

**CONTRIBUTION OF FEMALE HEADED
HOUSEHOLDS IN SMALL SCALE DAIRY
PRODUCTION SYSTEM: A GENDER PERSPECTIVE**



THESIS

*Submitted in partial fulfilment of the requirements for the degree
of
Master of Veterinary Science
in
VETERINARY EXTENSION EDUCATION*

By
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Roll No. 4934

To
**DEEMED UNIVERSITY
INDIAN VETERINARY RESEARCH INSTITUTE
IZATNAGAR - 243 122 (U.P.)**

2012



Dedicated to....

My beloved Parents





DIVISION OF EXTENSION EDUCATION
INDIAN VETERINARY RESEARCH INSTITUTE
IZATNAGAR - 243 122, U.P. INDIA



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Dated : 31.05.2012

Certificate

*Certified that the research work embodied in this thesis entitled “**Contribution of female headed households in small scale dairy production system : A gender perspective**” submitted by **Dr. Jyoti Yadav**, Roll No. **4934**, for the award of **Master of Veterinary Science** degree in **Veterinary Extension Education** at Indian Veterinary Research Institute, Izatnagar, is the original work carried out by the candidate herself under my supervision and guidance.*

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*We have carefully gone through the contents of the thesis and are fully satisfied with the work carried out by the candidate, which is being presented by him for the award of **Master of Veterinary Science** of this Institute.*

*It is further certified that the candidate has completed all the prescribed requirements governing the award of **Master of Veterinary Science** of Indian Veterinary Research Institute.*

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(Jyoti Yadav)

Abbreviations

%	:	Percentage
A.I.	:	Artificial Insemination
CB	:	Crossbred
DWCRA	:	Development of Women and Children in Rural areas
EADD	:	East Africa Dairy Development Project
FAO	:	Food and Agricultural Organization
FHHs	:	Female Headed Households
GDP	:	Gross Domestic Product
ha	:	hectare
HYV	:	High Yielding Variety
IFAD	:	International Fund for Agriculture Development
Kms	:	Kilometers
MHHs	:	Male Headed Households
NGOs	:	Non-Governmental Organizations
OBC	:	Other Backward Class
PD	:	Pregnancy Diagnosis
Rs	:	Rupees
SC	:	Schedule Caste
SD	:	Standard Deviation
SHGs	:	Self Help Groups
UP	:	Uttar Pradesh

