



## RESEARCH ARTICLE

### COMPARATIVE KNOWLEDGE OF RURAL WOMEN ON FEED RESOURCES AND FEEDING SYSTEMS DEVELOPED FOR LIVESTOCK IN RAINFED AND IRRIGATED ZONES OF INDIA

\*Manju Suman, Mahavir Singh, Ashok Kumar and Mallaya

Indian Grassland & Fodder Research Institute, Jhansi-284003, India

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#### ABSTRACT

Most of the work involving livestock management is considered the traditional responsibility of farm women in India. To make livestock extension programme's effective it is imperative to study the involvement of women, their perceptions and knowledge. This paper describes briefly some studies carried out with women from various communities, in a irrigated pockets of North India i.e. Uttar Pradesh and dry region Rajasthan. The studies revealed that the women have a great deal of information about local feed resources and a good working knowledge of animal behavior, feed preferences and production characteristics. Through experience the women have developed feeding practices to suit different types of livestock. They have identified beneficial feed resources, ranging from farm by-products to forest products. The rural men and women have also developed ways of conserving useful feed material for periods of scarcity. This paper recommends that groups of women facilitators be developed as well as suitable extension and training programmers which include women. Likewise, this paper discusses development strategies which may lead to improvement in feeding and management practices suitable for more productive livestock systems. These practices are developed through a participatory approach. Development planners and researchers pay very little attention to women's perceptions, needs and constraints, although many talk about the role of women in livestock production (particularly livestock feeding). This paper strongly recommends more studies on the involvement of women, giving more weight to their views and making use of their experience and knowledge.

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## INTRODUCTION

Livestock are not only a part of the farming system in India but are also closely linked with religion and culture. Thus livestock are not only a source of employment, income and food but are also critical to strong socio-cultural linkages in countries like India. These animals were given a place of importance by the society in recognition of their contribution to human welfare. Evidence of this importance is noted by references in ancient scriptures, by their place of prominence among the official seals of the Harappan civilization dating 4000 BC and by the special festivals dedicated to livestock. The involvement of women with livestock is much more than just with crops. This involvement is probably indicative of the same socio-cultural linkage. While most of us are aware that livestock management is considered the traditional responsibility of women and that women shoulder most of the workload, the subject has been neglected too long by researchers and development planners (Swaminathan 1988, 1990). The involvement of women is just now receiving some attention, as is evident from the number of

conferences organized and bulletins published on the subject during the last few years (ICAR 1988; Vishwanathan 1989; FAO 1991).

## MATERIALS AND METHODS

This paper is based on studies, observations and experiences during the author's involvement in irrigated parts of Uttar Pradesh and Rajasthan. One irrigated part comprising Meerut and Baghat district of U.P. and other is Rain-fed zone comprised of Jodhpur and Bikaner districts of Rajasthan. Studies were conducted in different agro-ecological conditions involving different socio-economic groups with emphasis on tribal's and pastoralists. Two stage purposive sampling were used. From each district three villages were selected randomly and from each village sixteen farmers who were growing fodder from each village were selected. In that, a total of one ninety two respondents were selected. The data were collected pre tested schedule. The data were collected in year 2008 -09, to 2010. This paper focuses on aspects related to animal feeding knowledge awareness, decision making of power with an emphasis on the ingenious ways women use local resources and optimize this use through the making of mixtures, the

\*Corresponding author: Manju Suman,  
Indian Grassland & Fodder Research Institute, Jhansi-284003, India.

processing of various materials and the adoption of new technologies.

