PRACTITIONERS' MANUAL

FARMER FIELD SCHOOL

For Promoting Goat-based Livelihoods in Rajasthan

ARAVALI

AGA KHAN FOUNDATION

Supported by the Aga Khan Foundation through the European Union funded SCALE Programme

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Foreword

Association for Rural Advancement through Voluntary Action and Local Involvement (ARAVALI) has been promoting livelihood innovations, building capacities of small and medium size NGOs and facilitate collaboration between Government and the Voluntary Organisations in the state of Rajasthan. ARAVALI has worked closely with over 60 voluntary organisations helping them through a process of training, exposure, accompaniment support and organisational development to understand the context of livelihoods based on natural resources. It has also helped address policy issues related to natural resources especially watershed management, rainfed agriculture and livestock management.

Goat husbandry has been an important component of the livelihoods portfolio of the poorer community segments across Rajasthan. The efforts towards consolidation of the sub-sector have been initiated in certain areas but the largest belt is around Ajmer, South Rajasthan, and Western Rajasthan. Also the poor specifically the women, landless and other marginalized groups who do not have other means for meeting their livelihood needs, depends on the goat husbandry. Goat rearing being a traditional practice suits the livelihood demands of the poorest of the poor mainly because of the short gestation period, low risk in capital investment and low cost of maintenance.

ARAVALI deliberated on the idea of introducing Farmer Field School (FFS) concept for increasing the number of voluntary agencies having an ability to work on issues related to the management of natural resources, especially in goat farming and on other dryland crops. As a preparatory step, it started exploring the possible training for the staff of ARAVALI and of the partner NGOs, looking at the FFS initiatives in India. Thereby partnership engagement was done with Agriculture Man Ecology Foundation (AMEF), Bangalore for Improving Livelihoods through Farmer Field School focusing on Goat based livelihoods enhancement in the state of Rajasthan.

A backdrop to this initiative emerges from ARAVALI's work in the Ajmer District through the social mobilisation project wherein around 800 women SHGs have been mobilized. This led to the emergence of goat husbandry as a major pro-poor activity in the area. To sustain and build upon this work, an extension approach which leads to community managed and controlled goat based livelihood enterprise was promoted under the Farmer Field School (FFS) approach for developing a Cadre of Farmer Field School Facilitators.

The experiential journey on the FFS initiative by ARAVALI, started with organising a two-day 'FFS Orientation Workshop' on 18th -19th January 2008 at Ajmer for its partner organisations and Community animators to know the concept of FFS, in collaboration with the AME Foundation. Thereafter a 'Short-term Training of

Facilitators' (SToF), 15–days' training was conceptualised on the FFS methodology and critical technologies of the goat-based enterprise. The SToF was conducted by the AME Foundation for the partner organisations of ARAVALI from central and western Rajasthan from 31st July-14th August 2008 at *Krishi Vigyan Kendra*, Ajmer, which was preceded by a three-day Curriculum Development Workshop from 27th-29th July 2008.
The SToF was followed by a season-long field internship on FFS under the guidance of master facilitators, so that the SToF facilitators do an on-field hands on practice of Goat based FFS before they qualify as fully trained facilitators.
Trainees' facilitators from SToF had initiated FFS with goat farmers with varied success. To streamline the FFS programme within partner organisations, a 4-days' Refresher Training of Facilitator (RToF) was then conducted from 25th-28th March 2009 at *GRAVIS* Field Centre *Kalran*, *Phalodi*, Jodhpur. Later on, a Farmer Field School Learning cum Certification workshop was organised from 23rd-26th November 2009 at *Krishi Vigyan Kendra*, Jalore, for the trainees who had completed the season-long FFS on Goat farming, to assess the FFS facilitation skills of the SToF trained and field trained FFS facilitators and certify the qualified FFS facilitator by ARAVALI and AME Foundation jointly. Finally 11 facilitators graduated as Certified FFS Facilitators (10 SToF trained and 1 field-trained), apart from these, there are 11 other, field trained facilitators developed in this specialised extension methodology, with ARAVALI's efforts. With two years of FFS field based engagement and practices and more so capacity building in the area of goat-based livelihoods development, need was felt to develop a Practitioner's Manual on FFS for Promoting Goat-based Livelihoods in Rajasthan.
ARAVALI would like to extend sincere thanks to AME Foundation, Bangalore for facilitating in taking up the FFS initiative and Sri Shivarathreeshwara Rural Development Foundation, Mysore for finalising the Practitioners' Manual on FFS for Promoting Goat-based Livelihoods in Rajasthan.
ARAVALI would also like to sincerely appreciate the support and cooperation being extended by the Aga Khan Foundation and the European Union for supporting the FFS initiative under SCALE programme along with partner organisation's who have taken forward the FFS experiences with the community.
From ARAVALI, special thanks to all the colleagues, who supported and contributed in the publication of the manual, with a special acknowledgement and mention of Mr. Dilip Kumar Yadav, Mr. Ishwar Babu Bairwa, Mr. Ambuj Kishore, Mr. Varun Sharma and Mr. Anil Kumar Jain for giving their continuous support and facilitating completion of the manual.

CONTENT

ABOUT THE MANUAL

1. Why this manual?

ARAVALI recognises that the issues relating to NRM and rural livelihoods are complex, diverse and challenging and hence there is a need for a multitude of organizations working together in synergy with shared responsibility. Through its many innovative efforts in NRM and rural livelihoods touching the lives of many, ARAVALI has garnered valuable experience and insights into NRM for improving agriculture and farm enterprises, including major initiatives in livestock, particularly the livelihoods of goat keepers. NRM and rural livelihood issues are addressed in their technical, ecological and institutional contexts involving various stakeholders - public as well as private. In the process, ARAVALI has come to believe that the various development institutions like the partner NGOs, government development departments and CBOs such as SHGs and the PRIs have a distinct but symbiotic role to perform for development to be an empowering and lasting process. In this background ARAVALI, through its rich pool of experience gathered over the years, seeks to position itself as a knowledge centre for every other stakeholder working on NRM and rural livelihoods. While the past experience is one essential ingredient with ARAVALI for it to grow as a knowledge centre the next prerequisites foreseen are, development of effective and efficient extension mechanisms and methodologies for servicing the poor in Rajasthan, and for this purpose, developing the capacities of its own team members and that of its partner organizations. As an Outreach Partner of Aga Khan Foundation– India (AKF-I) ARAVALI has been working on plugging this particular gap under its Sustainable Community based Approaches to Livelihood Enhancement (SCALE) programme. Efforts in this programme are aimed at building organizational competencies by developing a pool of trained human resource in suitable extension mechanisms among its own staff and its partner organizations. Introducing Farmer Field School is one such concrete step forward.

Further, the experience and findings of ARAVALI's UNDP-supported Social Mobilisation Project in Ajmer, wherein around 800 women SHGs had been mobilized, revealed the emergence of goat husbandry as a major pro-poor activity in the area. Looking at the importance of goat husbandry as a component in the livelihoods

portfolio of the poor community throughout Rajasthan (esp. around Ajmer, South Rajasthan, and Western Rajasthan), ARAVALI decided to develop a cadre of trained Facilitators of FFS and use FFS as an extension approach, which can lead to community-managed and community-controlled goat based livelihood enterprise promotion across the Western and Central regions of the state.

In this connection ARAVALI approached the Bangalore based NGO, AME Foundation, in 2008 for organizing 15-day duration Short-term Training of Facilitators (SToF) for her partner organisations of central and western Rajasthan on Farmer Field School (FFS) - Goat Farming, in Ajmer. The SToF was successfully organised in August 2008. Immediately after SToF, the trainees initiated FFS with goat farmers as an essential field practice component of their training, with varied success. A Refresher ToF (RToF) was then proposed by ARAVALI and conducted by AME Foundation in April 2009 in Phalodi, Jodhpur to streamline the FFS programme and to act as a refresher training for the SToF trained facilitators. During 2009, 12 of the SToF trained Facilitators completed season-long FFS on goat farming, followed by graduation of 11 of them as Trained FFS Facilitators by ARAVALI and AMEF.

During the last two years of FFS practice and capacity building in the area of goat-based livelihoods development, experiences of which have been positive, need has been felt to develop a Practitioners' Manual on FFS for Promoting Goat-based Livelihoods in Rajasthan. The Practitioners' Manual is hence developed for use by the trained FFS Facilitators based on the experiences and learnings emerging from the SToF and FFS on Goat Farming. This manual will be helpful to plan and conduct quality FFS on goat farming for promoting goat-based livelihoods in Rajasthan.

2. How will the manual help field level functionaries and non-government organizations

This manual is simple step-by-step guideline meant for the 'trained FFS facilitators' to plan and organize FFS on goat farming. This is not a guide for conducting either a season-long or a short duration ToF, nor is it meant for untrained facilitators to practice FFS. While every FFS is a unique experience in itself, the Facilitators, once become conversant with structuring and facilitating FFS on goat

farming, could then conduct FFS on many other livestock enterprises. A seasoned Facilitator could even conduct FFS on crop husbandry with some assistance on agro-eco system analysis.

There is still an unfinished debate globally on whether to treat FFS as an educational investment or an extension tool. For convenience ARAVALI considers the SToF as an educational phase where FFS Facilitators were trained. The trained Facilitators in turn conducting FFS on goat farming constitutes the extension part. This document provides a comprehensive guideline for conducting FFS; the partner organizations could make use of the Facilitators' facilitation skills to conduct quality FFS as well as use their honed up training skills beyond FFS to conduct qualitative training programmes. FFS covers technical aspects such as GESA, short studies, long term experiments and special topics. The NGOs could encourage their field functionaries or the Facilitators to use the manual in full or its elements independently in conventional training programmes like Training of Trainers, hands-on training opportunities, and the like. Similarly, non-technical contents such as facilitation skills, communication skills, moderation skills, energizers and group dynamics have a wide application in HRD efforts of organizations like induction, skill training, staff refresher training events etc.

3. How to create decision making and working milieu required for FFS program internalization and implementation

The broad ideas regarding the use of this document as a guideline for planning and organizing FFS on goat farming have been suggested above. The complete step-by-step process of FFS is presented in the four broad chapters of the document, which should be adequate for the trained Facilitators as a guide throughout the process of a full-fledged FFS. Part I provides background and contextual information and an overview of a day in FFS. Part II covers suggestions on structuring and designing the process as a preparation to plan FFS, particularly the curriculum and the session guides. The quality of FFS eventually depends on the quality of information gathered at this preparatory stage and its analysis in terms of identifying specific problems or learning opportunities in goat farming and the core element GESA that directly determines the effectiveness with which the decision making skills could be improved. Part III has useful

information on ensuring quality of facilitation. It is written more for the 'individual turning into an effective facilitator' where the art of keeping the FFS group motivated, developing personality traits that add to the effectiveness of a facilitator and the need for himself learning along with participants to keep learning as a constant process. Part IV gives technical inputs into goat farming and the related special topics to be used in FFS sessions based on the needs.

4. FFS as a pedagogy, modus operandi and way of doing things

A lot is written about the scope and utility of FFS as pedagogy. As the users of this Manual will find out, FFS does not follow a rigid training design; rather FFS follows a set of clearly defined principles and a broad framework of curriculum for the trainer to adopt in a given situation and make use of the opportunity to create a highly fertile learning environment. It is both an educational investment and an extension approach that combines the best of adult and non formal education principles for the trainer and the trainee to develop skills of observation, discovery, analysis and decision making on best course of action to solve the challenge on hand. It is a constant learning process that one volunteers to subject herself/ himself to get better and better at 'informed decision making' wherein imagination and creativity play a significant role in the problem-solving process. Therefore, the very term 'Manual' is rather a misnomer in the sense a manual implies strict 'how to do' instructions. Therefore, it is advisable that the present document may be seen more as a 'check list', an 'outline' or still better, a 'guideline' for planning and organizing quality FFS aimed at empowering goat farmers. While NGOs may use this 'checklist' to ensure their trained FFS Facilitators plan proper FFS in its spirit and principles, they may also use this 'outline' to review and make sure the experiential learning and discovery learning principles are not compromised. Further, the NGOs could encourage their field functionaries to use this document as a 'guideline' to bring out the best of their abilities in the process of improving the decision making skills of goat farmers and constantly generate new and deeper insights into issues associated with goat farming, thus contributing to the repository of knowledge of their respective organizations.

5. Goat development program - Context of Rajasthan and the NGOs vis-à-vis average educational status of facilitators, present facilitation skills, level of understanding of sectoral (goat) issues and appreciation of participative or FFS pedagogy

The recent SToF and FFS on goat farming was planned and organized by ARAVALI with the assistance from AME Foundation keeping in mind the matriculation-plus education and minimal field experience of the trainees in goat farming. The graduation of 11 out of 12 trainees is indicative of the fact that the SToF and the season-long FFS that followed were within the reach of such a modest audience. This also is a testimony to how an FFS provides opportunities to acquire technical knowhow in a systematic yet demystified way. Quite often, there are references to FFS making scientists out of farmers; by the same corollary the skills of setting up scientific experiments and systematic observation and analysis acquired during the FFS indeed induce scientific aptitude among the trainees, even among the much less educated farmers. Thus, an SToF followed by a few season-long FFS have a great potential to turn an individual with an average education, average facilitation skills, average level of understanding of sectoral issues into an excellent organizational asset to an extent there are evidences of surprising even the hard core scientists. The trick lies not only in the systematics of FFS pedagogy but also in its clear emphasis on celebrating the spirit of participatory learning at all stages.

PART 1

FARMER FIELD SCHOOL

CONCEPTS, HISTORY, PRINCIPLES AND CORE ACTIVITIES

1. FFS- Meaning and purpose

FFS is a discovery learning method, where the farmers are empowered individually and as a group so as to solve their field problems by fostering participation, interaction, joint-decision making and self confidence. In a learning situation through experimentation, FFS process builds farmers' skills for making decisions and taking appropriate action.

It is best described as 'school without walls', where farmers learn through observation and experimentation in their own situations.

FFS is not about technology but about people development. It brings farmers together for them to assess their problems and seek ways of addressing them.

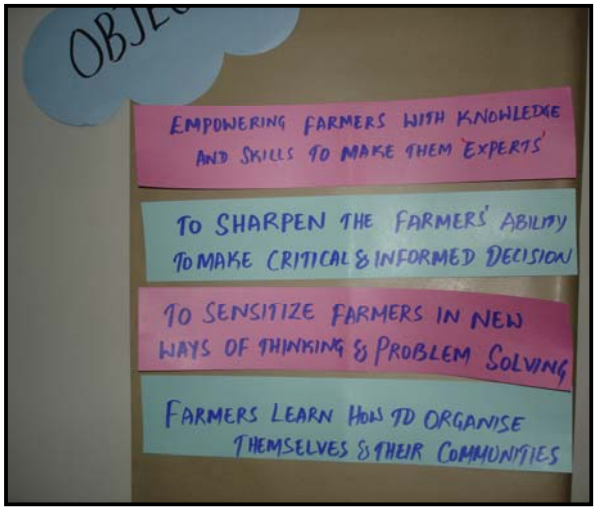
It is a participatory approach to extension, whereby farmers are given opportunity to make a choice in the methods of production through discovery based approach.

It is composed of groups of 20-25 farmers who meet regularly during the course of the FFS to experiment as a group with new management options.

In summary, a Farmer Field School (FFS) is a forum where farmers and facilitators debate observations; apply their previous experiences and present new information from outside the community. The results of the meetings are management decisions on what action to take. FFS is a dynamic process that is practiced and controlled by the farmers to transform their observations to create a more scientific understanding of the crop / livestock ecosystem. Thus, Farmer Field School is a process and not a goal. It aims to increase the capacity of farmers to test new technologies in their situations.

2. Objectives of FFS

- To empower farmers with knowledge and skills to make them experts in their own fields
- To sharpen farmers' ability to make critical and informed decisions so that they can make their farming profitable and sustainable
- To sensitize farmers on new ways of thinking and problem solving
- To help farmers learn how to organize themselves and their communities for collective action
- To enhance the relationship among farmers, extension functionaries and researchers, in order to work together to test, assess and adapt a variety of options available under specific local conditions.