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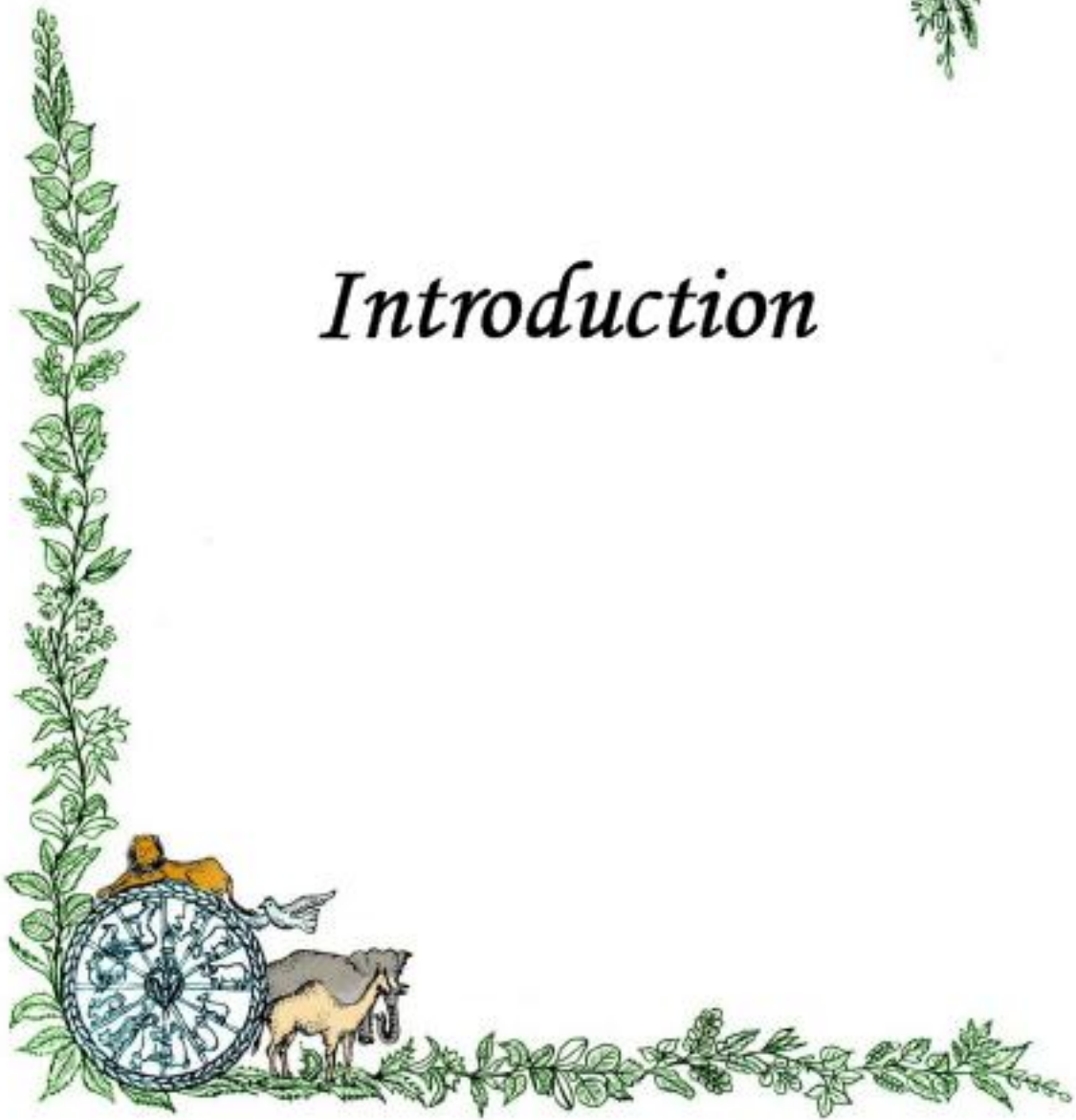
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Introduction



Chapter-1

Introduction

The livestock sector is one of the fastest growing segments of the agricultural economy, particularly in the developing world (Delgado *et al.*, 2009). Livestock are treated as a form of financial, social and natural capital (McLeod and Wilshire, 2001). They are raised mainly for meat, milk, skin, and provide a flexible financial reserve (social security) in bad crop years for the rural population (Puskur *et al.*, 2004; Rangnekar, 2006). It contributes 40 per cent of the global value of agricultural output and supports the livelihoods and food security of almost a billion people. At the global level, livestock contributes 15 per cent of total food energy and 25 per cent of dietary protein. Livestock products represent a growing proportion of agricultural exports. Their share of agricultural export value globally rose from 11% to 17% between 1961 and 2006 (FAO, 2009). Among by-products of livestock, manure has its own importance. Collection and preparation of dung cakes is not only the source of income but it is also used as fuel for cooking and saves the rural women labor required for collection of fuel wood (Mc Corckle, 1987). Other researches also revealed that livestock sector growth can also promote broader economic growth (Pica *et al.*, 2008) and that smallholders can contribute to this (Delgado *et al.*, 2008). The purposes of maintaining the livestock are different in different societies in gender perspective like for income generation, food security, draught purpose, fuel and manure, traditional life style and paying school fee (Heffernan *et al.*, 2003). Thus livestock is an important asset for women because it is often easier for many women in developing countries to acquire livestock assets, whether through inheritance, markets or collective action processes, than it is for them to purchase land or other physical assets or to control other financial assets (Rubin *et al.*, 2010).

In developing countries, women contribute to both viable and subsistence agriculture, including livestock and fishing, as casual laborers and unpaid family workers. Women's involvement in livestock production and development has been a long-standing global tradition. In animal husbandry, women play multiple roles. Their activities vary widely ranging from care of animals, grazing and fodder collection, cleaning of animal sheds to processing milk and livestock products. In livestock management, indoor jobs like milking, feeding, cleaning, etc. are done by women in 90 per cent of families while management of male animals and fodder production are effected by men (Narayanan, 1997).