### Role of women in livestock production

The results indicate that feeding, cleaning and milking of dairy animals, the care of young animals and administration of medicines are done mostly by women. Observations in both the states show that involvement varies due to socio-economic status as well as region (George 1990). It was observed that women from tribal families carry out both indoor as well as outdoor jobs unlike general caste and women from rich families who hardly undertake any work. However, in pastoralist families work is evenly shared between men and women, maybe because livestock is the major source of livelihood. Similar variation in work sharing is reported with respect to goat management (Ahuja and Rathod, 1987; Suman *et al.*, 2006). The feeding of animals (concentrate and roughage) is mostly by women, irrespective of socio-economic conditions. Amongst the poor families fodder is brought mostly by women who go out to work as labor. Preparation of home-made feed is exclusively by women, as is also the processing of feed (wherever practiced) i.e. cooking. A few observations are indicated in Table 1.

### Decision-making

It was rather difficult to gather factual information about the decision-making process and the technique of "socializing and kitchen talk" had to be used to break reservations. The results indicate that the generalizations made in some reports (Punia and Yadav 1990) that most decisions on livestock production are made by women, was not noticed in the area of study. The aspects related to disposal of milk and milk products and feeding of animals were decided by women in most cases (except in commercial operations). The decisions about disposal of other products like meat, hair and wool were made by men. Decision-making regarding sale and purchase of animals varies between region and socio-economic groups. Similar observations are reported by George (1990), Suman *et al.* (2006) who has tried to draw attention to the marginalization of the women with progressive development. The decisions on use of income varies widely with the socio-economic status of the family. (Please see result are indicated Table-1).

### Awareness, perceptions and knowledge of women

Livestock management was always perceived as the traditional responsibility of women. For women, livestock are important as a source of fuel, food and as a source of supplementary income for the family. For most of the women high fat in milk is more important than quantity of milk (Rangnekar, 1992). Many women prefer keeping goats due to ease of handling, low input need, cheap source of good quality food for the family and also the manure (Rangnekar, 1992). Women possess good knowledge of various aspects of livestock production management and particularly of feed resources. They know each animal's production characteristics, temperament and feeding behavior. Most women are aware of the need for good quality feed to achieve better production but feel that feeding to a non-producing animal is not necessary. The salient features pertaining to information gathered from women regarding local feed resources, the traditional practices observed for conserving useful feed material, methods of processing feeds, ingenuity of women in adopting new

processing technologies, and strategies of partitioning available feed resources for optimal utilization will be described. Critical studies and proper understanding of traditional methods, which have emerged out of long-standing experience, supplemented with newer knowledge could help in developing effective animal feeding strategies for more productive animals. Such efforts are necessary simultaneously with breeding improvement efforts and need to be taken-up on a large scale in livestock development programmes. A results are indicated in (Table 2,3 & 4)

### Identification of beneficial feeds and local feed resources

Besides the major feed resources like crop residues and cultivated fodder, the women were found to be well aware of locally existing grasses, creepers, bushes, weeds and tree species which could be utilized as supplementary feeds and drought feeds. Besides popularly known trees, grasses and bushes, women have identified a number of local species as beneficial for dairy animals. Interestingly they point out that tree or bush species beneficial to or liked by the cow, buffalo or goat, are different. A few species extensively used in many villages of north-east Gujarat were chosen for study. The benefits claimed were ratified with the help of extension officers and women workers, who discussed their observations with women farmers from several villages. These observations on a few of the feed materials are summarized in (Table 5). In tribal areas women collect creepers like *Tinosperma* and leaves of *Alangium* and *Moringa* species for feeding milch cows and buffaloes. The pods of *Acacia* and *Prosopis* species are mostly fed to goat and buffalo. The leaves of *Azadirachta* and *Acacia species* are fed mainly to goat. The *Bassia latifolia* tree commonly known as Mahuva tree is fascinating and there is a social taboo against the cutting of this tree probably due to the recognition of its value in tribal areas. The leaves, flowers and fruit covers are used for animal feeding and the oil from the seed is used for cooking; its oil cake is fed to livestock in some areas but considered toxic in other areas. The flowers are known to be rich in energy and are used for human consumption in scarcity, for preparing local alcoholic drinks and also for animal feeding. The flowers are mostly fed to bullocks during the working season and if surplus quantity is available these are offered to milch animals. Farmers have been using cotton seed and cotton seed cake for a long time and always claimed beneficial effects for the animal and for the fat content of milk. Researchers have only recently realized the usefulness of these materials as a protein source (Rangnekar 1991; Suman *et al.*, 2006).

