to observe facts on the diagrams lead to best estimates; indicate peoples preferences and priorities etc.

6. PRA techniques and methods

PRA techniques are used in the field to gather qualitative data, often to complement quantitative data

The most common PRA methods:

1. Diagramming, Mapping and Modeling:

- transects
- maps (resource, social, farm)
- venn diagrams
- seasonally analysis
- historical analysis (time lines, trend lines, activity profiles)

2. Ranking & scoring

- pair wise ranking
- matrix ranking
- matrix scoring
- well-being analysis & wealth ranking
- proportional piling
- pie charts

3. Problem analysis

- identification and specification
- causal chaining
- Prioritization



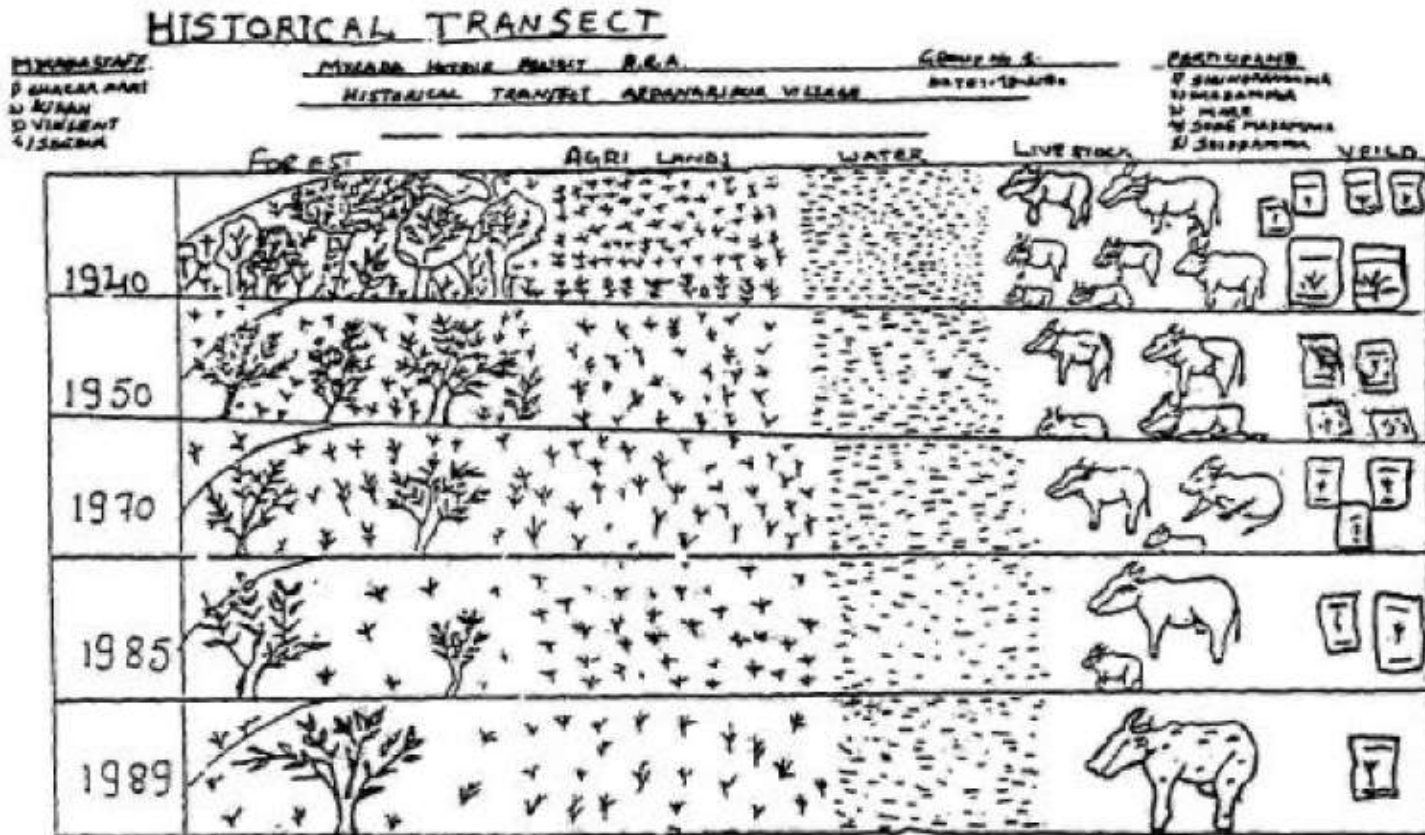
PRA techniques & methods...