Many of the important tasks in animal husbandry activities are performed by women besides fulfilling their responsibilities as home makers (Randhawa and Chandra, 1993) irrespective of female or male headed households. According to Sangwan *et al.* (1996) there is a distinct sphere of participation between males and females in farm and dairy sectors. Men were the planners and women implemented the activity. Women often have a prominent role in managing poultry (Gueye, 2000) and dairy animals (Okali and Mims 1998; Tangka, Jabbar and Shapiro, 2000) and in caring for other animals that are housed and fed within the homestead. Thus dairying at household level is the domain of women. When tasks are divided, men are more likely to be involved in constructing housing and herding of grazing animals and in marketing of products if women's mobility is constrained.

Agriculture in India, contributes about 15 per cent of Gross Domestic Products, is increasingly becoming a female activity. There are 75 million women engaged in dairying compared to 15 million men, and 20 million women in animal husbandry as against 1.5 million men (Srinath, 2012). They constitute about 55 per cent to the total agricultural labor and 60 per cent of the labor engaged in livestock (Brij Bala *et al.*, 2006). They share responsibility with men and children for the care of animals

and particular species and types of activity are more associated with women than men. The role of women in livestock is well documented by FAO (2002) and her role and responsibility increases, when she has headship of the house.

Identifying and supporting the roles and capabilities of women as livestock owners, processors and users of livestock products are key aspects to promote women's economic and social empowerment and consequently a rural women's ability to break the cycle of poverty. Moreover, access, control and management of resources such as grazing areas and feed resource, provide assets that improve women's equality and empowerment with an overall positive impact on the welfare of the household (IFAD, 2009). Ownership of livestock is particularly attractive to women in societies where access to land is restricted to men (Bravo-Baumann, 2000).

The influence of women is strong in the use of milk for home consumption and they often have control over marketing and the income from the milk and milk products. Perhaps for this reason, small scale dairy projects have been popular investments for development projects aiming to improve the lot of rural women. There is an increasing awareness of the important and long standing traditional role of women in small scale dairying all over the world. Dairying provides women with a regular daily income, vital to household food security and family well being. Women are not only centrally involved in milk production, but also in collection, processing and marketing of dairy products, roles which were often overlooked by development programmes. In the past, projects and programmes were directed towards men and changes introduced frequently resulted in higher labor input by women, while at the same time, their control over the production process and its output diminished. Small scale dairy production to be important in meeting the needs of rural consumers, the demands of growing urban populations are increasingly supplied with

milk from intensive commercial systems. This has important implications for the engagement of women in the livestock sector because of the different roles, responsibilities and access to resources that are evident within different scales of production system and at different points on the production and marketing chain (FAO, 2011).

Therefore, educating rural women about modern technologies in livestock husbandry and allied fields can go a long way in enhancing their knowledge and skill and ultimately, the productivity of the livestock and farm Income. Women in rural areas also invest a large part of their time, labor and expertise in agricultural and livestock production. Small stock is particularly closely associated with women so it is important to consider gender in any attempt to develop small stock production. While there is huge variation around the world, the day-to-day labor of caring for small stock is almost mainly done by women (and to some extent children). Women are able to acquire small stock through the sale of crop produce and the cash raised allowing them to make their initial purchases or restock (Okello and Obwolo, 1984).

In many parts of the world today, there is an increasing trend towards what has been termed the 'feminization of agriculture'. War, sickness, death and migration of men from rural areas to towns and cities in search of paid employment have reduced the male populations that are engaged in agriculture. In Africa, the male population in rural areas is falling rapidly, while the female population remains stable. For example, during the 20-year period between 1970 and 1990, the rural male population in Malawi declined by 21.8% while that of the rural female population declined by only 5.4% (FAO, 2008). In some conditions like death of husband, divorce, separation or desertion, migration of males for employment, female remain alone in the house hence they become head of the house. Along with households work, they go for agriculture & animal husbandry or both for

income generation & to fulfill the households requirements. In such households, she is more likely to be considered the owners of small stock compared to larger livestock, and to have a say in the disposal and sale of small stock and small stock products, and in the use of income from this. According to census of India 2001, there are 19,987,858 female headed households out of this, Uttar Pradesh has 2,031,752 female headed households and at all India level, 10.35 per cent households are female headed and the average size of female headed is 4 whereas the average household size for male headed household is 5.4, out of every 1000 households, currently married males head a vast majority of households i.e. 835, followed by the category of widowed where from 68 are female headed. Role of female headed households in small scale dairy production is well recognized, but much less has been documented. Female headed households are as successful as male headed households in generating income from their animals, although they tend to own smaller numbers of animals, probably because of labor constraints. However, women also suffer from many broader constraints compared to men, in their access to land, capital, information and marketing opportunities and adoption of improved technologies which may affect small stock production and the benefits gained from it. Gender analysis is therefore very important in planning and implementing small stock development both for female and male headed households. A number of studies have been carried out on the participation in livestock husbandry, but no comparative study has so far been carried out in small scale dairy production system in the female headed households and its comparison with male headed households in terms of livestock production, access & control of resources, roles and technological constraints in adoption of livestock technologies etc. In view of the above justification, the proposed research has been carried out to study contribution of female headed households in small scale dairy production system in the gender perspectives.