### Conservation of feeds

Conservation of feed and fodder is usually discussed by most technicians as a new technology (to be transferred to the farmers). However, while studying the traditional practices of feeding animals it was noticed that conserving supplementary feeds for use during the dry season is a traditional practice. Through their experience, women have identified supplementary feeds beneficial to animal productivity. Most of these are available seasonally and are generally dried and stored for use in the dry season. On laboratory analysis it was found that most of these materials are rich in protein and a few are rich in energy and minerals and thus they are bound to have a beneficial effect on animals that usually are kept on a straw-based diet. Table 4 summarizes information on some of the commonly stored feed materials.

**Table 1. Observations on work-sharing and decision-making (%) by income base grouping**

Work-sharing	Poor	Medium	Rich
Cleaning	W100	W100	O100
Feeding	W 80	W 80	O 90
Watering	W100	W 90	O100
Milking	W 80	W 90	O100
Grazing	W 80	W 90	O100
Managing bullocks	NA	M 90	O100
Decision-making			
Disposal of Milk	W 80	W100	W 50
Sale of Animal	W 40	W 65	M 90
Purchase of Animal	W 80	W 80	M 80
Breeding	NA	W 80	M 80
Vaccination	NA	W 80	M 90
Type of feed	NA	W 80	M 90
Type of fodder	NA	M 80	M 90

Notes:1. Abbreviations used - W for women, M for men, O for others (usually hired labor), NA - not applicable.

**Table 2. Farmers knowledge towards livestock management in Irrigated and Rain fed Zone**

S.No.	Management	Knowledge	Irrigated Zone		Rainfed Zone	
			Male	Female	Male	Female
1.	Feeding	Very good	48.1	70.8	53.9	71.4
		Good	39.9	22.0	32.1	19.7
		Average	6.3	2.1	2.7	1.5
		No	5.7	5.1	11.3	7.4
2.	Milking	Very good	29.2	96.9	19.8	91.7
		Good	30.1	1.0	36.4	7.3
		Average	11.5	0.0	14.6	0.0
		No	29.2	2.1	29.2	1.0
3.	Housing	Very good	31.2	77.0	41.7	91.7
		Good	35.4	14.6	27.1	8.3
		Average	4.2	2.1	6.2	0.0
		No	29.2	6.3	25.0	0.0
4.	Health care	Very good	78.5	72.2	64.6	61.8
		Good	20.8	10.4	29.2	25.0
		Average	0.0	0.0	3.4	11.8
		No	0.7	8.4	2.8	1.4
5.	Utilization of Milk	Very good	58.3	72.9	68.7	93.8
		Good	37.5	22.9	31.3	6.2
		Average	4.2	0.0	0.0	0.0
		No	0.0	4.2	0.0	0.0
6.	Cake Dung	Very good	2.1	83.3	2.0	87.5
		Good	12.5	14.6	6.3	12.5
		Average	25.0	0.0	31.3	0.0
		No	60.4	2.1	60.4	0.0