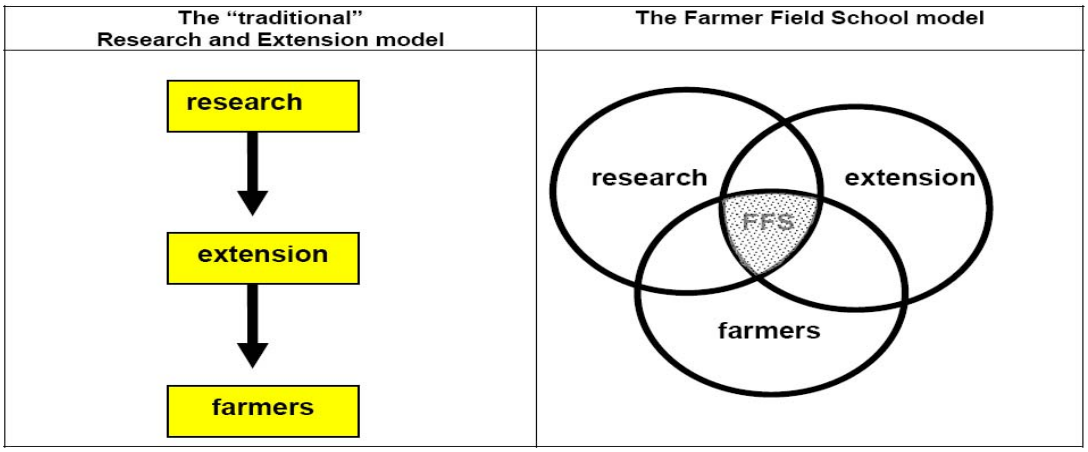


3. Philosophy of Farmer Field School

In a traditional research and extension system, research stations study topics and - in theory - deliver "answers" to the extension agencies which, in turn, have to pass on the information to the farmers. In this system, farmers are passive receivers of "packaged technology" which is not necessarily related to their actual field problems.

The FFS model links the expertise of various sources (farmers, research, extension and also other partners) into one platform: the FFS. In the FFS, all stakeholders are equal partners in providing locally adapted crop management practices. Researches and extension personnel learn from farmers through FFS compared to the traditional extension model and therefore, could help farmers better.

In a FFS, farmers are not just the passive receivers of technical knowledge, but they are provided with an opportunity to actively learn and achieve greater control over the conditions that they face every day in their fields.



Source: Gallagher (1999)

The three circles signify extension as a collaborative process and not a top-down process. It symbolizes putting farmers on equal footing with research and extension faculties both in order to emphasize farmers' need based research and extension and the spirit of keeping farmer at the centre of development.

In recent years FFS is gaining more popularity because of its effectiveness. FFS is unique from conventional extension system.

4. Conventional Training and Farmer Field School – a Comparison

Criteria	Conventional Training	Farmer Field School
Goal	Technology transfer	Empowering farmers
Extension worker role	Providing information	Creating learning situation
Experience of trainers	Variable, but most often lacking basic farming skills and experience.	Master trainer with farming experience gained during Training of Trainer programmes in which each person is required to grow crops/rear animals and carry out field studies so that they test what they will use in FFS later.
Information	Primarily top-down. Messages from distant research stations about situations presumed to be representative of farms.	Recommendations are tested against conventional practices and location specific new information emerges. Promotes local creativity.
Contact point	Mostly progressive and/or influential farmers.	Groups of interested farmers who meet regularly.

Criteria	Conventional Training	Farmer Field School
Time frame	Few hours to few days and often not based on needs.	A pre-defined period. Usually on a weekly basis over a season. FFS may be longer than a season, but never less than one season.
Pedagogy	Training: Use of static pre-determined demonstrations/ training schedules.	Education: A focus on underlying principles that allow farmers to derive and adopt basket of options for crop/livestock management within their own dynamic ecological, social and economic realities.
Evaluation	At best indirect: based on measuring delivery and funds spent.	Pre- and post-testing. Community self-surveying.
Training site	Demonstration field, training centers, home of Contact Farmer.	A shared field used to validate and test new management methods over the entire season.
Long term objectives	Increasing productivity. "Farmer's attitudes, lack of knowledge, and practices are constraints of a development process"	Nurture groups that will continue to address agricultural and community problems on their own and with technical backstopping. "Farmers as the subject of development"
Source of knowledge	Primary source of information is research stations assumed to develop representative models that are widely applicable.	A process and consequence of local testing and within-community/ecosystem learning.

Adapted from Gallagher (1999)

5. Why is FFS a season-long programme

An FFS is a season-long training for a number of reasons:

- Each stage of the crop/animal has different problems. This makes it necessary to spread the training over at least one entire season, covering all stages of the crop/animal.
- Each stage of the development has different requirements. So its management skills have to be based on the different development stages.
- Some processes that need to be observed would develop gradually over the period (seed to seed or kid to kid)
- The results of management decisions made during one stage can only be observed at a later stage of the crop/animal development. It is especially important to be able to observe how each action has an effect over the time.

6. History of FFS

The Food and Agriculture Organization of the United Nations (FAO) developed the Farmer Field School (FFS) approach in 1989. It was used to train rice farmers in Indonesia on Integrated Pest Management (IPM) as part of their National IPM programme. The approach proved to be very successful in helping to control rice pests and was quickly expanded to other countries like Asia, Africa, Middle East and Latin America. In 1995, the FFS program began to broaden its scope beyond IPM to cover other types of agricultural production and incorporate socio-ecological conditions.

In India, the FAO Inter-Country IPM Programme for rice started in 1994, followed by the FAO-EU IPM Programme for cotton in Asia during 2000-2004. Realizing the effectiveness of FFS and the economic and social benefits to resource-poor farmers, the state governments of Andhra Pradesh, Karnataka and Maharashtra have taken steps to institutionalize the IPM-FFS model for cotton and other crops in their mainstream extension. From 2004 onwards, the state governments modified the existing extension approach from “demonstrations” to FFS so as to enable farmers to evaluate technologies by themselves. In addition, in 2005, the Technology Mission on Cotton (TMC) instructed the state governments to undertake Training of Facilitators (ToF) and FFS instead of “demonstrations”, which resulted in more State Governments taking on the approach. Some NGOs, other development agencies and farmer

associations/clubs have also inducted IPM in their activities. Others have adopted the FFS approach for educating farmers on water and soil conservation.

7. Principles of FFS

Every FFS is guided by the following 10 principles:

a. Learning by doing

Adults do not change their behaviour and practices just because someone tells them what to do or how to change. They learn better through experience than from passive listening at lectures or demonstrations. Experiential/discovery-based learning is an essential part of FFS as it helps participants to develop a feeling of ownership and to gain confidence that they are able to reproduce the activities and results on their own farm.

b. Farmer-led learning activities

Farmers, not the facilitator, decide what is relevant to them and what they want the FFS to address. This ensures that the information is relevant and tailored to their actual needs. The facilitator simply guides the farmers through their learning process by creating participatory exercises to provide farmers with new experiences.

c. Learning from mistakes

Behavioural change requires time and patience. Learning is an evolutionary process characterized by free and open communication, confrontation, acceptance, respect and the right to make mistakes. This last point is important as more is often learned from mistakes than from successes. Each person’s experience of reality is unique.

d. Learn how to learn

Farmers are learning the necessary skills to improve their ability to observe and analyze their own problems and make conscious decisions. They also learn how they can educate and develop themselves further. FFS process ‘Helps the farmers to help themselves’.

e. Problems are not constraints but challenges

Problems are presented as challenges, not constraints. Farmer groups learn different analytical methods to help them gain the ability to identify and solve any problem they may encounter in the field.

f. The farmer's field is the learning ground

All activities are organized around it. Farmers learn directly from what they observe, collect and experience in their fields instead of text books, pictures or other extension materials. Farmers also produce their own learning materials (drawings, models, etc.) based on what they observe. The advantages of these home-made materials are that they are consistent with local conditions, inexpensive to develop, and owned by the farmers.

g. Extension workers are facilitators, not teachers

Extension workers are called as facilitators because their role is to guide the learning process and not to teach. The facilitator contributes to the discussions and aims to reach consensus on what actions need to be taken. Facilitators are trained in a Training of Facilitators (ToF) course developed by experienced FFS Master Trainers.

h. Unity is strength

Empowerment through collective action is essential. Farmers united in a group have more power than individuals. Also, when recognized as an active member within a group, the social role of individuals in a community is enhanced. The combination of two or more minds is often more successful than one mind on its own. FFS expresses this as 1 + 1 = 3; i.e. one mind + one mind creates a new, third mind.

i. Every FFS is unique

Learning topics within the FFS are based on the farmers' need. Training activities must be based on existing gaps in the community's knowledge and skills and should also take into consideration its level of understanding. Every group is different and has its own needs and realities. As participants develop their own content, each FFS is unique.

j. Systematic training process

All FFS follow the same systematic training process. The key steps are observation, group discussion, analysis, decision making and action planning. Past FFS experience has shown that the best results are achieved with weekly meetings.

Longer gaps can slow down the learning process. The length of the FFS cycle depends on the focal activity. With crop, a full season is usually needed to allow for all seasonal variations to be studied, whereas livestock FFS requires one full year. Inclusion of marketing and processing activities in FFS increasingly may lengthen the FFS learning cycle.

Usually in a FFS session, farmers take decisions based on the observations and analysis of farm ecosystem and subsequently implement the decision in learning field. Based on the learnings, farmers adopt certain practices in their own fields. Farmers share the outcomes with fellow farmers during FFS in the next session. These may lead to new topics/studies in FFS.

8. Elements of FF and Core Activities

a. Elements of FFS

There are some critical elements in any FFS, irrespective of the crop/ecosystem/topic that are essential for running a FFS. Each of these elements has to be selected/developed properly for maximum results. The important elements are:

(i) The Facilitator

Facilitator is one who guides a learning process in FFS. He/she ensures effective flow of information within a group so that participants can share information and arrive at a decision. Each FFS needs two trained facilitators to lead members through the hands-on exercises.

(ii) The FFS group

A group of farmers (20-25) with a common interest form the core of the FFS. The group may be mixed with men and women together, or separated, depending on the situation. The group could be an established one, such as a self-help, women or youth group. However, care should be taken that they have a common interest.

(iii) The Learning site

FFS is about practical, hands-on exercise. In FFS, the field is the learning ground, and it provides most of the training materials like plants, livestock, insects, diseases, problems and opportunities. Farmers are usually much more comfortable in field situations than in classrooms.

In case of goat FFS, goat-herd is the learning site. One of the FFS farmers, need to provide the learning site. The farmer who provides the learning site for the FFS is called as Collaborator. Collaborator is selected in a meeting before the start of FFS sessions based on the consensus of all the farmers. To facilitate the process, following criteria may be considered:

- Should be accessible and acceptable to all members
- "Goat herd", learning site should represent the village (herd size, problems, management practices). Herd size of 8-10 goats may be considered.
- Collaborator should be active, co-operative, willing to take up studies and implement group decisions
- The learning site should be free from disturbances
- Should have sufficient working space having shade for group work

(iv) The Curriculum

It is a broad outline of content for conducting FFS and it is based on the focal activity, season and local situation. Always the curriculum is flexible and should be modified based on the needs of the farmers. It is developed in a participatory method by involving the farmers, subject experts and extension workers.

b. Core activities of FFS

FFS is a participatory learning process. Hence, a set of learning situations is created to facilitate effective learning. These form the core activities of FFS.

I. Field comparative studies
II. AESA-Agro Eco System Analysis (GESA-Goat Eco System Analysis in case of FFS on goat)
III. Special topics
IV. Group dynamic exercises
V. Participatory Monitoring and Evaluation (PM&E)

I. Field comparative studies

Field comparative study is a collective investigation process to solve local problems. Simple studies are carried out to enhance farmers' observation and analytical skills to investigate the cause and effect of major problems. These studies help farmers to make right decision and become experts. They also learn how to design simple studies to test and select the best solution to their problems.

Studies also encourage the validation and adoption of new technologies or practices. In this case, the studies compare farmer practices with available solutions presented either by the researchers, other farmers or facilitator. By analyzing the results and developing record keeping skills, farmers are able to decide which solution (technology or practice) is best suited to their situation.

Each study should include a cost–benefit analysis using the data recorded. Assessing the economics of each option improves decision-making skills for crop/livestock production activity, as farmers often do not know whether they operate at a profit or loss.

Besides recording and analyzing the financial costs and benefits of the options tested in the study, other indicators to validate the results of the experiment should be identified by FFS participants (e.g. labour needs, length and speed of growth, accessibility). Precise record keeping of indicators is required to monitor and evaluate the performance of a treatment or technology.

Depending upon the objective of the study, duration of study varies from few minutes to few months. The frequency and type of observations to be recorded depends on the objective and duration of the study.

II. Agro Eco System Analysis (AESA) - the heart of FFS

Various interactions occur in an agro-ecosystem, which influences the performance of a crop / livestock. Understanding of these interactions helps in making quality decisions for better crop management.

The objective of AESA is to make decision for the management of the crop based on thorough observation of field situation and analysis. Agro ecosystem analysis (AESA) stipulates weekly/fortnightly field observation on various biotic and abiotic factors and analysis of situation taking into consideration the inter-relationship among the factors. The analysis leads to taking a quality decision on appropriate management practices. Farmers in subgroups of 5-6 members conduct AESA. This provides ample opportunity for each member to learn.

The quality of FFS largely depends on the AESA quality. AESA is considered to be the 'heart' of FFS, as it sharpens the decision-making ability of the farmers. FFS is meant for that.

AESA exercises improve decision-making skills by:

- Enhancing observational skills
- Developing record keeping skills by drawing simple forms
- Generating discussions and sharing of farmer-to-farmer experience
- Developing presentation skills to promote community decisions.

III. Special topics (ST)

In FFS, farmers mainly learn through 'field comparative studies'. However, certain issues cannot be dealt through studies. In such cases, detailed discussions are organized as special topics. For example, collective marketing, establishing linkages with development agencies, etc.

Special topics are sometimes dealt by external resource persons for understanding of a particular topic/problem in depth. Special topic may lead to field studies.

General guidelines for facilitating 'Special topics'
Issues related to livestock and other relevant topics are considered for special topics. This gives participants a chance to learn about anything they feel is important to their livelihood. The facilitator can handle special topics, when he/she is familiar with the subject. In special cases, a resource person can be invited to the training.

Objectives

- To provide an opportunity for the facilitator (or resource person) to give input needed for a general understanding of the subject
- To ensure farmers have access to the information they need at the required time
- To create common knowledge on key issues among the entire group.

Resource persons like researchers, university professors, visitors and experts, NGO representatives, or others can provide some refreshing inputs in FFS. However, it is important to provide some tips to these resource persons:

- Background information on FFS and the group
- Go to the field together for field walks where questions and answers can take place.
- Leave slides and lectures until after field interactions.
- Request the resource person to be as "participatory" as possible.
- Be sure that the resource person gives an address and other contact information for future reference by trainees/farmers.

Following issues could be dealt as special topics

- Facilities available in the department of animal husbandry
- Facilities in the bank
- Human diet
- Gender issues
- Importance of Networking FFS groups
- Collective initiatives for input mobilization, marketing, mass planting of seedlings, etc.

IV. Group dynamic exercises

Apart from technical knowledge, farmers also require skills on communication, group strengthening, problem solving and leadership. Group dynamic exercises facilitate the farmers to acquire these skills. Farmers learn with fun through ‘group dynamic exercises’.

V. Participatory monitoring and evaluation (PM&E)

The participants and facilitators need to be able to continuously assess whether they are making positive changes and achieving the goals they set. Monitoring and Evaluation (M&E) methods have been developed to help FFS practitioners (mainly project staff, facilitators and participants) actively observe and analyze situations and performances and help them understand what they are observing.

9. Phases in organization of Farmer Field Schools

Broadly there are three phases in FFS implementation

I. Preparation phase

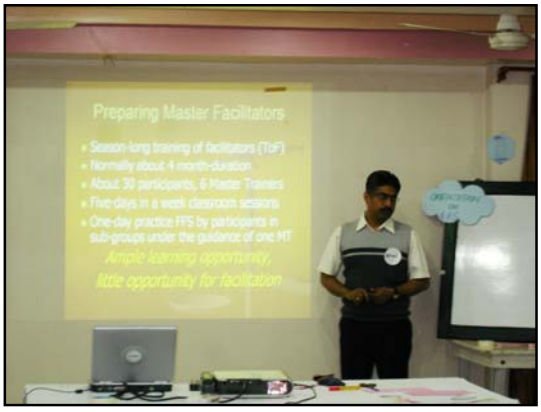
This phase includes the steps leading up to the actual implementation of FFS core activities.