1.1 SPECIFIC OBJECTIVES

1. To study the socio-economic and communication profile of respondents.
2. To compare the productivity of milch animals between the female and male headed households.
3. To study the gender disparities in participation, mode of acquisition of livestock, its ownership and control between the female and male headed households.
4. To understand the various input delivery systems and accessibility to extension services, trainings, animal health services, marketing and credit.
5. To study the women's constraints in technology adoption in small scale dairy production system.

1.2 PRACTICAL UTILITY

The present study yielded useful and empirical information on the productivity of milch animals, participation, access to input, extension services, training, animal health services, marketing, credit, ownership and control in female headed versus male headed households. Difference in the productivity of milch animals, accessibility to various input, role, constraints in technology adoption in small scale dairy production system thus would form a basis for formulating appropriate recommendations for interventions towards improving the productivity of milch animals in female headed households.

The result of study would help in sensitizing various government and nongovernment organizations including other development departments to be more effective and gender balanced in offering extension, input, credit and other services to women involved in livestock production. The results may help in designing the specific strategies for training, communication, transfer of technology and other extension programmes for female headed households in livestock production. Recognizing the

key role, women play in small scale dairy production would also help them in increasing the productivity of livestock for themselves and their households. It may also increase the involvement of women in technology designing, testing and dissemination process. The study identified some specific gaps, indicators and the constraints on the contributions that the livestock make in enhancing the livelihood of female headed households and asset portfolios. Conducting such research in appropriate time to review the past and current research on female headed households in gender perspective and small scale dairy production, identified the pertinent issues and knowledge gaps for interventions, researchable issues and development agenda specifically for female headed households.

Comparative data on productivity of small scale dairy production system kept by men versus women would help in providing the opportunities for sustaining the productivity in view of socio-economic characteristics introducing the appropriate gender specific interventions for further intensification.

1.3 LIMITATIONS OF THE STUDY

1. This study was confined to a particular geographical area. Hence the findings obtained by the study can be generalized to only those regions where similar conditions exist.
2. The investigation did not suffer any unusual limitations other than the common ones like time and physical facilities of a single student researcher.
3. It was difficult to carry out the study exclusively on female headed households with larger sample due to difficulty in finding such households in the limited period of time in limited study area to carry out the research.

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*Review
of
Literature*

Chapter-2

Review of Literature

Comprehensive review of literature is an essential component of any research endeavor. The major function of the review of literature is to get acquainted with the past and contemporary research in the particular field of investigation. Keeping in view the objective of the study, the review of literature has been presented in the line with objectives of the study, under following subheads:

- 2.1 Socio-economic and communication profile
- 2.2 Productivity of milch animals
- 2.3 Participation, mode of acquisition of livestock, its ownership & control
- 2.4 Input delivery systems and accessibility to various services
- 2.5 Constraints in technology adoption in small scale dairy production system

2.1 SOCIO-ECONOMIC AND COMMUNICATION PROFILE

Ray and Chowdhary (1996) conducted a study on perceived constraints of the scheduled caste women in performing their role in crop husbandry, animal husbandry and poultry keeping in the Hajo development block in Assam. Majority of the respondents (48%) belonged to young age group (<36 years), followed by 40 per cent belonged to old age (>39 years) and remaining 12 per cent belonged to middle age group (36-39 years). Majority of the respondents (77%) were illiterate, followed by 11 per cent, who were only able to read and write and 7 per cent were educated upto primary level. More than half of the respondents (51%) had less than 1.5 ha land, 2.4 per cent had 1.5 to 7ha, 13 per cent had 7 to 15 ha and the rest 12 per cent respondents had 15 to 30 ha land.