- **Time related analysis** - key events in the history of the community , problems, and achievements.
- **Seasonal calendar** - patterns of activities and occurrences within a community
- **Ranking & scoring** - compare things according to different qualities people value & placing in an order of what is more or what is less important.
- **Semi-structured interviews** – for identification of problems and analysis

Transects: observatory walks

Transects – show a cross sectional map of the area to show topography, vegetation, other natural resources , farming practices

Figure 8. Historical transect for animals, trees, water and crops. Drawn by villages of Ardanarypura village



Matrix scoring

Matrix scoring is a two dimensional comparison by listing the elements down on one side, and the criteria on the other side

	Egg Plant	Lettuce	Tomatoes	Sorrel	Barambi Green	Nana	Bitter Tomato	Karen Kareng	Cassava	Okra	Onions	Cabbage	Hot Pepper	Mango	Sweet Pepper
More durable in terms of storage	2	1	2	1	2	2	4	1	4	10	10	4	10	2	4
More cash yielding	4	4	4	4	4	4	4	5	10	10	10	10	10	10	10
More blood giving	4	4	2		4				4		2				
More energy giving	4	4	3	1	4	4	4	3	4	4	4	4	3	3	
Consumed mast	4	4	2		4		2	1	4	2	2	4		4	
More marketable	4	4	4	4	4	3	4	4	4	4	4	4	4	4	3
Less water requirement			4		4				4		4	4	4		

Figure 1: Matrix scoring technique (Source: ActionAid, 1992)

Wealth ranking

It 's establishing economic order of members of a community.


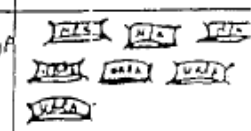


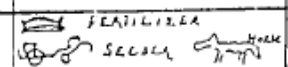
GRADE	CRITERIA	Compound No.	CASTE DISTRIB	AATG INPUT ASST.
RICHEST	ELECTRIC FACILITIES (CONCRETE), PRIVATE CAR, B-2 MOTORBIKES, A HERD OF CATTLE, HIGH LABOUR FORCE, ENOUGH FARM IMPLEMENTS, INTERNAL & EXTERNAL ASSISTANCE, BETTER HOUSING FACILITIES, A LOT OF LIVESTOCK, INFLUENTIAL.	32		
RICHER	HERD OF CATTLE, LABOUR FORCE, FARM IMPLEMENTS, GOOD HOUSING FACILITIES, EXTERNAL ASSISTANCE, POPULARITY.	① 2, 3, 4, 5, 6, ⑧, 12, 20, 26, 27, ③③, 35, ④④	GRIOTS - 2 COMP B/SMITHS - 1 " COBBLAR - 1 "	
POORER	AVERAGE HOUSING FACILITIES, LESS FARMING IMPLEMENTS, LESS LABOUR FORCE, SKILLS,	③, 10, 13, ④, 15, ⑧, 24, ②⑤, ②⑥, ③①, 31, 34, 36, 40	B/SMITH - 2 COMP. COBBLAR - 2 " SLAVE - 1 "	
EVEN POORER	POOR HOUSING FACILITIES, HIGH DEPENDENCY RATIO, VERY LITTLE IMPLEMENTS, LOW LABOUR SUPPLY THROUGH (A.S. STORAGE)	⑨, 11, 16, 17, 19, 21, 23, 28, ③⑧, ④①, 41, 44, 45, 46	COBBLAR - 1 COMP. GRIOT - 1 " B/SMITH - 1 "	
POOREST	VERY POOR HOUSING, HIGH DEPENDENCY RATIO, LOW LABOUR SUPPLY, FOOD STORAGE, NO FARM IMPLEMENTS, LARGE FAMILY SIZE, NO SOURCE OF SUPPORT	①②, ③⑦, 45, 47	SLAVE - 1 COMP. COBBLAR - 1 "	
		8 GRIOTS COMP B/SMITHS	① SLAVES COMP. ② COBBLARS	