Step 1. Groundwork

- Macro-level understanding of livelihood status of goat farmers in Rajasthan through simple survey.
- Selection of suitable project location/s.
- Understanding the efforts made by different development agencies to improve the livelihoods of farmers in the region.
- Looking for FFS experts in the region to support the FFS programme
- Discussion with potential project staff and/or partner agencies to formulate the FFS programme.
- Project formulation by involving the implementing agencies and getting approval from the donors / Government agencies.

Step 2. Training of Facilitators

Extension workers or farmers need to participate in a season-long or short duration Training of Facilitators (ToF) organized by experienced FFS Master Trainers prior to facilitating an FFS. It is also referred to as Training of Trainers (ToT). The details are discussed in part 2.



Step 3. Selection of villages and farmers

Village and farmers selection is a critical step in successful implementation of FFS. One should take utmost care while selecting the villages and farmers as it is difficult to correct it in the midcourse.

Step 4. Participatory curriculum development

In conventional trainings, the 'subject expert' at the macro-level decides what farmers should be taught. So, mostly the training content is irrelevant to the farmers needs leading to ineffective trainings. But, in FFS approach actually farmers decide what they want to learn by participating in the curriculum development process. Along with farmers, researchers, local extension workers and facilitators are involved in the process.

A curriculum, no matter how carefully it is developed, is bound to change during the course of the FFS due to dynamic field conditions or other factors.

II. Implementation phase

Step 5. Conducting FFS sessions with core activities

Step 6. Study tours

Study tour is one of the most effective extension tools. For both farmers and facilitators it can be very useful to visit another FFS, possibly in one of the surrounding areas. It also comes in handy to expose the new FFS group to the established group for vision building.

For facilitators, it can be very inspiring to visit colleague-facilitators to monitor the process and content of another FFS. This is "cross-learning". Ideas, problems, suggestions for improvements can be exchanged to the mutual benefit of both visiting and hosting facilitator.

Step 7. Scaling up of the learnings

FFS group is the representative of the entire village. Efforts should be made to spread the learnings simultaneously during FFS. Field trainings, field visits, sharing sessions involving existing community based organizations like SHGs, farmers clubs, youth clubs, NGOs , etc. can be organized by FFS farmers and / or facilitators. Other methods like wall paintings, campaigns, street plays, video show, radio talk, exhibitions, newsletters, case studies can be used to create awareness with large number of farmers.

These efforts provide an opportunity for non-participants to be exposed to the FFS farmers' lessons and the skills and knowledge gained in the process.

Step 8. Field day and graduation

Field days provide the FFS members with an opportunity to display and share their experiences, e.g. the experimentation results and learning activities, including group dynamics. Field days reinforce the FFS cohesion and raise awareness among the community, the government and other organizations in the area, creating support and new demand for FFS. Field days are usually organized at the flag end of the FFS.

Farmers with a satisfactory performance (e.g. 75% attendance, practices adoption) can graduate for the specific activities completed during the FFS meetings. The graduation is organized by the farmers and the facilitator and involves an official ceremony to which community members, officials and neighbouring communities are invited.

In addition, press and other local media can be invited to join the Field Day for extra publication in Agricultural magazines or local newspapers, radio or TV.

Participants are awarded a certificate by the supporting agency/programme to recognize their efforts and celebrate their achievements. At the same time, other

community members will be attracted and the event marks the end of an official learning period

III. Post FFS phase

Step 9. Follow up FFS

The needs of farmers after undergoing one season of FFS are different. They should continue their learning process to find solutions to their new problems of same enterprise (goat) or other enterprise (crop, diary, etc). In follow up FFS farmers continue to establish the studies with the minimal support of facilitators. Here, lead farmers take the role of facilitators. Also, focus is given to adoption and spread of the practices learnt in the FFS along with collective initiatives by the group.

Step 10. Networking of FFS groups

When there are several FFS in a region, FFS networks should be encouraged in lines of SHG federation. Networking is a mechanism to sustain the developmental activities through existing and new FFS in the region.

Advantages of having a FFS network

- To act as agency to develop human resource and initiate new FFS
- To play catalytic role in scaling up of sustainable development solutions
- To facilitate in cross learning among communities
- To promote collective initiations (input mobilization, marketing)
- To bridge the gaps between community and the development agencies
- To approach different agencies to take up developmental activities

Step 11. Organizing FFS by Farmer Facilitators

Developing local resource persons has a significant role in sustaining the development process in a given region. As the local resource persons belong to the community their services are easily available to the people. FFS graduated, potential farmers are identified and trained on FFS methodology and goat rearing to serve as resource persons. They are also called as Farmer Facilitators. These Farmer Facilitators' services are handy to support the follow up FFS and new FFS.

PART 2

FFS – THE STRUCTURE AND PROCESS

1. Training of Facilitators

In a typical season-long ToF, ranging from 4 to 6 months, about 25-30 trainees are trained to become proficient in the principles of growing a crop or rearing livestock and in learning how to implement an FFS programme. Here, the learning approach is non-formal and is based on experiential learning principles. During the ToF, the participants practice FFS with farmers either in pairs or in sub-groups of four to five members to gain practical skills in organizing FFS.

However, efforts are made in different parts of the world to shorten the duration of ToF to 2 to 4 weeks. In a short-term ToF, the focus is on preparing the participants in the principles and core elements of FFS methodology and facilitation skills. Additional trainings on specific topics of technical and methodological nature are necessary to further develop their capacity as FFS facilitators. After SToF, the participants should practice FFS under the guidance of expert facilitators. Thus, unlike in a full season residential ToF, the trainees of a SToF become facilitators by undergoing 2-4 week SToF followed by need based additional training and at least one season long practice FFS.

By the end of SToF, the trainees should be able to,

- Understand the principles and core activities of FFS to establish a Farmer Field School
- Acquire FFS planning and facilitation skills
- Understand, explain and apply NFE methods, processes and group dynamics
- Understand, explain and apply experiential learning processes

Tips for selection of participants for ToF/ SToF

- Matriculation and above educational qualification is ideal
- Are preferably 25– 45 years of age
- Should have experience in farming and/or in agriculture development programmes
- Preferably belong to the same region/community
- Are respected in the community
- Are willingness to serve in rural area

- Know the principles and problems of rearing livestock / growing a crop
- Make effective decisions with regard to livestock management and or crop management, considering the local ecological, social and economic situations
- Develop ability to solve new problems emerging in the field
- Gain basic knowledge on budgeting necessary to organize and conduct FFS in their locations.

2. Selection of farmers for FFS

Selection of a village and farmers is a critical step in successful implementation of FFS. One should take utmost care while selecting the villages and farmers as it will be difficult to correct it in the midcourse.

A group of farmers (20-25) with a common interest form the core of FFS. The group may be mixed with men and women together, or separate, depending on the situation. The group could be an established one, such as self-help, women or youth group. However, care should be taken that they have a common interest.

Stages in farmers' selection

- Select potential villages based on the objectives of the project.
- Meet village leaders to brief them about FFS programme and request them to organize a village meeting, gramsabha.
- Hold gramsabha to create awareness on the FFS programme. Conduct an entry point activity to create interest among the farmers (For e.g. role play, video show, deworming, vaccination).

Suggested criteria for selection of villages

- Majority of the farmers' livelihood should depend on goat rearing
- Intensive problems in goat rearing
- Preferably away from town/cities
- Absence of similar programmes in the past or presence.
- Lack of awareness on sustainable goat rearing practices amongst the farmers in the village
- Better to avoid political or socially sensitive villages
- Medium populated villages are preferred.
- Better to consult PRI (Panchayat Raj Institutions), development agencies like Dept. of animal husbandry and civil society organizations while selecting the villages

- To keep the selection process unbiased, set the criteria for selection of farmers in the gramsabha considering project requirements.
- Gramsabha nominates interested farmers to participate in the FFS as representatives of the entire village. By this way it becomes an obligation for the selected farmers to share the learnings with the community.

Suggested criteria for selection of FFS participants

- Active farmer
- Small or marginal farmer (<10 goats)
- Willingness to participate
- Ready to work in a group
- Socially acceptable
- Preferably from same village
- Willing to follow the norms set by the group
- At least 1/3rd women participation

- Form a group of interested farmers emerging from gramsabha.
- Facilitate two or three meetings with the group to finalize FFS participants (20-25 farmers) based on their interest.

3. Participatory Curriculum Development

In conventional training, the 'subject expert' at the macro-level decides what farmers should learn. Therefore, often the training content is irrelevant to the farmers' needs leading to ineffective training. But, in FFS approach farmers decide what they want to learn by participating in the curriculum development process. Along with the farmers, researchers, local extension workers and facilitators are also involved in designing the curriculum.

A curriculum, no matter how carefully it is developed, is bound to change during the course of the FFS due to the dynamic nature of field conditions or the changing needs of the farmers.

Objectives of Curriculum Development Workshop

- To analyze the problems and opportunities in goat rearing
- To develop the content for FFS based on situational analysis
- To arrive at FFS monitoring and evaluation mechanism

Steps to develop FFS curriculum

1. Problem identification: Conduct suitable PRA tools and baseline surveys to collect information about the existing situation and to identify the major problems.
2. Problem analysis: Systematic analysis of problems is required to prioritize problems and to understand the cause-effect relationship. Discussion with experts and literature review is helpful for this purpose.
3. Listing of potential solutions: Discuss all possible options available to solve the problems. Consider options from farmers, facilitators, livestock department, research stations and any other reliable sources.
4. Design field studies and special topics based on the problems/needs.
5. Plan routine activities like GESA and group dynamic exercises.
6. Plan 'participatory monitoring and evaluation' activities.
7. Plan scaling up strategies.
8. Plan number of sessions based on the seasonal calendar and needs of the farmers.
9. Schedule all core activities and scaling up activities in different sessions of FFS.
10. Plan time, place and logistics for FFS sessions.
11. Plan budget.

4. Inauguration of FFS

An inauguration is a formal ceremony to mark the beginning of Farmer Field School.

Objectives

- To increase interest among participating farmers in the FFS
- To publicize the event among the community members
- To sensitize the developmental agencies on the programme
- To seek support from different agencies

Suggested list of participants

Officials from department of animal husbandry / agriculture / bank, Implementing NGO staff, representatives from other NGOs interested in such

programmes, FFS graduated farmer (if available), representatives of PRI (Panchayat Raj Institutes), FFS facilitators and FFS participating farmers.

Time: 3 hours (excluding preparation time)

Steps

Before programme

- Conduct a preliminary planning meeting with the farmers (approximately 10 days before the planned date). Discuss on the guests to be involved, logistics arrangement and programme schedule.
- Approach the listed guests and confirm their participation in the FFS inauguration programme.
- Conduct the final planning meeting with the farmers after getting the confirmation from the guests.
- Regular follow up for making all logistic arrangements.

During the programme

Suggested checklist of activities in the programme

- Welcome by farmers' group
- Purpose of the programme, FFS programme in the village by FFS facilitator
- Experience sharing by FFS graduated farmer
- Process followed to initiate the FFS in the village (E.g. gramsabha, baseline survey, CDW) by FFS participants
- Address by guests
- Vote of thanks

Tips for facilitators

- Ensure at least few guests who attending the inauguration programme will also attend the field day; they will be in a better position to recognize the changes before and after FFS.
- Ensure media coverage of the event

5. Goat Eco System Analysis (GESA)

The GESA is a tool for gathering information about the components of goat ecosystem, understanding goats in relation to their interactions with the ecosystem and placing the goat farmers in a decision-making process. This involves regular observation of the goat ecosystem. It promotes learning by experience and discovery, helps farmers understand influence of biotic and abiotic factors on goat and make better management decisions.

Objective

To improve decision-making skills through systematic analysis of a situation by observation, analysis and discussion.

Materials

Thermometer, Polythene bags, vials, drawing sheets, Camlin brush, forceps, weighing scale, magnifying glass

Time: One and a half hour.

Steps

GESA has three steps namely observation, analysis and decision making. Every GESA will follow the same sequence. However, when GESA is introduced for the first time, discussion on the concept of ecosystem, observations to be made and their importance, analysis of

An ecosystem consists of living and non-living things that all interact with each other. Examples of living things include goats, ticks, mosquitoes, grass, crop, pests, microbes and trees. Examples of nonliving things include stones, farm structures, etc. An ecosystem functions within the physical environment that includes air, water, soil, wind, etc.

There is a need to understand the components of a particular ecosystem and how their interactions influence each other. Some interactions result in benefits, while others lead to losses. There is a need to maximize the positive results and to minimize the negative ones through better management. Hence, farmers should understand the functions and interactions of various components.

Examples for positive and negative interactions:

Good housing and balanced nutrition improve the health of goat. Parasites, wounds, swollen udder affect the health of goat adversely.

Environmental factors such as high temperature, severe cold and rainfall will have an influence on the attack and spread of diseases, parasites and overall health of goat. Without considering such interactions, chances of taking erroneous management decision are more.

observations, depicting the ecosystem on the chart, decision making through analysis and consensus, play a crucial role.

- Briefly discuss the concept of an ecosystem, its components and interactions.

Observation

Ask the participants in subgroups

- What needs to be observed and the information to be collected, which enables them to take appropriate management decisions under a particular situation.
- List the parameters and add the additional parameters, if required. The parameters identified should be categorized into general information (normally captured only once e.g., date of birth of the animal, breed), those that need periodic updating (e.g., pregnancy status) and those that need frequent measurements (e.g., body weight, health status).
- To develop GESA observation sheet based on the above information. Modify the observation sheet according to field studies and features observed in the field. Refer the example.
- How to record the observations and significance of making each observation.
- To observe and collect information.

Analysis

Ask the participants in subgroups

- To process the field observations (working out averages, percentages, comparing with previous observations).
- To depict the observations on the GESA chart.
- To discuss the inter-relationship among different factors of the eco system which have an influence on health condition of the goat.

Decision Making

- Ask the participants in subgroups to make decisions based on the analysis of the ecosystem.
- Each sub-group presents its results in a plenary session and receives feedback from the other sub-groups. They then compare their results.

- The whole group comes up with a consensus that forms the basis for future management decisions.
- Discuss the cost involved in implementing the decisions taken and potential benefits.

GESA observation sheet

GESA No.		Date and time	Venue:
Title of the experiment	Comparison of sustainable goat rearing practice v/s prevailing practice		
Treatment			
A. General Information			
Name of the farmer			
Date of birth of goat		Breed	
Details of last treatments given to goat (mainly vaccination):			
B. Observations			
Parameter to be observed	**How to make observation / what to focus**	**Observations**	
Skin and hair	Shininess / dull		
External parasites	Observe the entire body. Focus on ears and neck. List different types of parasites.		
Internal parasites	Closely observe the faecal matter for the presence of parasites		
Udder	Swelling		
Hooves	Wounds		
Temperature	Insert thermometer in the anus and record the temperature		
Eye	Colour and discharge		
Tongue	Colour		
Teeth	Numbers		
Tail	Wagging, position		
Heartbeat per minute			
Rumen movement			
Regurgitation			
Nose	Discharge		
Fecal matter			

6. Group dynamics (GD)

Working with groups means dealing with heterogeneous people differing in characters, educational background, age, experience, etc. And that is not always easy. Group dynamic exercises help a facilitator to work with a group and develop a true “Team” out of it. The term "Team" is used here to emphasize that a group needs to work together with common goals for common interests and that teams often have structure.

Group dynamic exercises provide a powerful tool to develop communication skills, group cohesiveness, problem solving skills and leadership, and encourage collaboration and creativity. Additionally, they help to enliven the atmosphere and energize the participants. Many activities are physical and active, while others are brainteasers. These exercises are generally fun while simultaneously providing a specific experience to the participants to think about, for instance, on how they worked as a team or solved a problem together. Furthermore, people tend to remember the exercises and thus the message.

To apply group dynamics properly, the facilitator should keep the following in mind:

- Be clear about what you want to achieve with the exercise
- Be aware of the appropriate moment for a GD, e.g., do an exercise to energies people when they are feeling tired, or to tackle conflict if you see one arising, plan and prepare the exercises and always add a ‘head’ and a ‘tail’ (introduction and analysis)
- Good exercises involve everyone in the group
- Exercises should be adapted to local and cultural conditions and should not offend people or make them feel embarrassed
- Vary the type and use of the exercises – don’t only do exercises that energies
- Treat group dynamic exercises as a toolbox – do not become trapped in a fixed formula
- Remember that each FFS is unique and exercises should be modified for each FFS
- Encourage farmers to conduct their own exercises

- Name the GD exercise at the end of the session in discussion with participants. This helps in better remembrance.