Yadav (1996) indicated that majority of the women dairy farmers of DWCRA in Bareilly district of U.P. belonged to middle age category, illiterate, joint family, medium herd size, medium level of mass media exposure and extension agency contact and poor social participation. She also found that socio economic status, mass media exposure, extension agency contact, employment, attitude and knowledge level of women beneficiaries of DWCRA had positive and significant relationship with the programme effectiveness.

Wodi (1997) examined the role of women in livestock farming in the Igala communities in Kogi States, Nigeria, revealed that mostly respondents were between the ages of 31 to 45 years. Educational attainment by women lowered their involvement in livestock production. Flock size was small and about 54% of the respondents had not more than 12 farm animals. He suggested that the contribution of rural women in livestock production in Igalaland could be enhanced by a unified extension service system and by intensifying extension activities.

Gautum (1998) conducted a study on women in goat husbandry in Etawah district of Uttar Pradesh and reported that majority of the women involved in goat husbandry were young, maintained small flock size which was significantly correlated with involvement and overall employment status.

Bhagyashri (2002) conducted a study in Haveri district of Karnataka on participation of rural women in wool production and found that equal number (35.33%) of respondents belonged to young age (<35 years) and old age (>55 years) and 29.34 per cent were in the middle age (35-55) group. Majority of the respondents were illiterate (90.00%), followed by 8.67 per cent had education upto primary and only 1.33 per cent studied till high school. Nearly half of the respondents had medium (53.30%), followed by small flock size (35.50%) and only 11.20 per cent of the respondents possessed large flock size. Most of the respondents had less than 2.5 acres (36.00%), followed by 2.6 to 5.0 acres of land (29.33%), no land (24.00%), 5.7 to 10.0 acres (6.60%) and above 10 acres of land (4.00%).

Rao *et al.* (2002) conducted a study on dairy farming by landless women in southern states of India revealed the mean annual income from dairying ranged from a low of Rs.14,822/- in Andhra Pradesh to a high of Rs.47,820/- in Kerala. The overall mean annual income through dairying in all the states was Rs.23,286/-. Majority of the families (28 out of 57) were earning between 50 and 75 per cent of their income from dairying and in about 18 cases, the contribution was beyond 75 per cent. There was no single family which was deriving less than 25 per cent of its income from dairying.

Waldie and Ramkumar (2002) reported that livestock particularly, cattle have a strong role in poverty alleviation among the landless women in all the southern Indian states, although the degree and nature of their contribution varied. The approximate contribution of dairying to the total income ranges from 50 to 80 per cent in these families in all the four southern states.

Fulzele *et al.* (2003) observed that men had higher information needs with respect to improved dairy breeding practices in comparison to women, which could be attributed to their higher education level, social participation, urban contact and use of communication sources.

Savitha (2004) studied the role of rural women in animal husbandry in Dharwad district of Karnataka found that majority of the respondents (75.5%) were illiterates, followed by 10 per cent of them could only read and write. The respondents who attended primary school constituted 8.8 per cent and the rest of 5.6 per cent studied upto middle school.

Khin Mar Oo (2005) studied the knowledge and adoption of improved dairy management practices by women dairy farmers revealed that majority (59.17%) of women dairy farmers belonged to middle age group, whereas 22.5 per cent of them were young and 18.33 per cent were old and about 60 per cent were illiterates. Primary education was received by 22.5 per

cent of the respondents and 10.83 per cent of them studied up to middle school, while 4.17 per cent studied upto high school and only 1.67 per cent of the respondents studied upto college level.

According to national households survey (2006) of Uganda, Women headed households had low levels of cultivable land compared to male headed households. Among the women headed households, those headed by unmarried women had least land assets while the widowed had slightly higher land.

Kavitha and Reddy (2007) conducted a study in Warangal district of Andhra Pradesh to know personal and socio-economic characteristics of farm women. They found that more than half (55.83%) of the farm women belonged to young age category, followed by middle age (34.17%) and old age (10.00%) categories. More than half (54.16%) of the farm women were illiterates, while 11.67 per cent of them belonged to primary school category, 10.00 per cent to middle school category, 7.50 per cent to high school category and very few of them (5.00%) had college education. About 23.34 per cent of the respondents had small family (<3 members), 55.00 per cent had medium (4-6 members) and 18.33 per cent had large family (6-9 members) and only 3.33 per cent of the respondents had very large family size (>9 members).