Figure 2: Wealth ranking exercise (Source: Guijit, 1992)

Farm sketch map

Farm sketch map – used to show land use plan of the community

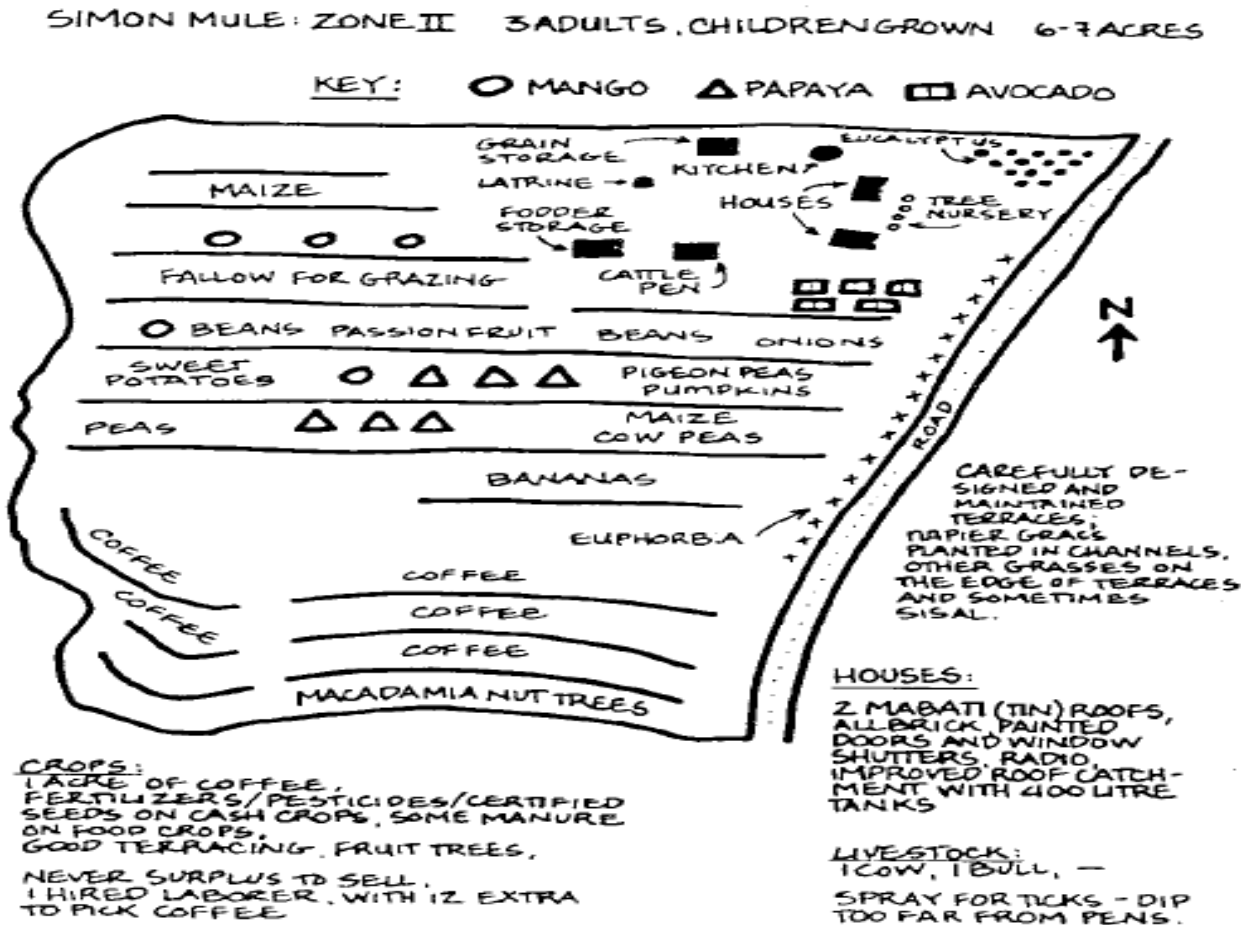


Figure 3: Participatory map, Farm Sketch from Kyevaluki (Source: NES, 1990)

Venn diagram

Venn diagram is used to show key institutions/ organizations & their interaction with the local community.