Session guides on Group Dynamics are given in **Annexure 3**

7. Session guide preparation

Session guide is a written document, which assists the facilitator to conduct sessions more effectively. To facilitate any session in FFS, a session guide is essential. It consists of step-by-step procedure on how to facilitate a particular session. Whatever the experience of the facilitator may be, referring the session guide helps to conduct the session professionally.

Preparing a session guide requires lot of practical experience, imagination and skill. Session guides are prepared by facilitators, which are situation specific. Normally, session guides are prepared after the CDW. If session guides are available, one can use with necessary modifications to suit the local conditions.

The structure of the session guide includes the following content:

Introduction

The introduction should include background of the topic, relevance: Why do we intend to conduct the session, importance, practical utility and application of the particular activity.

Objective

A particular session can have more than one objective. The purpose of any session is either to impart knowledge, introduce new skills and/or change attitudes; the objectives should focus on them.

Framing the objectives with an action verb makes the process action oriented and participatory. Some of the action verbs commonly used are demonstrate, discuss, list, state, identify, etc.

Materials

List the materials based on the content, procedure and number of participants. Ensure all the materials are listed because non-availability of a small material may affect the whole process.

Time required

Fix the duration of the session based on the objectives and procedure.

Steps

List all possible steps in sequence to facilitate a session. Choose appropriate methodologies, which ensure active participation of all the participants. Provide useful additional information as a box item.

Debriefing

Debriefing is done to evaluate the session by asking questions. Turn the objectives into questions.

8. Comparative studies

General guidelines

Facilitating field comparative studies is a process of collective investigation with the purpose of initiating activities or testing solutions to solve local problems. The main basis for experimentation in FFS is to create a learning process through which farmers test, monitor and evaluate new ideas, technologies or innovations for improving goat rearing. Farmer practices are tested and compared with other available solutions to solve an identified problem.

Analyzing the results allows farmers to decide which solution (technology and/or practice) is best suited to his/her situation. Field experiments are also used to demonstrate new production opportunities and to help farmers diversify.

Objectives

- Help the farmer become an expert and design quality experiments; the principle of ‘learning how to learn’ rather than learning about one technology.
- Enhance FFS participants’ observational and analytical skills and empower them to produce meaningful results.
- Help farmers acquire the skills needed to learn about new technology options and practices and to decide which solutions are most appropriate.

Steps

Field comparative studies in FFS should combine local knowledge and skills with conventional methods and/or technologies to develop solutions suited to a specific situation. Good planning is the basis for systematic experimentation, which involves a range of steps outlined below.

Planning

- Define the objective of the experiment, which should be linked to the previously identified local priority problem.
- List different treatments/options, which should include a mixture of farmer generated ideas and 'new' options (e.g., practices introduced by research/extension staff).
- Do not have more than three treatments/options as it makes the experiment too complex.
- The treatments should be kept as simple as possible by having only one factor under study. If the experiment has too many variables it will be very difficult to evaluate which one is responsible for the results. Similarly, if the treatments are very similar it will not be possible to see any difference. There are two ways of reducing errors, i) Create uniform situation/factors (e.g. breed, housing and age of goat); and ii) replicate the treatments. The more the number of replications, the surer one can be that the final results are valid and that correct conclusions can be drawn. However, too many replications make the experimental design complicated and difficult to implement in the field (two to three are generally suggested).
- Discuss the time frame of the experiment, then identify a suitable site, materials and local providers and develop a precise budget. It is also important to identify participants' roles and responsibilities: Who should do what? It is important that everybody has a chance to participate in every activity taking place.
- When deciding where to locate the field trial, do not be influenced by personal bias. Instead, try to locate the treatments randomly. An exercise to facilitate randomization is to put cards with all the treatments in a bag and pick the treatments one by one; this will dictate the order of the set up.

- Indicators for evaluating the studies need to be developed with the participants. Drawing reliable conclusions from the results of experiments depends on keeping good quality records.

Implementation of studies

When the design of the experiment is clear to all participants, the experiment can be implemented in the field. If an FFS group does more experiments at a time, it is suggested that each experiment be allocated to sub-groups who will be responsible for the implementation, record keeping and analysis. Even though studies are conducted in subgroups, ensure that the process of studying and learning becomes the experience of all participating farmers.

Conclusion of studies

In this phase of the experiment, all the data collected should be analyzed. An important tool is the cost–benefit analysis but for less tangible indicators, e.g., the taste of milk, the participants have to come up with criteria to quantify the outcomes (e.g., very good taste – average taste – poor taste).

Using PM&E methods, the facilitator can evaluate FFS participants' perceptions and level of adoption of technologies on their own farms. In addition, the knowledge they gain from the experiments can be assessed. Benefits, constraints and barriers to adoption can be identified and discussed in plenary sessions.

Results of experiments should be shared with the community and neighbours during field days and with other resource persons with a view to improving overall production and extending lessons and benefits beyond the FFS.

9. FFS day planning and implementation

A typical day in the FFS includes all the core activities and requires about 3-4 hours to complete. An example of the day's schedule is given below.

FFS programme is flexible depending upon the time availability and season. In case of goat FFS, GESA and comparative studies which require herd of goats should be done in the morning time. Those sessions which do not require the herd of goats can be done in the evening hours. However, it is ideal to complete all sessions at a stretch.

A day in FFS

Time	**Activity**
7.00 AM	Recap of the previous session's activities and briefing the day's activities
7.15 AM	Goat Eco System Analysis (GESA)
9.00 AM	Break
9.30 AM	Group dynamic exercise
10.00 AM	Field comparative study / Special topic/ Observations/Conclusion
10.40 AM	Planning for the next session
10.50 AM	Review of day's activities and closure

Facilitators prepare session guide, arrange all materials required and prepare programme schedule for the FFS a minimum of one day before FFS.

10. Participatory Monitoring and Evaluation (PM&E)

PM&E plan is an extension of the participatory plan developed in the initial FFS stages. To implement FFS, both the participants and facilitator need to be able to continuously assess whether they are making positive changes and are actually achieving the set goals.

PM&E of FFS has three steps. The first step is to monitor each session with the goal to ensuring both the content and process part of FFS are in line with the standards of FFS. Also, to know whether the farmers have learnt some useful management skills, ecology, or other issues that makes it worth the farmer's time to participate in the FFS session. Develop a checklist with the farmers to assess the quality of FFS session.

The next level of PM&E is to evaluate the improvement that occurs during one season of FFS. These methods mostly consider changes in knowledge and field skills between the beginning and the end of the FFS; changes assumed to have taken place as a result of the FFS.

The most important evaluation is the check on the impact of training. Farmers may improve their basic skills and knowledge, but this may not always lead to a change in field action or even to a desirable change such as changed goat management practices or improved economic returns.

Evaluation of the training impact is very difficult. One major problem is the time of impact. Does one season of change represent an impact? Or must the change or benefit occur for several years after the training to be considered a successful impact? There is no agreed conceptual framework for measuring impact. However, by considering the project goals in mind, the study should be designed by looking into the immediate and developmental impacts.

Introduce PM&E Concept

It is important to track whether the FFS is achieving its aims and to make corrections if necessary. This means including monitoring activities in the daily FFS activities. A game called 'Tug of war' can be used to introduce the concept of PM&E.

- **Materials**

  Long and strong rope
- **Time**

  Twenty minutes
- **Steps**
  - Split the participants into two equal-numbered groups
  - Place them at different ends of a long thick rope
  - Ask the groups to hold the rope and pull until one group is pulled over a line that is drawn in the middle
  - Ask both groups to evaluate why they have either won or lost the battle
  - Then the tug of war is done again.
  - The exercise is evaluated in a plenary session to discuss why one wins or loses and if there was any difference in the teams as a result of evaluating their performance in the tug of war. One can learn from this exercise that evaluation makes you realize what goes well and what does

not, and for what reasons. This helps to take corrective action and plans can be made for improvements.

Debriefing questions

1. Why did one group win?
2. What is the necessity to monitor and evaluate the FFS?

Before and After Picture

Pictures can be understood by all, including the illiterate, and can be used to visualize the types of changes in the area. Sketches (and maps) can be made at the beginning of the FFS season (for assessment and planning purposes), during the FFS (for monitoring purposes) and at the end of the FFS (for evaluation purposes) by the FFS participants in order to locate the changes and to analyze their causes and effects. Different items of interest can be included in the sketches and maps.

- **Objective**

To provide an example of how a map or sketch can be used to measure change. (The example given is to measure farmers' adoption of appropriate technologies in goat rearing)

- **Materials**

Flip charts, paper, markers of different colours, scissors, glue, local materials.

- **Time**

45 minutes per sketch

- **Steps**
  - Ask the subgroups to list the appropriate technologies to be used in goat rearing
  - Add missing technologies
  - Ask the subgroups to make a sketch of the technologies adopted by farmers before the start of FFS
  - Ask them to repeat the same exercise in the middle of the FFS

- Ask the subgroups to compare the two sketches. Ask them to analyze the new technologies learned and see if any are already being used. This process helps in monitoring the progress of FFS in terms of technology adoption.
- Ask the subgroups to make a sketch of the technologies adopted at the end of FFS or few months after graduation.
- Ask the subgroups to compare the first and last sketches. This will help to evaluate the use of technologies in the area because of FFS.
- By comparing the differences in the sketches/maps made at different times in the FFS season, we can see what has changed and thus 'witness' the adoption of new technologies.

The Evaluation Wheel

- **Objective**

  To assess the quality of FFS

- **Materials**

  Charts with an empty evaluation wheel drawn on (see illustration), markers of different colours.

- **Time**

  45 minutes

- **Steps**
  - Prepare the evaluation wheel in discussion with farmers on a chart in a way that each spoke in the wheel represents an indicator to evaluate the FFS sessions. For example, attendance, relevance of the content, performance of the facilitator, opportunity for learning, time management, methodology used, logistics etc.
  - The FFS group then decides on the score to be given to the indicator and chooses a location for the dot (the value marked with a pen or marker) to be placed on the spoke (close to the centre indicates negative, while close to the border is positive or a ranking of 1–5 can be applied).

- The FFS group then decides the score for each indicator and discusses the reasons behind the scoring.
- If a low score is recorded, solutions to improve the situation need to be sought collectively.
- The evaluation wheel should be repeated at the end of every session.
- Evaluation wheels can be compared week by week to monitor how the FFS is going and to assess the progress.

Evaluation of FFS

- **Objective**

  To assess the impact of FFS

- **Materials**

  Charts

- **Time**

  4 hours

- **Steps**
  - Prepare for the evaluation by discussing with the farmers, project staff and other stakeholders. Refer checklist given below.
  - Conduct focus group discussion with FFS farmers referring to the checklist
  - Rate each indicator on convenient scale and draw conclusions.
  - Share the results with the farmers, project staff, donors and other stakeholders.

EVALUATION FORM - CHECKLIST

Group profile

- Group membership: 20–25 farmers
- Common interest and fairly homogeneous group
- Group by-laws & constitution
- Gender, age and literacy mix
- Sustained attendance rates

FFS facilitator

- Trained in FFS methodology
- Trained in goat rearing
- Facilitating, not lecturing sessions
- Facilitator was always available and accessible for the farmers
- Creative and innovative
- Facilitator technically capable
- Resourceful with good attitude towards farmers' opinion and welfare
- Accountable to farmers

Group management and discipline

- Good time keeping
- About 80% attendance
- Learning and group norms-available and strictly followed
- All members understand group rules
- Transparency in financial management and decision-making
- Timetable of sessions followed
- Equal rights and mutual respect
- Roles of members, group representatives and facilitators well understood
- Democratic practices during selection of group representatives

Learning process

- Curriculum agreed on by farmers
- Curriculum fitted to real life situation
- Flexible curriculum
- Well-balanced group activities
- Timeliness of topics
- Should have a learning site including comparative studies GESA carried out regularly

Documentation

- Membership records
- Attendance-records/register well maintained
- Monitoring and Evaluation - documented
- Minutes/records of each session well maintained
- Photo documentation
- Preservation of visuals (Session charts, GESA charts, models)

Sustainability

- Group formed on SHG principles
- Clear objectives and goals of the group
- Ability to mobilize local resources
- Group cost sharing
- Linkages with other development agencies
- Adoption of Income Generating Activities (IGAs)
- Developed exit plan

Signs of empowerment

- Increased level of confidence in farmers
- Farmers' ownership of process
- Able to seek and share information (within and outside group)
- Farmers' understanding of FFS concepts and technical issues
- Active, motivated and confident members
- Active participation by all FFS members in decision-making process
- Sense of innovativeness
- Well informed decision making capacity

Outcome trends

- Improved and stabilized health of goats
- Improvement in the fodder availability
- Financial empowerment
- Adoption and adaptation of improved goat rearing practices by members

PART 3
FACILITATION GUIDELINES

1. How to ensure attendance and participation of members in FFS sessions throughout the year?

In FFS, farmers are involved in understanding various growth stages of an animal or a crop by analyzing the situation at different stages. Hence, it becomes very crucial to ensure the participation of farmers throughout the season. It has been a challenge for the facilitators to ensure the attendance of farmers throughout the season as the poor attendance affects the learning process. Following are the tips for the facilitators to improve the attendance.

- At the time of selection of participants, make sure that they are aware of the amount of time to be spent in the FFS.
- Plan the activities based on the local situation.
- Be flexible in time schedule to suit the farmers' needs.
- Make sure that the content of training is relevant.
- Include need based contingency topics
- Appreciate the views of farmers and provide space for their ideas.

2. Tips for adult learning through non-formal techniques especially to old and medium age group of men and women

Farmer Field School involves 'Doing Science with Farmers' in a simple way. This is a challenging task for any development professional. Non-formal education methods and approaches aid in effective facilitation as they enable farmers to observe, discuss, analyze and make decisions to solve their problems. They are very effective tools in FFS as they involve working with farmers who are semi-literate or illiterate. NFE should not be viewed as a separate area or field but seen as a core part of the FFS process.

In formal extension system the focus is more on transfer of technology. But, in Farmer Field School approach farmers are encouraged to get involved in science. When adult learners decide to participate in any learning activity, they bring along a wealth of

experience, knowledge, and skills. They are armed with their own beliefs, values and convictions. They have their own perceptions, biases and feelings. With such a background, the adult learner is a rich resource in the learning process. NFE methods and approaches encourage participants to see themselves as a source of information and knowledge about the real world. The learning process starts with the assumption that participants already possess some knowledge and do not start with a clean slate. In this approach, the synthesis of popular knowledge with existing scientific knowledge strengthens the learning experience of the participants.

NFE is a participatory educational process based on the following principles.

Principles of Adult Learning

- Learning is an experience, which occurs inside the learner and is activated by the facilitators
- Learning is the discovery of personal meaning and relevance of ideas
- Learning (behavioural change) is a consequence of experience
- Learning is a co-operative and collaborative process
- Learning is an evolutionary process
- Learning is sometimes a painful process
- One of the richest resources for learning is the learner himself
- The process of learning is emotional as well as intellectual
- The process of problem solving and learning is highly unique and individual

Non-Formal Education Approaches used in FFS

Key Non-Formal Education (NFE) approaches used in FFS learning include:

- Sharing
- Role play (dramatized sessions)
- Small group and large group discussion
- Brainstorming
- Field visits
- Study tours/exchange visits – Refer **page no. 13**
- Group dynamics – Refer **Annexure 3**

Sharing

Procedure: Knowledge, ideas and opinions on a particular subject are freely exchanged among participants and facilitators.

The method is suitable where the application of information is a matter of opinion. It is suitable when attitudes need to be induced or changed. Participants are most likely to change attitudes after discussion. The method is also suitable as a means of obtaining feedback about the way in which participants may apply the knowledge learned.

Role-play

Procedure: Participants enact, in the training situation, the role they will be called upon to play in their job. Use role-playing mainly for the practice of dealing with face-to-face situation, i.e., where people come together in the work situation.

This method is suitable where the subject is one that is a near-to-life practice to the training situation. The participants can practice and receive expert advice or criticism and opinions from fellow participants in a “protected” training situation. The participants get the feel of the real-life situation.

Small group and big group discussion

Procedure: Divide participants into small groups, giving each group a particular task to accomplish and discuss. Give every member of the small group the chance to share his /her ideas about the assigned task. Leaders that each of the groups chooses lead the discussions. After a certain given time, ask all groups to convene and process their discussion with the bigger group.