Radio was the major source of information utilized by most of the respondents in the remote yak rearing areas of both Sikkim (53.33%) and Arunachal Pradesh (60%). However in Sikkim, television (23.33%) and newspaper (6.67%) were also utilized for information but their utilization was less. Whereas in Arunachal Pradesh, animal/yak fair (73.33%) and television (13.33%) were the second and third major mass media sources of information for the yak herdsman. Print media (newspaper, farm publication) and field tours/trips were found to be least source of information as responded by the herdsman due to the remoteness of this area and illiteracy among herdsman (Barman, 2007).

Subramanueswari and Reddy (2007) conducted a study in Chittoor district of Andhra Pradesh to know profile of rural women entrepreneurs involved in dairying. Study revealed that most (59.00%) of the dairy women farmers under small category had low level of dairy income, whereas 51.50 per cent from medium category and 50.00 per cent came from large category, had medium and high level of income from dairying, respectively.

Maurya (2010) studied in Bundelkhand region of U.P. on alternate dairy management practices in drought prone areas found that more than 50.00 per cent respondents belonged to landless and marginal groups, had low family education status. Respondents from medium large group (46.67%) had higher family education status.

Majority of the rural women (55.8%) belonged to the middle age group i.e. 30-50 years followed by 24.2 per cent and 20 per cent of the respondents who were in the young and old age group, respectively. About 64 per cent of the rural women had medium family size (4-6 members) and about 24.2 per cent families had large family size (7 and above) followed by 11.7 per cent families who had small family size consisting of 1-3 members. Majority (47%) of the respondents were not having formal education and were found to be illiterate. Eighty five per cent of the respondents had small herd size, while 11.7 per cent of the respondents had medium herd size and 3.3 per cent had large herd size. Radio remained the major source of mass media information utilized by most of the farm women in both the east (45%) and west districts (60%) followed by television among the rural women in the mountainous region of Sikkim (Subba, 2010).

Rathod *et al.* (2011) conducted a study on participation of rural women in dairy farming in Karnataka revealed that 55 per cent of rural women were middle aged followed by young (35%) and old age (10%) category, about 53.33 per cent were literates while 46.67 per cent of the women were illiterates. About the occupation, the study found that

agriculture (52.5%) was the major occupation of the family followed by laborers (28.33%). The remaining farm women were home makers (15%) and government job holders (4.17%). About 63 per cent of the families had low income followed by medium income category (35.83%) and high income group (3.34%). It was also observed that 33.33 per cent farm women families had marginal land followed by small farmers (28.34 %) and 20.83 per cent were landless and the remaining 18 per cent were large farmers. With regard to dairy herd size, 79.16 per cent families were in medium category while 12.5 per cent families had smaller livestock holding.

Sahu *et al.* (2012) studied the role of rural women in dairy activities in Bageshwar district of Uttarakhand, found that about 50 per cent of respondents belonged to middle age group i.e. 25-50 years with joint families (75.25%) and educated upto junior high school. About 60 per cent of the respondents families were marginal farmers with low family income of Rs. 20,000/- from dairying as an enterprise. More than half (51.25%) of the respondents had 1-2 animals for milk purpose and about 65 per cent had no membership in organization. Further, majority of the hilly women (61.25%) had less sources of information.

2.2 PRODUCTIVITY OF MILCH ANIMALS

Productivity of milch animals was non-significantly higher among high caste group, whereas employment status of schedule caste rural women was significantly higher than the other two categories. Average milk production (5.5 liters/day) and marketing of milk (3.77 liters/day) were higher among families of milk co-operative system as compared to in non milk co-operative system (3.29 & 1.31 liters/day, respectively). Home consumption of milk among non member co-operative families was slightly higher (1.98 liters/day) than in members of milk co-operatives system (1.78 liters/day). Positive and significant relationship ($p < 0.05$) was found between productivity of milch animals and family land holding, number of dairy animals, management orientation and attitude towards dairy forming and attitude towards productivity of rural women (Tripathi, 1991).

Khandekar (1992) in her study on tribal women in Madhya Pradesh reported that regardless of the location of villages, productivity of dairy animals was of medium level in majority of the household in the study area.