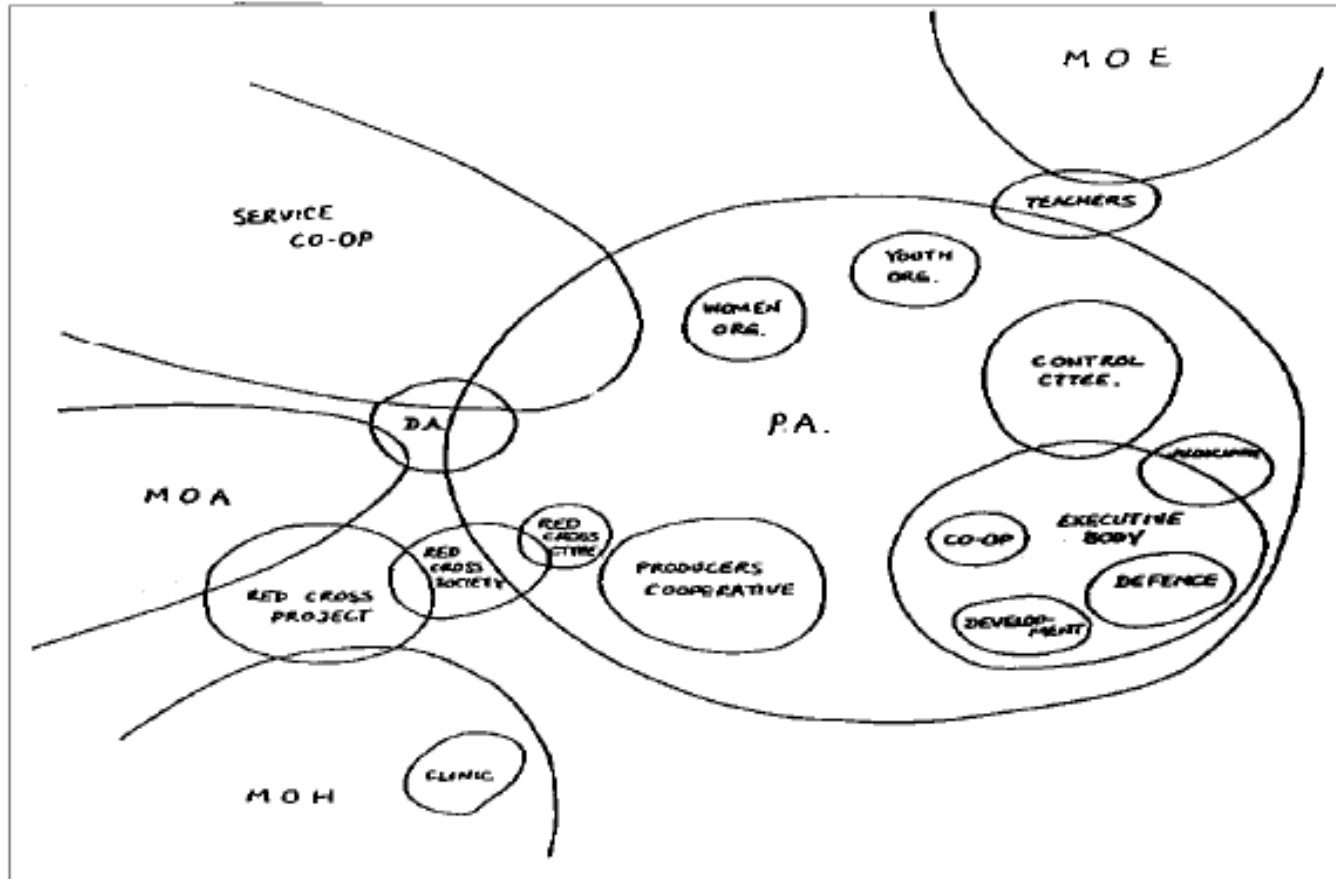


Figure 4: Venn diagram of decision makers in a Peasant Association in Wollo, Ethiopia (Source: Ethiopian Red Cross Society, 1988)