This method is suitable when eliciting participation and sharing of experiences as well as ideas from individual in-groups. It is easier for an individual to share his/her ideas with a small group than in a big group. This is true all the more when participants

are not comfortable with the big group. Sometimes, participants may feel intimated or threatened when asked to share their ideas with a big group. Thus, it becomes helpful to structure training in such a way that small group discussions precede large group work/discussions.

The ideal size for small group discussions is at least five and not more than ten members. Big group discussion should not exceed thirty members.

Points to watch:

Some members of the group may impose on others, i.e., insist on their ideas. There is also a danger that some participants may use up much time in presenting their opinions. These situations may lead to others not having the chance to speak. The facilitator should always be sensitive to these behaviours and be able to handle the group so that each member is given a chance to be heard. Accept all opinions to show respect for individual members. It might be helpful if the facilitator remembers that there are different kinds of people, they need to be encouraged to speak up or need recognition. It is his/her role to clarify inputs and tasks to avoid problems that may arise as a result of differences in personalities. Facilitators must maintain good judgment and not be swayed by opinions of any one of the group members.

Brainstorming

Procedure: Either in small groups or as a big group, give participants an issue or problem to be discussed about and deliberated on, exhaustively. Accept all ideas during the discussion. After a thorough deliberation on the issue or problem, the entire group comes up with a consensus as a final output.

The method is suitable when tackling issues and problems that need or call for group decision-making. It is particularly helpful when participants are expected to actively join in the deliberation and share their ideas, experiences as well as knowledge about the issue on hand.

Points to watch:

If the issue or problem is not clear to the group/s it is possible that participants will not be able to come up with what is expected of them. Discussions may move away from the topic.

3. Handy tips for facilitators - teaching, facilitating, mobilizing skills

Ten handy tips for facilitators

1. Grasp firmly

Have good knowledge over the subject matter being tackled. Catch the good point emerging during the discussion.

2. Be open

Encourage a conducive atmosphere for learning and sharing of ideas where everyone feels welcome and important.

3. Watch for point

Allow the discussion to get the right point and then try to stir the discussion into the main points of the activity.

4. Know your limits

Know your own limitations and those of the participants'. Have an idea of what is achievable and what is not.

5. Learn how to count

Be aware of how many participants are responding, how many are sleepy, how frequently they leave the room and how many are no longer listening.

6. Watch your wrist

Observe effective time management.

7. Have an artist's touch

Be creative. Creative techniques and approaches encourage participation.

8. Learn the traffic signals

As an effective facilitator, you must know when to stop, wait for a while and go.

9. Learn how to respect and appreciate

Remember to learn respect and ability to recognize everybody's contributions. Practice humility, as a facilitator you do not have the solutions. Some answers will come from the farmers or participants.

10. Recognize your strong and weak points

Always evaluate. Remember that there is no perfect score in facilitation. There is always room for improvement. Self-reflection will help in improvement.

4. What makes a good leader and a good and effective facilitator?

Leadership

Good FFS facilitator should have leadership qualities. Leadership is a learned behavioural skill, which includes the ability to help others achieve their potential as individual and as a team member.

Leadership is

- The talent to steer a group of people towards a certain goal
- The ability to guide and influence a group of people to achieve certain goals
- The art of guiding and directing a group of people towards achieving a certain goal
- The ability to influence the socio-economic behaviour of a group of people
- The art to mobilize and organize people to utilize available resources

Qualities of a good leader

- Accepts other people's opinions
- Flexible
- Inspires
- Good communication skill
- Innovative
- Good listener
- Good judgment
- Consults others
- Can influence others
- Foresighted
- Knowledgeable
- Trustworthy
- Committed, dedicated
- Honest
- Accepts criticism
- Patience
- Role model
- Able to set and achieve goals

Key Leadership Techniques

- Secure co-operation
- Use authority when required
- Direct communication
- Maintain discipline
- Develop group morale

Managing the participants during group discussion

In a group, there will be different types of participants like Silent, Dominant, Negative and Floating. For effective group discussion, facilitator should encourage all of them. Similarly, facilitator in FFS has to encourage and ensure participation of all and lead the discussion in a proper direction. The facilitator can observe different types of participants during group discussion/ activities and the facilitator has to manage each type of participants for better participation. The management strategies are as follows:

Dominant type: (may be the oldest, most experienced)

- I think most of us have understood your point clearly, would someone else care to contribute their observations?
- It looks as if we have covered that point in many discussions; let us now move to the next issue or topic.
- Would you mind if we got another opinion on this one? Several didn't get a chance to respond as yet.
- Could we talk about that at the break?

The silent type: (Young participants, women)

- Get him/her involved in activities, which require two people to share the work.
- Call their attention from time to time.
- Ask only easy questions.
- Talk to the person during the break to make him/her feel important or part of the group.

The Critical One: (mostly educated participants, political leaders)

Looks constantly for opportunities to disagree, to show up the other participants and trainer. While healthy disagreement is great, constant quibbling is annoying and disruptive.

- Let the group deal with him/her. “Anyone want to respond to that?”
- Avoid debate. If he/she insists after an exchange of views, simply say. “I understand your position”.
- Or you can say, we’ve given this issue considerable attention. We really should move on to something else.
- “I would like to discuss with you more about this after the break”.

The Floating type: (Somebody who wants to get attention or interested in the group discussion)

- “In what way is that related to the topic or previous point?”
- Allow him/her to talk but say “Let us turn to your comment when we discuss about…….”!

Roles and Duties of FFS Facilitator

- Guide in decision making
- Links with external facilitator and collaborators
- Technical backstopping
- Helps the group in achieving their objectives
- Helps in conflict management
- Initiates new FFS
- Should help with observations and analysis
- Should start from simple to complex endeavors
- Keeps discussion lively
- Avoid direct answering. Every question answered directly is an opportunity lost for learning
- Helps participants to reach an appropriate consensus
- Time management
- Show respect to all participants and their opinions
- Helps participants identify opportunities and potentials in their environment

Qualities of a good facilitator

- Good listener
- Respect others' opinions with open mind
- Cheerful
- Eye contact
- Well preparedness (Firm grasp of the subject)
- Well mannered
- Composed/confident
- Punctual
- Impartial
- Technical skills
- Communication skills
- Good questioning techniques (probing)
- Good observation skills
- Visualization skills

Working with farmers – a thought
Go to the people
Live among them
Learn from them
Plan with them
Start with what they know
Build on what they have
Not a showcase but a pattern
Not odds and evens but a system
Not piece meal but integrated approach
Not to confirm but to transfer

- Dr. Yen

5. How organizations could help their field level functionaries develop facilitation skills?

By getting their field level functionaries trained in season-long or short duration ToF on the major cropping system or farm enterprise that the organization is working upon.

Organizations should understand that the investment on their field functionaries is a long term objective, which in a sense doesn't limit its scope to developing facilitation skills among the field functionaries but extends to imbibing organizational culture and value systems in them. Therefore, selection of an employee for a ToF/ SToF is a carefully carried out management function and shall precede induction of the functionary into the organizational environment, particularly when the functionary is new to the organization. This apart, the organization should bear in mind developing field functionaries into effective facilitators will also have implications on formulation of staff policies as the organizational investments are likely to bear fruits slowly and for a long time. Another important point for the organization's consideration is that the

development of facilitators is not a one-time affair. The functionary has to undergo at least one ToF/ SToF followed by an opportunity to conduct at least one season-long FFS before one really graduates as effective facilitator. From there on every other opportunity to participate or organize a ToF/ SToF and or season-long FFS keeps offering new learning opportunities. Thus, the facilitators will be in a constant learning mode and hence should be treated as organizational assets worth nurturing. Initial skill training, opportunities for repeated practice, encouragement to use creativity and imagination, recognition and rewards on occasions of every small and big accomplishment, together go a long way in developing skills in the field functionaries.

PART 4

TECHNICAL SESSION GUIDELINES AND SPECIAL TOPICS

1. General management practices

Desirable features for selection of goats

Objective

At the end of the session farmers will identify the desirable features of Buck and Doe

Materials

Goat herd, charts, markers

Time

Two hours

Steps

Selection of buck

- Ask participants to list desirable features of breeding buck based on their experience and knowledge.
- Add additional desirable qualities of breeding buck with consensus from the group (Refer the checklist).
- After discussion, ask the subgroups to choose buck from the farmers' flocks.
- Based on observation of the selected buck, ask the subgroups to draw the buck on a chart and depict the desirable features present. Mention the missing features with a different colour.
- Discuss the availability of good bucks in the region and strategies to introduce into the village.

Desirable features of a breeding buck

Should have pure breed characteristics
Minimum of 15 months of age should be used for breeding purpose
Buck should be heaviest goat in the flock with a wide chest.
Have a straight healthy body, strong leg with masculine look.
Free from any defects like twisted legs, overshot or undershot jaws.
Aggressive in nature
Possessing a rugged mane on the neck and shoulders to reflect breeding ability.
Both the testicles should be tight and of equal size
Good record of pedigree
Suitability to agro-climatic conditions

Selection of doe

- Follow the same procedure to identify the features of a good doe.

Desirable features of a doe

- Should possess pure breed qualities
- Head: long, lean with lively expression
- Neck: long, lean, silky skinned
- Back: strong, straight, muscular
- Ribs: deep, wide sprung
- Hips: broad, bones - wide apart, hollow in front of hips
- Rumps: long, gently sloping
- Udder: capacious, broadly based, elastic skin, big milk veins
- Teats: hard, distinctly sized, thick
- Hocks: sufficiently straight, wide apart providing enough space to udder
- Legs: strong, straight forelegs
- Jaws: long, powerful
- Barrel: large good hereditary record (kidding capacity of predecessor)
- Good record of pedigree
- Suitability to agro-climatic conditions

Debriefing

Mention the desirable features of breeding buck and doe.

2. Identification of characteristics of local breeds

Objective

At the end of the session participants will be able to identify the characteristics of local breeds (Sirohi and/or Marwari)

Materials

Goat herd, charts, markers

Time

1 hour

Steps

- Ask participants to list the existing breeds in the village
- Discuss the distinct characteristics of Sirohi/Marwari breeds in large group
- Ask the subgroups to identify breed characteristics in the flock
- Each subgroup explains the characteristics of particular breed in the large group
- Discuss ways to conserve and improve the genetic purity in breeds
- Facilitate to arrive at breed improvement plan by the farmers

Debriefing

What are the characteristic features of Sirohi/Marwari/Jamnapari breed?

3. Management of goat herds, breeding buck and doe

Objective

At the end of the session farmers will

- Discuss the management practices for breeding buck and doe.
- Plan to establish studies to know the effect of good management practices on the performance of buck and doe.

Characteristics features of Sirohi breed

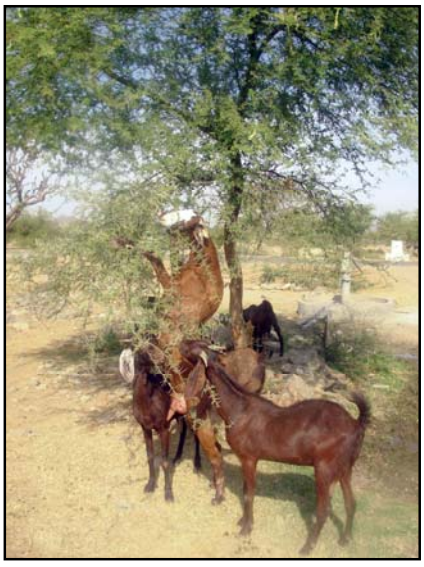
- Compact and medium sized animal
- Thin and small skin
- Small ears and stunted horns with bay or chestnut as dominant colours, some times completely white
- Location: Central and southern Rajasthan

Characteristics of feature Marwari breed

- Medium sized with small muzzle
- Jet-black colour with white or speckled ears
- Long corkscrew horn
- Location: Western Rajasthan

Materials

Goat herd, charts, markers



Time

Two hours

Steps

Managing goat herd

- Discuss the general management practices. Highlight the importance of following practices

- Selecting an appropriate breed in relation to farmer's production needs and availability of resources
- Adjusting the size of flock according to available resources
- Providing suitable housing and clean surroundings
- Correct feeding
- Providing clean and sufficient water
- Growing own fodder
- Collectively managing common resources (common lands, water, forests)
- Applying good breeding practices
- Hygienic and economic kid rearing
- Isolating sick animals from the rest of the flock
- Providing safe first-aid to sick animals
- Regular preventive practices such as deworming and vaccinations

Suggested good management practices for buck

- Bucks should be housed separately to have enough movement and exercise. A single stall measuring 2.5m X 2m with usual fittings for food and fodder is suitable for the buck.
- Two bucks should not be kept together, particularly during breeding season because they may fight causing injury to each other.
- Bucks should be taken to does for breeding only when needed.
- Ensure proper nutrition for bucks especially during breeding season. Good pasture along with enough salt, minerals and vitamins will maintain them healthy. Average green fodder requirement per buck per day is 7-8 kg.
- Carryout grooming or brushing everyday to keep them clean and free of parasites.
- Buck may be used for mating when attains maturity at about 15 months age.
- Buck of 18-24 months age may be used to serve 25-30 does and when attains full maturity at 2-2 ½ years age may be allowed to serve 50-60 does in breeding season.
- Breeding buck when cared well and fed properly keeps fit for breeding purpose till 8-10 years.
- Buck should not be allowed to serve a doe more than once.
- Buck is sexually more active in winter and spring.
- Periodical trimming of hoofs to prevent lameness
- Drenching with vermifuge be carried out to keep them free of parasites

Management of buck

- Ask the subgroups to work on the following questions.
  - List the current management practices of breeding buck prevailing in the village
  - What other management practices could be done to improve the performance of the buck?

- Back in the plenary, subgroups present the outcomes and deliberate
- Facilitator may offer suggestions
- Arrive at good management practices for buck upon consensus
- Discuss the details of a study to know the effect of good management practices compared to existing practice on bucks (decide on farmer/s, number of bucks, observations, timeline, etc).

Follow up: Establish the study as per the plan.

Management of doe

- Follow the same procedure to come out with the management practices for doe.

Suggested good management practices for doe

- Doe attains sexual maturity between 15-18 months age
- Oestrus cycle is of 19 days and duration of oestrus is 36 hours
- Time of mating is 10 – 12 hours after first symptoms of heat and a second service again after 10 hours, if heat continues
- Most does come in heat in September and March
- Two kidding peaks in goats are January-April and September-November. Kids borne during January - April grow better than those borne during September-November, suggesting that August – November mating is better
- Bringing the teaser buck near the females for a short time every morning is generally helpful in picking up those in silent heat or shy breeders

4. Care of pregnant doe

- The gestation period is of 145-150 days.
- About 6-8 weeks before kidding the doe should be dried off for developing healthy kid.
- Feed laxative, leguminous and nutritious ration along with 450g concentrates daily.
- If they are permitted go on range then separate pasture be used for these does.

- Avoid overfeeding and underfeeding to prevent metabolic disorders. Unduly thin goat prior to kidding is likely to have kidding problems leading to birth of weak kids whereas over fat goats are likely to have increased incidences of difficult kiddings.
- Avoid sudden changes in ration of does
- Provide ration with enough protein and minerals as per requirements according to body weight and stage of pregnancy.
- Water be made available at all times.
- House the pregnant doe in separate pen to avoid accidents, injuries from other animals and also to give better care.
- Make provision of clean soft bedding material in maternity pens for pregnant goats in the last 15 days of gestation.
- Reduce the concentrate mixture for goat @ 100g/day in the last week of gestation before kidding.

Care of doe after kidding

- Clean the place of kidding, disinfect and dispose off the placenta.
- Wash the hindquarters of goat with antiseptic solution.
- Protect the doe against inclement weather, especially cold.
- Give a warm bran mash containing a small amount of oatmeal, ginger, pinch of salt, mineral mixture and jaggary.
- Concentrate quantity should not be more than 500g/day.
- Doe may return to heat after about a month but breed only 40 days after kidding.

Debriefing: Mention the management practices of breeding buck and doe.

5. Housing for goats

Objectives

At the end of the session participants will be able to discuss

- The need for proper housing for goats.
- Different housing systems to suite under different conditions.

Materials

Charts, markers

Time

2 hour

Better housing systems

In the very hot and semi-arid areas, goats are usually housed in the open, as it is too hot to keep them indoors. During the day, when the sunrays are intense they are rested under a tree and at night they are penned within areas which are fenced off by thorny bushes.