Raj Kamal (1993) conducted a study on livestock enterprise among tribals as antecedent to income, employment and productivity. The finding revealed that 79.76 per cent households had medium level of productivity in their milch goats. Moreover, households which had low productivity (13.10%) were more than those which had a high milk productivity (7.14%) in their milch goats. The dairy and goat milk productivity were significantly higher in families where spouses had more knowledge in dairy and goat farming, respectively.

Pathania *et al.* (2004) revealed a quantum improvement in the average calving interval and in milk yield per day of calving interval over time. The lactation length and dry period were lowered in graded up cows compared to non-descript cattle. The average milk yield per day of lactation length was higher in project area compared to non-project area. All economic traits improved with increase in exotic inheritance except for lactation length in Himachal Pradesh.

Chauhan and Kundu (2005) found that the average daily milk yield of lactating crossbred cows (7.00 litres) and graded Murrah buffaloes (7.06 litres) was significantly higher than that of lactating non-descript cows (4.07 litres) and local buffaloes (5.11 litres). The average per household daily labor utilization in all the dairy operations taken together was 5.62 man hours for the beneficiary households which were significantly higher than for the non-beneficiary households (4.9 man hours). The beneficiary households enjoyed an average of 3.77 times higher net income than the non-beneficiary households in a study conducted in Haryana State.

According to basic animal husbandry statistics report (2006) of the India, the average per day milk yield of crossbred cow, nondescript

cow, buffalo, and goat in Uttar Pradesh was 6.89, 2.464, 4.318 and 0.715 kg per animal respectively.

According to Sikka and Dixit (2006) the perception of rural women on buffalo husbandry in Jind district of Haryana found that 30 per cent respondents produced 1 to 5 kg milk, 40.00 per cent of the respondents could produce 5 to 10 kg milk and 30.00 per cent of the respondents produced more than 10 kg milk for sale.

Millogo *et al.* (2008) conducted a survey study in Burkina Faso and revealed that the owning of crossbred cows was related to higher daily milk yield per cow. However they need more extensive supplementation of diets for further improvement in milk production.

Subodh (2008) studied the self help groups for sustainable dairy development in gender perspective found that majority of the male members (59.62%) and comparatively less number of females (44.23%) belonged to medium category in terms of animals productivity (622-917 lit/year/animal) whereas about half of the females and 37.5 per cent males fell under low (326-621 lit/year/animal) milk productivity category.

Fifty eight per cent beneficiaries had high perception for productivity of crossbreeding practice as compared to 30 per cent non-beneficiaries. Production performance of cattle owned by the beneficiaries showed positive and significant ($P < 0.01$) relationship with employment generation with average lactation length, average lactation yield, per day milk yield and milk marketed while, average age at first calving and average calving interval were negatively but significantly related in cattle breeding interventions of BAIF (Rajesh, 2009).

Maurya (2010) studied in Bundelkhand region of U.P. on alternate dairy management practices in drought prone areas revealed the significant change was found in average lactation yield of dairy animals due to the effect of the drought (134 ± 17.25 in buffaloes, 720.42 ± 12.06 in

cattle and 74.88 ± 2.96 in goats) from normal period (1910 ± 20.15 in buffaloes, 969.79 ± 11.25 in cattle and 111.65 ± 4.82 in goats) periods.

Shinde (2011) conducted a study on socio-economic profile of dairy farmers in Solapur district of Maharashtra found that the average milk yield per day of lactating cows and buffaloes was higher in the irrigated region than in the non-irrigated region. The average productivity of cross breed cows was significantly higher than that of buffaloes. The average productivity during a lean season is substantially lower than during a flush season. The average productivity in cows during a flush season was as high as 16 litres in the non-irrigated region and 15.2 litres in the irrigated region.

2.3 PARTICIPATION, MODE OF ACQUISITION OF LIVESTOCK, ITS OWNERSHIP AND CONTROL

Patki *et al.* (2000) conducted a study on role performance of rural women in animal husbandry practices in Akola district of Maharashtra found that rural women preferred most of the animal husbandry practices but were comparatively less involved in breeding and other health practices due to lack of skill and scientific knowledge.

In Iraqi Kurdistan, 70 per cent of both female and male-headed households own livestock while female headed households on average owned twice as many animals as male headed households (Waite, 2000). The value of livestock in the female headed households is also considerably greater than that of livestock in the male headed households. In this society, where women do not engage in paid labor or other alternative income-earning activities, the care of livestock has traditionally been regarded as a 'female activity'.