**Table 3. Farmers perception towards fodder production and livestock management in Irrigated Zone**

S.No.	Perception of the farmers	Agree	Disagree	Undecided
Regarding Fodder production				
1	Livestock rearing is beneficiaries for economic up liftment.	97.9	2.1	0.0
2	Growing green fodder is beneficial to farmers.	97.9	2.1	0.0
3	Improved variety of green fodder help in increasing economic condition of the farmers.	92.7	6.3	1.0
4	Attack of insect and pest is more improved varieties of fodder.	67.7	12.5	19.8
5	Use of fertilizers is essential for green fodder.	25.0	29.2	45.8
6	Use of plant protection measures for green fodder.	56.3	33.3	10.4
7	Feeding of green fodder to animals reduce the cost of milk.	80.2	5.2	14.6
8	Use of year round fodder production technology is beneficial.	89.6	6.2	4.2
9	Dry fodder is easily available from market / concentrates.	61.4	27.1	11.5
10	Use of readymade feed is beneficial over homemade concentrates.	59.4	20.8	19.8
11	Providing supplementary ration during last stage of pregnancy would increase milk yield.	54.2	10.4	35.4
12	Providing sufficient water to animal is beneficial.	93.8	3.1	3.1
Regarding livestock management				
1	Cross breed animals cattle are beneficial to obtain more milk yield.	93.7	4.2	2.1
2	Exotic breed is bull for insemination is beneficial.	76.1	10.4	13.5
3	AI service is more beneficial over natural service.	58.3	25.0	16.7
4	Oxytocine vaccine to milking animals is beneficial.	10.4	10.4	79.2
5	Proper housing management is beneficial.	93.8	5.2	1.0
6	Proper veterinary facilities are beneficial.	81.2	9.4	9.4
7	Deworming and vaccination of calves are beneficial.	90.6	7.3	2.1
8	Sukle of calves/weaned is beneficial.	87.5	9.4	3.1
9	Protection of animals from bed weather is beneficial.	21.9	3.1	75.0
10	In case of diseased, veterinary doctor treatment is beneficial over traditional treatment.	65.6	21.9	12.5

**Table 4. Farmers perception towards fodder production and livestock management in Rain fed Zone**

S.No	Perception e of the farmers	Agree	Disagree	Undecided
1	Livestock rearing is beneficiaries for economic up lift-ment.	100.00	0.0	0.0
2	Growing green fodder is beneficial to farmers.	64.6	27.1	8.3
3	Improved variety of green fodder help in increasing economic condition of the farmers.	22.8	27.1	50.0
4	Attack of insect and pest is more improved varieties of fodder.	27.1	25.0	47.9
5	Use of fertilizers is essential for green fodder.	47.9	31.3	20.8
6	Use of plant protection measures for green fodder.	41.7	20.8	37.5
7	Feeding of green fodder to animals reduce the cost of milk.	93.8	2.1	4.2
8	Use of year round fodder production technology is beneficial.	29.1	54.2	16.7
9	Dry fodder is easily available from market / concentrates.	45.8	50.0	4.2
10	Use of readymade feed is beneficial over homemade concentrates.	72.9	16.7	10.2
11	Providing supplementary ration during last stage of pregnancy would increase milk yield.	89.6	4.2	6.3
12	Providing sufficient water to animal is beneficial.	91.7	4.2	4.2
Regarding live stock management.				
1	Cross breed animals cattle are beneficial to obtain more milk yield.	93.8	4.2	2.1
2	Exotic breed is bull for insemination is beneficial.	50.0	18.8	31.2
3	AI service is more beneficial over natural service.	60.4	8.3	31.2
4	Oxytocine vaccine to milking animals is beneficial.	22.9	20.8	56.3
5	Proper housing management is beneficial.	89.6	4.2	6.2
6	Proper veterinary facilities are beneficial.	77.1	8.3	14.6
7	Deworming and vaccination of calves are beneficial.	85.4	2.1	12.5
8	Sukle of calves/weaned is beneficial.	85.4	4.2	10.4
9	Protection of animals from bed weather is beneficial.	29.2	31.3	39.6
10	In case of diseased, veterinary doctor treatment is beneficial over traditional treatment.	79.2	10.4	10.4

**Table 5. Characteristics of feed resources that are usually conserved and stored**

Name of feed		
material	availability	
Mahuva flower	April/May	Rich in energy
Pods of Acacia & Prosopis	March/April	Rich in energy & Protein
Leaves of Ziziphus	April/May	Rich in protein
Leaves of <i>Prosopis cineraria</i>	March-May	Rich in protein & Minerals
Leaves and pod covers of Pulses and Oil seed crops	October/ March/April	Rich in protein and Minerals