Steps

- Elicit the existing housing system for goats, and discuss advantages and disadvantages.
- Discuss the need for proper housing (like better aeration, maintaining hygiene condition, safety against adverse climate, sufficient resting space)
- Introduce better housing systems

Designing a good shelter

- It should protect animals from bad weather and predators.
- It should be easy to clean.
- It should be of appropriate size so animals are comfortable (1-2 sq.m/adult goat, 0.4 sq.m/kid).
- It should be built of materials that are locally available, inexpensive and appropriate to the area.
- It should be adequately lit and ventilated.
- It should have space for comfortable handling of animal.
- It should have space for milking.
- It should have place where animals can be fed and watered easily.

Hygiene and safety checklist

- Clean the shed twice a day. Remove the wastes and use it in a compost pit or a gobar gas plant.
- Disinfect the shed once a week by sprinkling a dilute solution of limewater, washing soda or smear cow dung on the walls and floor.
- Regular upkeep of the shed is vital: potholes and pits in the floor should be filled with fresh mud/gravel/sand; otherwise water collects in them. Animals can stumble and trip in these holes and get injured.

- Some trees are believed to repel insects and could be planted near the animal shed.

- **Plan for the establishment of better housing systems with interested farmers.**

Debriefing: What are the disadvantages of existing housing system? How to design a good shelter?

6. Reproduction

Overcoming inbreeding
- Introducing new buck
- Exchange of bucks among the farmers of the same village and surrounding villages
- Castration of non breeding bucks

Inbreeding

Objective

By the end of the session participants will be able to

- State the ill effects of inbreeding
- Discuss ways to overcome the inbreeding

Time required

One hour

Materials

Goat herd, charts, markers

Steps

- Discuss the reasons for low productivity in goats
- Focus on inbreeding and discuss the effects of inbreeding on productivity
- Discuss the reasons for inbreeding
- Discuss the ways to overcome the inbreeding
- Plan to initiate the study on inbreeding

Debriefing

- What are the ill effects of inbreeding and ways to overcome?

Identification of heat symptoms

Objective

At the end of the session farmers will be able to discuss and identify the symptoms of heat in goats

Materials

Goats herd, charts, markers

Time

45 minutes

Steps

- Discuss the importance of knowing the heat symptoms in goat.

Heat symptoms in goat

- Redness and swelling of vulva.
- Frequent wagging of tail.
- Loss of appetite and reduced feed intake.
- Sudden drop in milk yield.
- Frequent urination.
- Excited behaviour of doe.
- Mucous thread from vulva.
- Frequent bleating.
- Mounting on other does in flock.
- Heat season: April-May and Nov-Dec

- Give a group activity to list the heat symptoms and breeding seasons.
- Discuss the outcomes in large group.
- Add additional symptoms by discussing with farmers
- Ask the participants to go round the flock and identify the goats in heat
- Discuss the measures to be taken during heat period

Debriefing

State the heat symptoms

Pregnancy diagnosis

Objective

At the end of the session farmers will be able to determine the pregnancy in goat

Materials

Goats, goat urine, 5 ml Barium Chloride (1%) per goat, test tube or any transparent apparatus of about 25 ml capacity

Time

45 minutes

Steps

- Ask how farmers commonly diagnose the pregnancy in goats.
- Introduce the pregnancy diagnosis method, if not known.
    - Collect about 5 ml urine of a goat suspected to be pregnant in a test tube or transparent apparatus
    - Add 5 ml Barium Chloride (1%) solution and mix
    - If turbidity due to precipitation is noticed, it means goat is pregnant. If the solution is clear, it indicates no pregnancy.
- Ask the participants in subgroups to collect the urine of goats suspected to be pregnant and test by above method. Provide an opportunity to validate local methods.
- After obtaining the results, discuss the utility of the diagnostic methods in the plenary.

Debriefing

State the goat pregnancy diagnostic method.

7. Care and management of kids

Objective

At the end of the session farmers will come out with care and management practices of kids

Materials

Goat kids, charts, markers

Time

1 ½ to 2 hours

Steps

- Discuss the prevailing practices for management of kids

Suggested good management practices for kids

- Cleaning mucus: nostrils and body of kids is to be cleaned by means of soft cloth just after kidding. This prevents the kids from catching cold and pneumonia. It also clears the breathing passage.
- Cutting naval cord: Cut 2.5 cm away from the body and then dip into 7 % iodine solution for disinfection.
- Feeding colostrums: Allow kids to suckle the first milk (colostrums) within one hour after birth. It provides antibodies to kids for immunity against infection. It is a good source of vitamin 'A' and 'D' and minerals like copper, iron, manganese, magnesium, etc.
- Feeding milk: Feeding whole milk to kids two times a day.
- Disbudding: Under group management in loose housing system horns of goats are nuisance. The disbudding helps in safe handling of bucks, prevents injuries to other animals and prevents goat smell by removing musk glands at the base of horns. Age of disbudding in male kid is 4-5 days and female kid is 10-12 days.

- Facilitator may offer suggestions
- Arrive at good management practices for kids upon consensus

Procedure

Hairs around the horn buds are clipped and this area covers with Vaseline to protect from burning when caustic soda is used. Rub the caustic potash stick on the horn bud to cauterize it and put some dusting powder (ZnO). Electric dehorner can also be used at 539 degrees for 8 seconds.

Precaution: Use hand gloves to protect skin when caustic soda is used. Protect the eyes of kids from contact of caustic soda.

- Castration of male kids
- Deworming of kids: Kids are more susceptible to endoparasites than adult animals, therefore a regular deworming is necessary
- Discuss to initiate the studies with interested farmers.

Debriefing

What are the new management practices you have learnt in managing kids?

8. Health and Maintenance

Deworming

Objectives

At the end of the session participants will be able to

- Practice the deworming in kids and adults
- Arrive at deworming schedule for their flock.

Materials

Goats, deworming medicine

Time

2 hours

Steps

- Ask the participants whether they are practicing deworming, if yes what practices they are following.
- Discuss additional information on deworming, if the existing practices are not satisfactory.

Deworming schedule

Kids are more susceptible, hence proper management practices are to be followed. Use the following information for scheduling deworming in kids

Age	Drug	Dose
10 days	Binminth	½ tablet
30 days	Piperazine	5g in two days
45 days	Binminth	1 tablet
60 days	Phenovis	5g in two days

- Ensure that feed and water given to kids are free from parasites.
- Time of deworming: Once before and once after rainy season.
- For coccidiosis use of Amprosol is good, while for roundworms Nilworm is better.
- For adults, regular drenching of deworming in January, April, July and October.
- Allow the participants to practice deworming. Seek doctor's help in case facilitator is not confident.
- Discuss the procedure to be followed by the farmers to get the services from veterinary hospitals for deworming.
- Initiate a discussion to arrange deworming campaign in the village. See that farmers' take the responsibility to arrange the campaign.

Debriefing

State the importance of deworming and deworming schedule.

Vaccination

Objectives

At the end of the session participants will be able to

- Practice vaccination in goats
- Arrive at vaccination schedule for their flock

Materials

Goats, vaccines,

Time

2 hour

Steps

- Discuss the purpose of vaccination.
- Ask the participants whether they are practicing vaccination, if yes, for which diseases, period, name of the vaccine, dose. Also ask whether they are effective.
- If the existing practices are not satisfactory, discuss the following information for scheduling vaccination.

Vaccination schedule

For kids

Age	**Medicine**	**Method**
At birth	Sulphur 200	1-2 big pills crushed into powder and placed on tongue
7-10 days	Andrographis Paniculata	Drench 10 ml
30 days	Repeat Sulphur 200	1-2 big pills crushed into powder and placed on tongue
1-6 months	Calcarea Phos 12	4-5 pills orally. Repeat every month. It also acts as growth promoter.
3 months	Calcarea carb 200	5 pills orally
3 months and 10 days	FMD vaccine	1 ml
6 months	ET vaccine	2.5 ml

For adults

April- HS (Haemorrhagic septicaemia**)**

May- ET (Enterotoxemia)

PPR-Peste Des Petits Ruminants

Some important tips on vaccination

- Always deworm animals prior to vaccinating. This reduces the post vaccination stress in animals
- Avoid vaccinating pregnant animals during the last three months of pregnancy

- Avoid vaccinating sick animals or animals already sick with the particular disease for which the animal is being vaccinated
- In emergency outbreaks, first vaccinate the animals in unaffected neighboring villages/flocks before vaccinating those in the village/flock where the disease has already struck
- Boil and sterilize the needle before vaccinating animals
- Avoid using the same needle on all animals. If you want to use the same needle, sterilize the needle thoroughly before its reuse
- Note the date and batch number and avoid using the vaccine if the expiry date is over
- It takes three weeks for immunity to set in after vaccinations, and animals will not develop immunity to the disease immediately. If the vaccinated animal dies prior to three weeks due to the said disease against which it was vaccinated, it is probably because it had insufficient time for it to have developed immunity.

FMD

The disease is caused by a virus. It spreads through air and contact. Human beings also act as carriers. It usually occurs twice a year; between February and April and again between August and October. Occurs more often in seasonal changes mainly during the onset of summer, as there is a shortage of fodder and animals are weak and susceptible. It can also occur during any change in season.

Symptoms

- Blisters on foot, mouth, udder, nose, muzzle.
- Lameness as there are wounds in the hooves and they get infected with maggots.
- Blisters in the mouth, gum, tongue and entire digestive tract causing excessive salivation and inability to eat.
- Anorexia.
- Reduction in milk yield.
- Weakness and loss of weight.
- Fever.
- Watering from nose.
- Abortions.
- After contracting the disease animals are very weak, suffer from anaemia and some have difficulty in breathing. These animals are unable to withstand heat for long period.

- Vaccinated animals might also contract the disease if:
  - Their immunity is low
  - The vaccine is ineffective (administered after expiry date, not stored properly, etc)
  - If the vaccine is not administered in sufficient quantities

- Vaccinate as per the seasonal calendar of prevention
- For bacterial vaccines (HS), administer for the first time after six months of age. Thereafter, once every year. These do not need to be refrigerated.
- Viral vaccines (FMD, PPR) have to be maintained at correct temperature of 2-4^{0}C before use. The vaccine should not be frozen. After removing the vaccine from cold storage try and use it within 12 hours. Animals above four months of age should be vaccinated with FMD vaccine. Repeat after four weeks. Thereafter, repeat once in six months.

- Allow the participants to practice Vaccination. Seek doctor's help in case facilitator is not confident.
- Discuss the procedure to be followed by the farmers to get services from veterinary hospitals for vaccination.
- Initiate a discussion to arrange vaccination campaign in the village. See that farmers' take responsibility to arrange the campaign.

Debriefing

State the importance of vaccination and schedule.

Identification and management of FMD disease in goats

Objectives

At the end of the session participants will be able to

- Identify the symptoms of FMD disease
- Arrive at possible management practices.

Materials

FMD Diseased Goats

Time

2 hours

Steps

- Ask the participants which are the commonly diseases seen in goats.
- Ask the participants whether they can identify FMD disease in goats. If yes, ask how.

- Discuss about the FMD disease by observing a diseased one. See box: FMD
- Discuss the reasons for outbreak of FMD.
- Ask the participants what remedies they are following to manage the disease and their effectiveness.
- Discuss the management practices to control the FMD disease

Management of FMD

Prevention

- Vaccination against the disease should be carried before its onset in the region. Vaccination should be done twice a year; in February and then again after six months in August. Alternatively vaccinate about a month prior to the onset of disease in the region, as per the seasonal occurrence.
- Lime powder should be sprinkled around the cattle shed.
- The affected animal should be separated immediately from the healthy flock.
- As humans are carriers, wash hands thoroughly after being in contact with infected animal before you attend healthy animals.

First aid

- Treat for fever.
- Treat the wounds in mouth, hooves and maggots.

Diet

- Feed leaves of Sesbania grandiflora, Azadiracta compositae.
- Grind a handful of coriander leaves and feed the goat.
- Feed toddy early morning about ½ to 1 litre.

- Discuss and plan to establish studies to know the impact of management practices on disease management. Seek doctor's help in case facilitator is not confident.

Debriefing

What are the symptoms and management practices of FMD disease?

Note: Identification and management of different diseases in goats

Follow the same procedure as discussed above with modifications, if necessary. Use the following information for facilitating the sessions.

Contagious Caprine Pleural Pneumonia (CCPP)

Caused by bacteria and occurs in hot and humid climate helps the spread of disease. This disease is also seen in sheep.

Symptoms:

- High rise in temperature, extreme depression, drop in milk yield and anorexia.
- Dry painful cough
- Arched back
- Extended head and neck
- Dilated nostrils
- Panting
- Abdominal respiration
- Expiratory grunt
- Drooling of saliva
- Nasal discharge

Prevention:

- Maintain hygienic conditions in the shed
- House animals in a well ventilated room
- Prevent overcrowding of animals

Treatment

- Refer to nearest veterinary dispensary. Use treatments given for pneumonia as first aid.
- Isolate the infected animal from the rest of the flock.

Contagious Ecthyma / Sore mouth

Caused by virus. Virus possibly enters through wounds in the mouth while grazing. Spreads through contact with infected animals. The disease occurs in goats and sheep especially below two years. It can occur anytime of the year.

Symptoms:

- Fever
- Anorexia
- Dullness, depression, loss of appetite and rise in temperature
- Profuse salivation, tears with pus-filled nasal discharge
- Scabs around the nose and mouth
- Due to wounds and scabs animal cannot open its mouth
- Nodular eruptions are found on the oral commissaries (lips, mouth and nostrils)
- Lesions followed by formation of scales after a week
- Itching on the mouth, and animal keeps rubbing face against trees and sticks
- Bleeding from wounds
- Lameness
- Difficulty in breathing
- Weakness and weight loss

Prevention:

- Avoid contact with infected animals, give animals clean drinking water. Humans handling these animals should clean their hands with soap.

Treatment:

- Clean affected area with lukewarm water mixed with either potassium permanganate or Echinacea,
- Himax ointment (Ayurvedic), or
- Saframycin ointment to control secondary bacterial infection.

Peste Des Petis Ruminants (PPR)

Caused by virus - PPR. Occurs during onset of rainy season.

Symptoms:

- High fever
- Anorexia
- Depressed and sleepy

- Watery discharges from eyes, nose and mouth, later becomes thick and yellow discharge.
- Disturbed breathing and cough
- Foul-smelling and diarrhea
- In later stages, formation of nodular lesions in the skin, on outside of lips and around muzzle.
- Pregnant animals may abort
- Death
- Conjunctive red

Prevention:

- Vaccination
- Isolation of infected animals

Treatment:

- Give first aid for fever, diarrhea and immediately contact nearest veterinary doctor

Goat pox/Sheep pox

It is caused by a virus and occurs in goat and sheep in summer.

Symptoms:

- Fever
- Pox like marks over face, skin, udder, etc.
- Lesions inside mouth and digestive tract makes it difficult for animal to eat.
- Watering from mouth, eyes and nose
- Lesions in lung lead to pneumonia, especially in sheep.
- Eyes swollen with pus
- Difficult breathing

Prevention:

- Sheep should be vaccinated in February. There is no goat pox vaccine produced in India.

Treatment:

Apply powdered black pepper to the vesicles or Himax or Neem oil on the pox lesions

9. Feed and fodder

Feed management in goats

Objectives

At the end of the session participants will be able to decide on the feeding management practices in goats

Materials

Charts, markers

Time

2 hour

Steps

- Initiate discussion by discussing the importance of having good feeding system
- Ask the participants how they are feeding the goats
- Discuss the following feed management practices
    - Immediately after birth, kids must receive colostrums and thereafter kids up to 2 months must be fed @1/10th of their body weight.
    - The kids from 2 to 4 months of age should get creep feed @450g everyday along with green grass, water etc.
    - More than four months old goats should be given concentrate mixture @ 450g.
    - The milking doe should be provided concentrate mixture @350g for each litre of milk.
    - For breeding season, the buck should be given concentrate mixture @ 400g daily with green pasture.
    - To produce more milk and high quality meat, the goats should be provided with leguminous fodders and concentrate mixture in their diet.

Debriefing

Mention important feed management practices in goats.