Problem analysis

- For identification and prioritization of problems

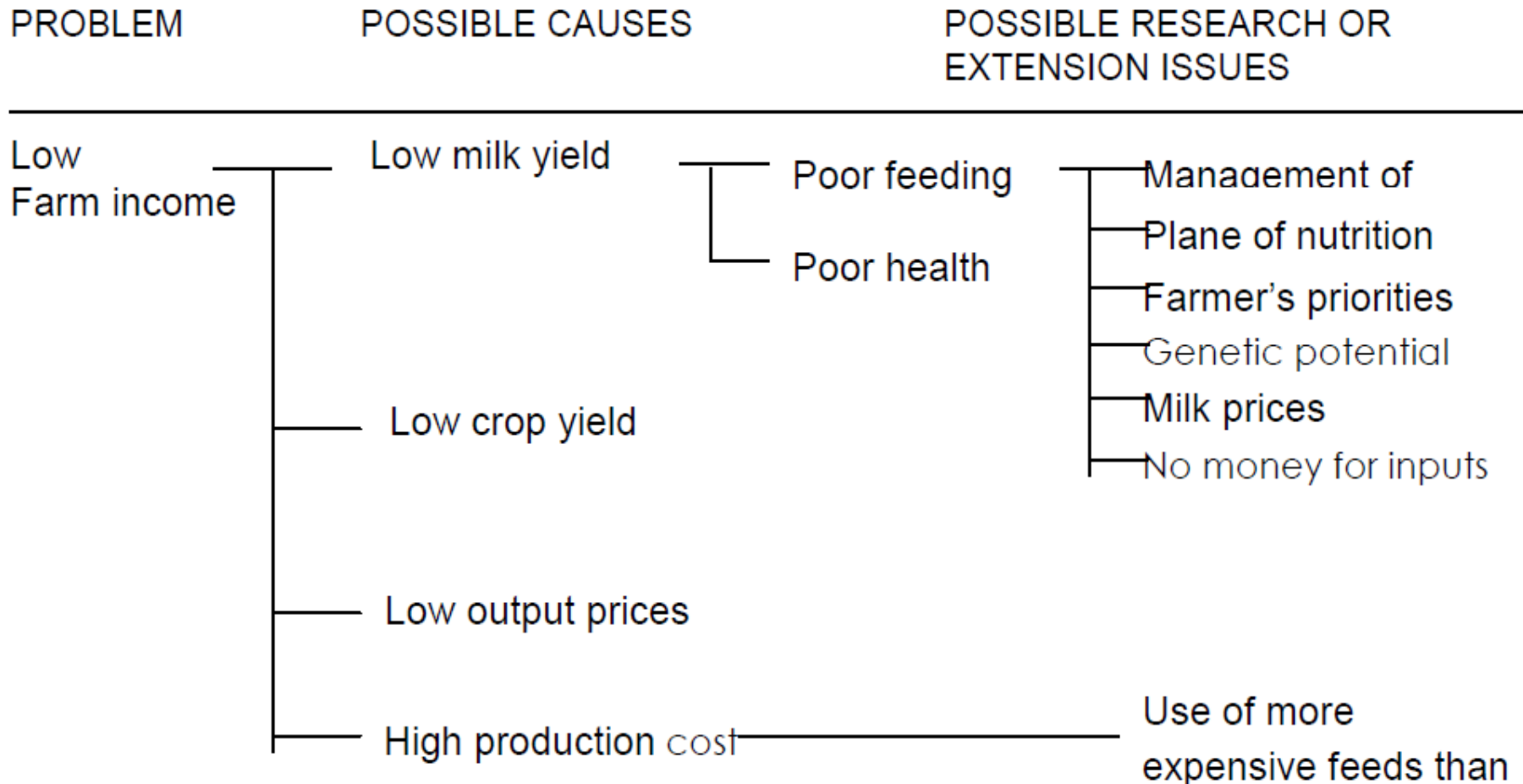


Fig 7. An example of problem tree

7. Participatory Technology Development (PTD)

- PTD is an approach, which involves encouraging farmers, other stakeholders to engage in experiments in their own fields
- So they can learn, adopt new technologies and spread them to other farmers.

PTD is a process in which:

1. problems for which solutions have been sought are identified and prioritized by farmers
 2. alternative solutions to be tested are defined by farmers
 3. design of experiment is decided by farmers
 4. the implementation is done by farmers
 5. monitoring is decided and executed by farmers and
 6. evaluation is done by farmers.
- PTD is now accepted as a research approach to agriculture, livestock and natural resource management

PTD...

- **The objectives of PTD approach in livestock research are to:**
 1. empower clients to develop and use livestock technologies
 2. develop appropriate livestock technologies suited to the farm holdings
 3. empower stakeholders, especially the marginalized ones, on their own decision making so that their capacity to make effective demands on research and extension organizations is strengthened
 4. improve the functional efficiency of formal research

Benefits of PTD

The benefits to the livestock farmers include:

1. Encouragement of farmer experimentation/demonstration
2. Indigenous knowledge of farmers can be gainfully tapped
3. Harnessing of farmers' knowledge and creativity are harnessed to develop appropriate technology
4. Farmers are motivated when their views are respected
5. Technologies are more rigorously tested under users' conditions.
6. Technologies to suite diverse agro-ecological & socio-economic situations
7. Technologies are more likely to be adopted
8. Technologies are in users hands more rapidly and
9. Complements station-based research

Lesson 5:

Classic extension approach

Outline

- Introduction
- Demonstrations
 - Method demonstration
 - Result demonstration
- Field demonstration
- Training
- Training approaches

1. Introduction