### Feed processing - traditional methods and adoption of new technology

Studies on traditional systems revealed that processing of feeds, although projected as a new approach has always been used by the livestock owners. They have devised and adopted processing methods found to be useful for feeding management as well as animal productivity. The processing work is usually done by women. Some of these methods have been studied and found to be scientifically sound and beneficially effective. The commonly processed materials are a mixture of concentrates and roughages like wheat straw, pulse pods and maize cobs, which are mixed and cooked on low heat for a couple of hours. In maize growing areas it is a common practice to cook maize cobs mixed with Tamarind, salt, brans and sometime cereals. Another commonly used material is cotton seed where cooking does have beneficial effect. Soaking the feed for a few hours or sometimes over-night is another common practice, because soaking reduces dustiness, prevents wastage and improves intake. The women were also found to be innovative in the adoption of new technologies. In the on-farm trials with urea treatment of cereal straws were in progress, there was need to find out simple methods for measuring water and ensuring uniform spraying of urea solutions. The women farmers devised simple ways of overcoming this problem. In some areas they started making use of used oil cans which had fixed volumes and the water could be measured easily. The bottom of the can was

perforated for ease of spraying. In other villages they used water buckets, which also had fixed volumes and spraying was done with the help of broom sticks. The result of the on-farm trials showed that the treatment was effective since the spraying was uniform. The experience clearly indicates that the ingenuity of women could be effectively utilized when taking a participatory approach to development or to the introduction of beneficial technologies.

### Partitioning of feeds

Availability of good quality feeds and fodders is always a constraint in rain-fed and under-developed areas. Feeding accounts for almost 70% of the cost of livestock production. While farmers are usually blamed for keeping an unnecessarily large number of animals (many of which are considered unproductive and who eat away the feed which would have been available for productive animals), a critical look at the practices adopted by the farmers, particularly the women, indicates that through experience they have developed effective ways of optimizing utilization of available feed resources. A few examples of strategies that partition available feed resources for optimal use will be described to illustrate the ingenuity of farmers. Cereal straws are the staple feed for livestock in India and a major source of bulk and energy. The farmers are aware of variation in digestibility and nutrient availability between the varieties and parts of the plant. In western India it is a common practice to offer sorghum straw,

which is known to be of superior quality, as a whole plant. The animal eats by preference the more nutritious parts (leaves and upper portion) and the remainder of the plant, the main stem or stubble, is left over and offered to non-producing animals. The mulch buffalo, the main dairy animal in India till recently, is usually stall fed. Available concentrates and good quality fodder are offered to these animals. High producing animals, recently calved animals, or those in late pregnancy are offered special supplementary feeds like edible oil, jiggery, grains and oil cake. Materials like cotton seed, cotton seed cake, copra cake, and rice polishing were recognized historically as beneficial and have been traditionally used for buffaloes or high producing cows. Researchers have realized their value as a source of undegradable protein only recently. These practices are clearly indicative of the farmers' wisdom and show that their approaches are exercises of resource optimization. Hence before we criticize them for resistance to change or try to forcefully introduce systems according to our own thinking, it is essential to critically study the traditional practices.

### Conclusion

In the conclusion, it can be concluded that women involvement in livestock production feeding and all activities of livestock management were in both the zone and high knowledge in traditional practices of feed management and so many constraints faced by farm women in livestock rearing and feed management. It was observed that decision taken percentage more farm women in related livestock activities and reverse trend was observed in crop production by man. It is possible to find solutions to many constraints from the farmer themselves and particularly from women (especially about the feeding of livestock). For effective extension work and the effective use of farmer's experience and knowledge, it is necessary to establish rapport, to socialize with the farmers and to learn from them. Many women farmers can be effective resource persons and extension agents. An initial attempt at

developing a small group of young women in a few villages of Gujarat and Rajasthan to work as facilitators was very encouraging.

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