Homemade feed concentrate for goats

Objectives

At the end of the session participants will be able to

- Prepare the concentrate by using locally available materials
- Workout the economics of homemade concentrate and readily available concentrates

Materials

Charts, markers, cluster bean 14 kg, mustard/taramira/sesamum cake 8 kg, wheat bran / rice bran62 kg, bajra/jowar/maize 12 kg, jaggary 2 kg, mineral mixture 1 kg, salt 1 kg

Time

2 hours

Steps

- Ask the participants whether they are using concentrate feed for their goats.
- Discuss the importance of concentrate feed.
- Discuss the cost of concentrate feed available in the market and the expenditure incurred per year per goat.
- Discuss the alternatives to concentrate feed available in the market.
- Discuss the procedure involved in preparing homemade concentrate feed.

Procedure

Grind cluster bean, bajra / jowar/ maize separately.

Grind mustard / sesamum / taramira cake and jiggery into pieces separately.

Mix the ground cluster bean, bajra / jowar / maize, mustard / sesamum / taramira cake, jiggery and wheat / rice bran well.

Add mineral mixture and salt and mix well.

Store the concentrate feed in airtight bags.

- Ask the subgroups to practice the preparation of homemade feed concentrate.
- Compare the cost of homemade concentrate feed and commercially available concentrate feed.

- Plan to initiate the studies to know the effect of homemade feed concentrate on the growth and development of goats.

Debriefing

How to prepare 50 kg homemade feed concentrate?

Azolla production

Objective

By the end of the study participants will be able to establish Azolla production unit.

Time

2 hours

Materials

Spade, pick axe, polythene sheet, piece of jute cloth/bag, fertile soil, fresh cow dung, bucket, water and Azolla culture

Steps

- Discuss the role of green fodder and concentrates in improving the health of goats
- Discuss the possible strategies farmers can employ to maintain the health in the absence of green fodder
- Introduce Azolla and its importance as a feed. The constituents of Azolla: Proteins- 24–26%, Fibre- 9%, Fat- 5%, Carbohydrates- 5%, Nitrogen- 4–6% and Minerals- 1–2%
- Ask the subgroups to establish Azolla unit by following steps mentioned below:
    - Dig a pit of size 8 ft length, 4 ft width and ½ feet depth.
    - Level the pit at bottom by removing pebbles, roots
    - Spread a plastic sheet of thickness 150GSM of size 10 ft length, 6 ft width
    - Spread 20–25 kg of sieved fertile soil on the plastic sheet uniformly to a height of 1 inch.

- Take 4–5 kg of dung, 100 gm of super phosphate, 40 gm of mineral mixture (if available) and mix with 15–20 liters of water and make into slurry. Spread this slurry on the soil uniformly.
- Add sufficient quantity of water to maintain water depth at 4–5 inches
- Remove any floating materials on the water surface
- Release about 500 grams of Azolla culture into the pit and provide partial shade
- Cover pit with net (mosquito net) to avoid litter
- Azolla grows very quickly and spreads in the entire pit within 7–10 days. Azolla is ready for harvest after 7th day. Everyday about 1 kg of Azolla can be harvested.
- Slurry of 1kg cow dung + 20gm of mineral mixture+ 5 liters of water can be added to the pit at fortnightly interval.
- Once in every three months re-establish the unit.

- Discuss the precautions to be taken for Azolla production.

Precautions

- Azolla should not be exposed to direct sunlight and overshadowed areas.
- If Azolla is raised under the trees, the pit should be covered with plastic mosquito net to avoid leaves falling into it because Azolla gets decayed along with the fallen leaves.
- At least 2 inches water level should be maintained in the pit.
- The water should be changed at least once in a month and 5 kg new soil should be added at least once in two months.
- Once in six months the entire soil and water need to be changed (Reestablishment).
- Remove any diseased or decayed Azolla.

How to use Azolla as feed

As Azolla is grown in the pit containing dung slurry, goat won't prefer if it is directly fed. Before feeding it to goat, wash Azolla with clean water for 2-3 times and then mix with concentrated feed or wheat husk. Few days later, goat gets habituated and then it can directly feed. Conduct 'Stop and Go' study to know the effect of Azolla on milk yield.

- Discuss the method of using Azolla as goat feed

Debriefing

1. What are the critical steps in establishment of Azolla?
2. What are the factors that help in getting optimum yield of Azolla?

Silage making

Objective

By the end of the study participants will practice silage making

Time

2 hours

Materials

100 kg green fodder (bajra /jowar/maize), 1 kg jaggary, ½ kg salt, ¾ kg mineral mixture, plastic bags / barrels, 10 litres of water, bucket, chaff cutter

Steps

- Initiate discussion by asking the farmers 'are there any ways one can preserve the green fodder, which can be used in summer'.
- Introduce ‘Silage’, as a feed preserved by natural fermentation in conditions where flow of air through the heaped material and contact with water is eliminated. Legumes are mixed with cereal forages or grasses.
- Ask the subgroups to prepare silage by following steps:
    - Cut 100 kg green fodder into small pieces using chaff cutter.
    - Take 10 litres of water in a bucket and add 1 kg jaggary, ½ kg salt, ¾ kg mineral mixture. Stir well to dissolve all the materials.
    - Take a plastic bag or barrel and put about 15 cm layer of chopped material. Sprinkle a solution prepared before.
    - Make it compact by trampling.
    - Repeat the same procedure till the materials are completely exhausted. More polythene bags or barrels can be used.
    - Finally tie the polythene bag tightly after proper trampling to make it airtight.
    - Silage will be ready in about 45 days.

- Discuss and plan to establish a study to know the effect of silage on the goat health. Initially feed goats with less quantity of silage and gradually it can be increased up to 1 kg/day/goat.

Debriefing

What are the steps involved in preparation of silage?

'Stop and Go' method of experimentation

Objective

By the end of the study participants will be able to assess the effect of concentrate feed on milk yield

Time required

30 minutes

Materials required

Goat in early lactation, concentrate feed, measuring jar

Steps

In the large group, discuss on how the effect of a positive treatment like feeding the concentrate can be studied, introduce the 'stop and go' method of studying the effect

- Record the milk production for a week before starting the concentrates.
- Feed the concentrates for one week and record milk production.
- Stop feeding concentrates for next one week and continue recording milk production.
- Resume feeding with concentrates for another week repeating the above procedure.
- Analyze the data and draw the conclusions.
- Use the same procedure to study the effect of feeding azolla, silage and leguminous fodder.

Debriefing

How would you conduct 'stop and go' study?

10. Marketing

Better marketing for goats

Objective

By the end of the session participants will be able to

- Discuss the malpractices in goat's marketing
- Develop marketing strategies

Time required

Two hours

Materials

Charts, markers

Steps

- Elicit information on existing goat marketing system
- Discuss on the common mistakes that farmers commit during marketing (like unplanned sale, distress sale, selling through middlemen, blind beliefs, not selling at right age, selling individually),
- Discuss and list the malpractices by the traders/middlemen. Encourage the farmers to share their experiences (like less price, delayed payments, not based on weight, higher commission rate, etc.)
- Develop marketing strategies (consider farmer mistakes and malpractices by traders/middlemen)
- Plan to operationalize the marketing strategies.

Debriefing

- What are the strategies developed to get fair price for the goats?

Estimating the age of the goat

Objective

By the end of the session participants will be able to estimate the age of goat.

Time required

45 minutes

Materials

Goat herd

Steps

- Ask the participants how one can know the age of the goat.
- Discuss the importance of knowing the age of the animal.
- Discuss how to determine age by counting the teeth using the following information

Teeth	**Age**
8 temporary incisors	Birth-1 month
1st pair of incisors	1-1.5 years
2nd pair of incisors	3 years
3rd pair of incisors	4 years
4th pair of incisors	5 years

- Ask the participants to practice the method.

Debriefing

- How to estimate the age of the goats?

BIBLIOGRAPHY

Gallagher, K.D. 1999, Farmers Field Schools (FFS): A group extension process based on adult non-formal education methods. Global IPM Facility. Retrieved Sept. 17, 2008 from http://www.farmerfieldschool.net/document_en/FFS_GUIDe.doc

Godrick Khisa 2004, Farmer Field School Methodology- Training of Trainers manual, FAO, Kenya

Groeneweg, K., Buyu, G., Romney, D. and Minjauw, B. 2006, Livestock Farmer Field Schools– Guidelines for Facilitation and Technical Manual. International Livestock Research Centre: Nairobi, Kenya.

Naganagouda, M. and Ravindranath Reddy, 2008, Farmer Field Schools in Dry Farming – A Guidebook, AME Foundation, Bangalore.

Process document on Training of Trainers (ToT on IPM in Vegetables) 2005, Muthyalapadu: FAO, India

Ramdas, S. R. and Ghotge, N. S., 2005, Bank on hooves, Vol. 1-2, Anthra Publications, Hyderabad.

Van de Fliert, E. and Braun, A.R. 2000, Farmer Field School for integrated crop management of sweet potato: Field guide and technical manual. International Potato Centre–User's perspective with agricultural research and development, Los Baños, Laguna, Philippines.

ANNEXURE 1

BASELINE SURVEY – GOAT FARMING PRACTICES

1. Name of the farmer:
2. Name of the village:
3. Age/Sex:
4. Caste:
5. Education:
6. Land holding (Bhiga): Dry: Irrigated:

   Source of irrigation
7. Crops grown:
8. Number of animal holdings: Cow ( ) Buffalo ( )

   Sheep ( ) Goat ( )
9. Milk yield/day:

Cow	Buffalo	Goat

10. Consumption and sale of milk:

	Household consumption	Local sale	Cooperative societies
Cow			
Buffalo			
Goat			

11. Do you prepare milk by-products? If yes, what and quantity?
12. Goat:
    a. Male-female ratio:
    b. Number of kids in each kidding:
13. Sale of goats (tick the appropriate):

Local sales	Mela (Date)	Local market

14. Manure collection per day (in kg) / flock (Mention the flock size):
15. Do they make compost / vermicompost?

16. Weight recorded

Age	Male		Female		Remarks
	Highest	Lowest	Highest	Lowest	
Birth weight					
0-6 months					
6-12 months					
12-24 months					
24 months & above					

17. Do you practice fattening of animals? If yes, what practices are followed?

18. Castration: Yes / No, If yes,

    i) Age of castration:

    ii) Method of castration:

19. Grazing timings: from_____ hrs to _____ hrs

20. Fodder dependence:

    a. List of trees

    b. List of other fodder species

    c. Quantity of fodder fed to each goat/day:

21. Feeding of Concentrates:

    a. What are the ingredients?

    b. Quantity of concentrates fed/day:

    c. When are they fed?

22. Summer management of goats:

23. Parasites:

    a. External and Internal

    b. Which season of the year?

    c. Local medicines

    d. Diseases and their management:

    e. Preventive management (Vaccination)

Name of the disease	Vaccination details			Remarks
	Date	Medicine	Dosage	

f. Curative practices

Name of the disease	Symptoms	Season	Severity	Treatment*

* Mention local medicines

24. Availability of Veterinary services:

Hospital	Rural Dispensary	Dispensary	Local healers	Distance in kms from house to dispensary

25. Housing:

26. Economics:

Flock size a year before	Present flock size	Sale during the year	Earnings from sale of goats

Avg. earning from sale of each kid	Avg. earning from sale of each buck	Avg. earning from sale of each doe	Avg. earning from sale of each castrated male

Average earning from the sale of skin	Earning from sale of milk/goat	Earning from manure/flock

27. Stall feeding is adopted or not?

28. Trainings undergone:

29. Any other issue / information:

Signature of the data collector

Date:

ANNEXURE 2

REPORTING FORMATS

a. FFS report

- Introduction (including baseline)
- Number of farmers participating in FFS (Male, Female, crop-wise details)
- Number of facilitators involved (ARAVALI, Partner NGO, farmer facilitators, Volunteers)
- Curriculum
- Number of sessions (with average attendance)
- Important LTEs and short studies with results
- Cases studies (Innovations, adoption of goat management practices, involvement of non-participant farmers)
- Field days/sharing events
- FFS cost
- FFS evaluation
- Way forward
- Conclusion

A BRIEF REPORT OF FIELD DAY

Location: **Organization:**

Date	
Village	
Enterprise	
Number of participating (FFS) farmers	Male: Female:
Number of non participating farmers	Male: Female: from …… villages
Guests	Name, designation and institutional affiliation
Highlights of goat farmers' sharing	Significant learnings/quotes, innovations
Highlights of guests' speech	
Special features of field day	
Photos	

ANNEXURE 3

GROUP DYNAMIC EXERCISES: SESSION GUIDES

Given below are the session guides for some of the most commonly used group Dynamics exercises.

1 Water brigade

Objectives

- To exhibit cooperative action
- To discuss factors affecting group work

Materials

Two buckets for each group, water, measuring jar/cup and whistle

Time required

30 minutes

Steps

- Divide the participants into groups of equal number of participants.
- Place two buckets with water at the centre. Depending upon the number of subgroups, keep the small buckets at equidistance from the centre in different directions
- Brief the task: The task is, each group has to transfer the water from the bucket kept in the centre to the empty bucket kept at a distance. The condition is water should pass through palms of all group members.
- Give three minutes time to discuss and plan
- When the signal is given to start, groups begin their task and stop when the signal is given. Stop the game when the water in the centre buckets is about to exhaust.
- At the stop signal, the group members should stop collecting water from the centre bucket. However, they can continue to pass the water already present in their palms to the bucket.

- Measure the water poured in the buckets by the subgroups, using measuring jar/cup.
- The group that transfers more volume of water is the winner.
- Ask the sub-groups to elicit the reasons for their win/loss
- Discuss the factors affecting the performance of a group (like planning, co-operation)
- At the end name the GD

Debriefing

- State the factors affecting the performance of group

2 The Longest Line

Objectives

- To develop sharing abilities and enhance cooperation among participants
- To strengthen the sub-groups

Time required

30 minutes

Materials

Measuring tape

Steps

- Choose an open area
- Divide the participants into subgroups having equal members
- Ask the participants in subgroups to form longest possible line without using any external materials in five minutes
- At the end of the given time, measure the length of the line formed by all groups
- Ask the groups to share the reasons for their success /failure
- Discuss the relevance of this GD in team building
- Name the GD

Debriefing

- How this GD helps in strengthening the groups?

3 Collection of Items

Objective

- To exhibit the team planning and team building capacities

Materials

Lists of materials and envelopes (equal to no. of sub-groups)

Time required

45 minutes

Steps

- Prepare a list of items
- Hand over an envelope containing the list of materials to all subgroups
- Brief the task: Open the envelope and collect the materials mentioned in the list within ten minutes
- Ask all subgroups to present the task accomplished details after the stipulated time to the large group

Suggested material list

1. Five stones
2. Weigh scale meter
3. Flower
4. Glass of water
5. Mahatma Gandhi Picture
6. Two types of insects
7. Handbook of agriculture
8. Full plastic bag of vermin-compost
9. Sari

Considerations while preparing the list of materials

- All the subgroups get the same materials list
- Items may vary depending on the availability
- Some common items, which everyone can collect
- Some limited items
- Some items present in near vicinity
- Some rare items

- Ask the successful and unsuccessful groups the reasons for their performance
- Discuss the importance of planning, role clarity, leadership and collective action
- Name the GD

Debriefing

- State the key learnings from the GD

4 Pen in Bottle

Objective

- Participants exhibit the importance of group work in a problem solving situation

Materials

Thick thread roll, 5 empty water bottles of 1 litre capacity and 5 ball pens, sand/soil

Time required

45 minutes

Steps

- Cut the thread into pieces of 3 meters length (equal to number of total participants)
- Tie one end of the strings (number of strings=number of participants in each subgroup) at the top of the pen. Number of pens tied with strings should be equal to no. of subgroups
- Ask each subgroup to stand in a circle facing outwards
- Place the water bottle on the ground, inside the circle. Make sure that bottle stands firmly by putting a little sand/soil.
- Hand over the pen tied with strings and ask all members to hold one loose end of the string
- Ask the participants to tie the loose end of the string to their abdomen
- Give a task to the subgroups to coordinate their actions to gently drop the pen into the water bottle
- The subgroup that completes the task first will be the winner
- Discuss the factors contributed for solving the problem

Debriefing

- What are the factors that affect group work?

5 Donkey's Tail

Objective

- To exhibit the importance of coordination among the subgroups for effective functioning

Materials required

Donkey picture without tail, towel, one-marker pens to each subgroup (different colours)

Time required

45 minutes

Steps

- Display the Donkey's picture without tail
- Ask each group to nominate a member who can draw the tail of the donkey blind folded and a member of the same group to guide him/her verbally
- Cover the eyes of representative with the help of towel and ask that particular representative to draw missing tail with the guidance of his/her group member
- Ask the other group members to verbally misguide the person who is drawing the tail
- Repeat same procedure for all subgroups
- The nominated member who is successful in drawing the missing tail in correct position is the winner
- Ask the participants to share the reasons for their success or failure
- Discuss the importance of working when there are distractions

Debriefing

- What did you learn from the exercise?