- Demonstrations are very widely used extension teaching methods in demonstrating the **skill** or **method** or the **result** of a particular practice to the farmers.
- Demonstrations if organized properly will arouse interest and improve the learning process.
- The demonstration is the most effective way to;
 - show how things work,
 - show how to do the work, principles involved in an operation and
 - show the end results of the method adopted.

2. Demonstration

- Demonstration is classified into;
 1. method demonstration and
 2. result demonstration
- 1. Method demonstration:**
 - is conducted to explain how to carry-out a particular operation according to its principles.
 - the learners are taught “*how to do something*”, “*learning by doing.*”
 - These demonstrations are intended to teach skills such as right method of milking, dehorning, feed formulations, de-beaking in chicks, vaccinating, deworming, etc.

Demonstration...

2. Result Demonstration:

- 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/ innovation that is introduced to them as an option to their existing practice.
- Eg. effect of drugs on health of the animals, effect of vaccination on disease incidence.

3. Field demonstrations

- The main objective is to demonstrate ***newly released technologies*** and ***its management practices*** in the farmers' fields under different agro-climatic regions and farming situations.
- The purpose is to convince extension functionaries & farmers together about the potentialities of the technologies for further wide scale diffusion.
- Only ***proven technologies***(crop, livestock) are selected for field demonstrations.

4. 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.
- Training is rightly considered as a key input for human resource development and contributes substantially to face the challenges
- Training modality classified on the basis of
 1. contact with learner
 2. formalization of training
 3. management of training and content emphasis (Lynton and Pareek, 1990).

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 program.
- 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.