6 Hanging egg

Objectives

- To stimulate the creative thinking and analytical ability

Materials

Eggs, thread rolls, cello tapes, empty water bottles, drawing sheets, newspapers, glasses with water and scissors (equal to number of subgroups). 1 matchbox

Time required

One hour

Steps

- Hang the eggs singly in different places in a room by using thread and cello tape, at about 2-meter height
- Provide a thread roll, cello tape, empty water bottle, newspaper, drawing sheets, glass with water and a scissor to all the subgroups
- Ask the subgroups to develop a device to safeguard the hanging egg when it falls, using the given materials in a stipulated time of 30 minutes.
- After preparation of device, ask the subgroups to explain the model and different ideas they have discussed while developing
- Burn the thread and allow the egg to fall on the device prepared by the subgroups, one after the other
- The egg may safely fall into the devise or may break. The subgroup who could protect the egg is the winner
- Discuss the importance of group work in generating the ideas while developing the device

Debriefing

- What are the creative ideas generated in this activity?

7 Occupation Game

Objective

- To exhibit the importance of individual ability to use sign language

Time required

30 minutes

Materials

Four paper chits, marker pen

Steps

- Write four occupations (carpenter, potter, washer-man, farmer) on different chits
- Ask subgroups to choose a representative for this GD
- Ask the representatives to choose a chit and stand in a line facing the members of his/her group
- Ask them to immediately start enacting (only non verbal) the occupation written on the chit
- Ask the group members to identify different occupations.
- Group that identifies more occupations correctly is the winner
- Discuss the importance of sign language

Debriefing

- What did you learn from this exercise?

8 Nine-Dot Game

Objectives

- To improve the problem solving ability.

Materials

White board, pen or marker, paper/charts

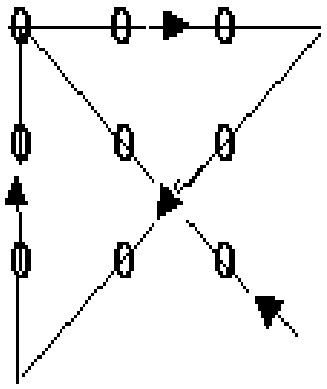
Steps

- Draw 9 dots on the board or chart paper as shown

0 0 0
0 0 0
0 0 0

- Ask the participants to join all the dots using only 4 lines without lifting the pen
- Allow the participants to solve the problem individually and in groups
- When they are unable to solve, give a clue that lines can be drawn beyond the square
- Ask the participants to share their results to the large group
- Discuss the importance of 'Thinking out of box' in solving the problems

Solution

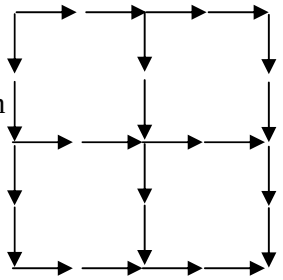


- How can you relate this exercise in taking decision in GESA?

Debriefing

- State the key learnings of the exercise

9 Inheritance



Objective

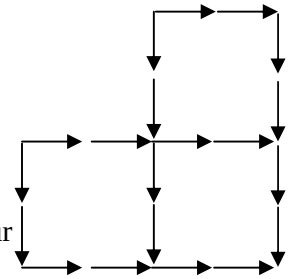
- To exhibit the importance of group work in problem solving situations

Materials

24 matchsticks to each subgroup

Time required

30 minutes



Steps

- Give 24 matchsticks to each group
- Ask each group to arrange the matchsticks in four contiguous squares as shown in the fig.
- Relate the situation with inheritance story.

The Inheritance Story

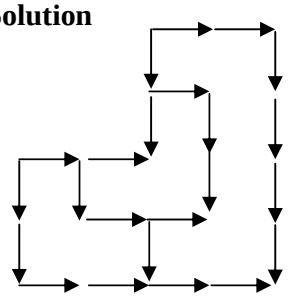
In a village, there lives a couple with four sons. They own four acres of land (as in the figure above. Each square represent one acre of land). The family has been deriving their main source of income from cultivating the land to live comfortably. One day the father became sick and the family had to sell an acre of land for hospitalization. (At this point of the story ask each group to take out one square from the original figure by removing 4 sticks so that the figure looks as shown).

Now the family owns only 3 acres. The father has fully recovered. The sons got married and wanted to divide the land and get equal share. The father has to now divide the 3 acres land into four equal parts.

- Ask the participants to divide 3 acres of land (3 squares) into 4 equal parts and assist the old man in dividing his land. Use 4 matchsticks taken out previously to solve the problem.
- Brief them that the boundaries of the squares should not be altered as the nearby landowners can file a protest. Each group should operate within the given boundaries to form 4 equal figures.

- Allot 20 minutes to solve the puzzle.
- The subgroup, which is able to solve the exercise, is declared as winner. If none could able to solve the puzzle, share the possible solution.

Solution



- Discuss the importance of group work in problem solving

Debriefing

- What lessons we can draw from this GD?

10 Trust walk

Objectives

- To illustrate the importance of trust in the way people build relationships.

Materials

None

Time

40 minutes

Steps

- Divide participants into pairs by asking individuals to select someone they have not yet worked with. Under their elbow and guiding with a supportive hand.
- The exercise is carried out in silence and the chosen area must be safe and free of interruption from outsiders.
- The leader takes the follower around the area at the follower's pace, and guides them towards touching, feeling, holding, sensing any object or surface that is
- In each pair one person leads and the other follows, keeping their eyes closed. The leader takes the follower by placing one hand on their shoulder or safely available (this may include objects and other people).
- As the trainer, you can introduce other noises, smells, and objects for heightened sensitivity.
- After 10 minutes, partners swap roles.
- After both trust walks, in a large group participants ask participants to share their feelings in two roles.
- Discuss issues such as trust, awareness, inner dialogue, sounds, smells, touch, feel, mental pictures, rapport building.

Debriefing

- What are the key learnings of this session

11 Excluding numbers

Objective

- To explore issues of indecision and exclusion amongst a large group

Materials

None

Time

20 minutes

Steps

- Ask the participants to run slowly in a circular fashion
- Shout out number combinations, such as twos, threes, fives. This may produce the correct number of groups of the desired size, or lead to the exclusion of individuals.
- The stranded individuals leave the exercise and sit down.
- The exercise continues for few rounds.
- To process the GD ask the following questions
    - How did you feel when you were excluded?
    - How difficult was it to join a formed group, and so disrupt it?
    - How did you feel when you were in stable groups?
    - What did you think when some one tried to join you?

Debriefing

- What are important learnings from this exercise?

12 Whispering game

Objectives

- To illustrate the breakdown of communication
- To discuss the importance of good communication

Materials

None

Time

20 minutes

Steps

- Ask all the participants to form a circle.
- Then whisper a message to the first person.
- Ask the participants to pass on the message, i.e., whisper to the next person and the next until the message gets to the other end of the circle.
- Ask the last person to receive the message to say the sentence aloud.
- Ask the first person (to whom the facilitator whispered the message) to verify the accurateness or correctness of the message; normally it will be a distorted one.
- Ask the participants to view the degree of change in the original message in communication as changes caused by certain hindrances or barriers to effective communication.
- Discuss the reasons for communication distortion and necessity of good and clear communication in any learning situation.

Debriefing

- Why communication distortion occurs and the ways to minimize it?

13 Watch it

Objective

- To enable participants to observe non-verbal behaviour more effectively

Materials

None

Time

20 minutes

Steps

- Participants are asked to form pairs (A & B) who work together.
- Ask all ‘A’s to assume any position he/she wish and respective ‘B’s observe and try to memorize it –body posture, position of arms and legs, position of hands and feet, tilt of head. Then B turns around.
- Ask ‘A’s to change only one detail in his/her previous position. ‘B’ turns around again, and tries to detect what has been changed. Emphasize that initially A and B should make changes which are easy to detect, but that subsequently the changes made should be more subtle and difficult to detect.
- Ask ‘A’s and ‘B’s to swap the roles.
- Ask them to repeat the activity for few times.
- Conduct the plenary and discuss:
  What is easy and what is difficult to spot, and why?
  What is required to be a good observer?

Debriefing

- What are the key learnings from this GD?

14 Folding paper game

Objective

To demonstrate that it is easy for even simple instructions to be misinterpreted by the recipient, especially if ambiguous words are used, or the recipient does not (or cannot) ask for clarification

Materials

Several sheets of paper

Time

5-10 minutes

Steps

- Select four participants (or ask for volunteers) and ask them to stand facing the remaining group.
- Give each of the four a sheet of paper and give following instructions:
  - Each person must close his or her eyes during the exercise
  - They may not ask any questions.
- Ask them to fold their paper in half and then to tear off the bottom right corner of the paper. Tell them to fold the paper in half again and then to tear off the upper right hand corner.
- Tell them to fold the paper in half again and then to tear off the lower left-hand corner.
- Instruct them to open their eyes and display the unfolded paper to each other and the audience. There is a great probability that they will not all be the same.
- Back in the plenary, discuss
- What words in the instructions could be interpreted in different ways?
- How could the directions have been clearer to reduce the ambiguity?
- How can we encourage people ask for clarification when they do not understand something?

Debriefing

- What is the effect of using ambiguous words while giving instructions?
- What is the effect when the scope is not given to clarify doubts?

Icebreakers / Energizers

Icebreaker/Energizer are tools that enable the facilitators to foster interactions, stimulate creative thinking, change basic assumptions, illustrate new concepts and introduce specific material. They are used to energize the participants and set the tone

for the following session. They are designed to make learning easier and enjoyable experience for the participants.

Objectives

- To break monotony among participants
- To relieve from physical and mental stress when the session persists.
- To trigger presence of mind during session
- To stimulate group members to actively participate in the session

1. Martial arts

Participants are asked to form pairs. In each pair, one stands behind the other. Upon instructions from the facilitator, the participants who are standing behind gently massage the partner. Use three different methods of massage – rub and gentle punch on the shoulders, collar bone and back. After a minute, instruct the participants in each pair to change roles.

2. Rain clap

Show the participants how the claps need to be synchronized while counting numbers 1 to 4. Ask the participant to clap one finger on the palm of other hand when number 1 is said. When number 2 is said, participants have to clap two fingers on the palm of other hand. The same should continue for three and four. Give the command of the numbers in ascending order – 1,2,3,4 & then in the descending order – 4,3,2,1 respectively. Then ask them to close their eyes and follow the command. When this is done in quick succession, it induces the sound of rainfall intensifying and then decreasing.

3. Dancing doll

Ask the participants to stand up and do the following actions:

Raise the right hand in a posture of fixing the bulb in the holder

Use the left hand in a posture to open a tap for letting the water out, with the first posture unchanged.

Then, take posture to put off the cigarette with the right leg while continuing the previous positions.

Ask the participants to perform all these movements simultaneously for a period of time to evolve a dancing movement.

4. Pond and bund

Ask the participants to stand in a circle. Instruct them that when the command is given they have to perform the actions accordingly

- 'POND', all participants should jump forward
- 'BUND', all the participants should jump backward

Ask them to repeat the actions in accordance with the command given to them

Repeat the process a little faster as it will cause more confusion and will mislead participants to make the wrong move.

Participants who misstep the action against the command will have to sit out of the game.

After five to six participants are out, the game can be stopped.

5. Nose, head, eye…

Ask the participants to stand in a circle. Instruct them to touch the body part according to the 'command', strictly 'looking at the facilitator'. But, the action of the facilitator may differ from his/her own command, to create confusion. Words like nose, ear, head, leg, stomach, hair, nail, etc. can be used as commands. Participants who miss the action against the facilitator's command will have to sit out of the game. Ask the participants to repeat the actions in accordance with the command (Facilitator's command and action need not match to misguide the participants). Repeat the process a little faster as it will cause more confusion and will mislead participants to make the wrong move. After five to six participants are out, the game can be stopped.

This exercise helps to increase the concentration.

6. Fruit salad

Choose five fruit names (banana, mango, apple, grapes, orange) Ask a participant to choose one name out of 5 fruit names. Ask the person seated next to him/her to choose another name. Five participants seated in a row get the name of each of the five fruits. Continue the same and ask others to repeat the chosen fruit names one after another. Thus, each of the participants will get one of the fruit names.

Ask them to sit on chairs in a circle. The number of chairs should be one less than the total number of participants. One of the participants will stand up and call out a fruit name from the five fruit names.

Participants who have chosen that particular fruit name should interchange their seats. Taking the opportunity the participant who remains standing grabs a chair to sit down. So, one person fails to get a chair to sit.

This person will repeat the same. However, when the person standing calls out 'FRUIT SALAD' all the participants should interchange their seats.

Continue the game for 2-3 rounds.

7. Stone, Scissors and Paper

Divide the participants into two groups. Ask the groups to form two lines and face each other.

- Brief the instructions
  - Stone is superior than scissor
  - Scissor is superior than paper
  - Paper is superior than stone
- Ask the groups to show any one symbol (for paper-palm, for stone-wrist and for scissor- show the fingers indicating a scissor) after discussing in their groups upon whistling. Both the groups have to show the symbols simultaneously as discussed in their groups.
- Based on the symbol showed by the groups, display the scores on a chart (The group that shows a comparatively superior symbol will score a point. If the group 1 shows stone and group 2 shows scissor, group 1 will get 1 point and group 2 will get 0).
- Continue the game for five-six rounds
- Consolidate the score and declare the winner.

DISCLAIMER

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ARAVALI works with various development stakeholders to enhance their capacity; support them to understand the **concept of livelihoods** for marginalized communities of the state and enable them to take on livelihood initiatives. **ARAVALI focus for strengthening and building capacities** (technical, social and institutional) of **NGOs** in the state to effectively implement rural livelihood enhancement programmes.

Work with Government to promote and facilitate **development collaboration** among Government, NGOs, PRIs and other development stakeholders. Thus, contributing in development of an enabling environment for NGOs in Rajasthan for effective development partnerships.

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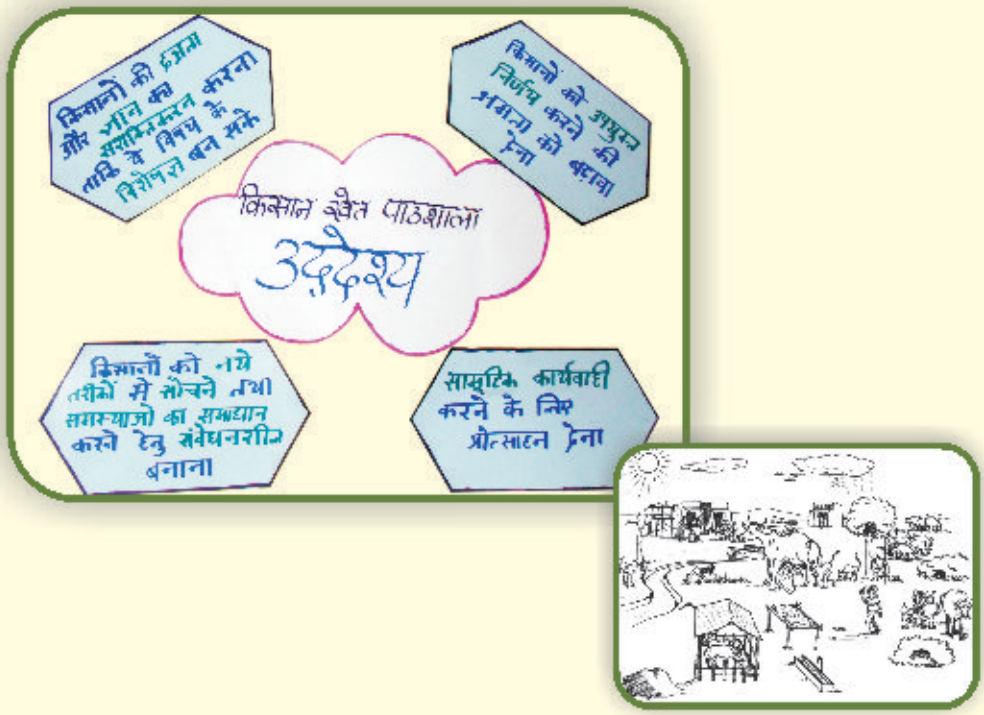

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