Rao *et al.* (2002) found that most of the landless women purchased milking cows out of their own savings coupled with the earnings of their husbands, or depended on money-lenders, or purchased cows

through loans taken from the government or private agencies. Only very few (3 out of 57) had obtained the animals as a 'family gift' (i.e. a non-market channel).

Study on acquisition of livestock in Kenya revealed that only a few female-headed but most male-headed pastoral households purchased their animals from market. Women in Kenya appeared more able than men to access informal networks to obtain livestock. Results from a similar study in India, on the other hand, revealed that women had fewer informal or formal mechanisms for acquiring livestock than men (Heffernan *et al.*, 2003).

Oluka *et al.* (2003) studied the gender disparities in livestock ownership among the Teso Farming System region of Uganda found that women owning only 14, 21, 22, and 20 per cent, and men 62, 52, 39 and 48.5 per cent of cattle, goats, poultry and pigs, respectively. Women own fewer cattle but relatively more small stock than men. Children are more associated with small stock while joint ownership of all livestock species is a significant feature. Similar findings have been reported in the Gambia, where women own 67 per cent of goats and 52 per cent of sheep (Jaitner, *et al.*, 2001).

Badigar and Jutle (2004) in their study on participation of farm women in agricultural and animal husbandry activities reported that cent per cent of farm women had participated in animal husbandry activities like; grazing of animals, care of animal at the time of delivery, feeding colostrum to calves, taking out the animal and offering water to animals followed by 50 per cent of the farm women who participated in colostrum management, cleaning of cattle shed, boiling of milk, churning milk, cleaning of utensils used for milking and preparation of feed, cleaning of cattle shed, collection and disposal of dung. Least per cent of farm women participated in taking animal for artificial insemination, preparation of special feed at home and preparation of special feed for the sick animals.

Savitha (2004) conducted a study on role of rural women in animal husbandry in Dharwad district of Karnataka revealed that high participation was seen in regular activities in all the three enterprises, viz. dairy (88.70%), poultry (100%) and goat rearing (83.60%).

About 80 per cent of female of Jind district of Haryana performed operations like milking, watering and feeding of animals, while 66.40 per cent of the women were involved in activities of fodder harvesting, heat detection, health management and cent per cent of the women involved in cleaning shed, dung disposal and animal care at calving (Sikka and Dixit, 2006).

According to Sekhar (2007) the women's participation in the rural economy is significant. In Uttarakhand, young men generally migrate to the plains in search of employment, whereas women are left behind to cultivate the land and take care of the children and the older generation.

Torkelsson and Tassew (2008) conducted a study in the Western Shoa region of Ethiopia found that women in female headed households own fewer livestock than men in male headed households.

Mishra *et al* . (2008) conducted a study on gender participation and role of women in livestock management practices in Bundelkhand region of U.P. They found that involvement of women in livestock management practices varied depending upon the type of management practices. Most of the activities like collection of fodder (88%), cleaning of animals and sheds (67%), feeding animals (79%), milking (46%) and traditional healthcare (67%) were performed by women. Milk disposal (85%), sale (96%), purchase of animals (100%), vaccination (100%) and breeding of animals were mainly done by men. For watering, 62% of men were involved. Because of drought and scarcity of underground water in Bundelkhand region, women have to fetch drinking water from wells situated in low lying areas from long distances.

In pastoral societies, women frequently own fewer animals than men, however, livestock assets are generally more equitably distributed between men and women than are other assets like land (Flintan, 2008).

Men and women are also likely to differ in the types of breeds, they own within a given species, with men more likely to have improved animals than women in dairy areas of Kenya while a higher percentage of female-headed households than male-headed households own local cattle, the reverse was observed for (higher-yielding, genetically improved) exotic cattle, with 63 per cent of male-headed households owning exotic cattle compared to 49 per cent of female-headed households. These results are consistent with those from Rwanda, where 45 per cent of male-headed households owned exotic cattle compared to 32 per cent of female headed households (EADD, 2008). Results from the same study showed that, in Rwanda and Uganda, female-headed households also owned significantly fewer local cattle (on an average of 4.2 and 5.1 head per household, respectively) than did male headed households.

Deere and Twyman (2009) conducted a study in Nicaragua revealed that women own about 10 per cent of working animals and cattle but between 55-65 per cent of pigs and poultry. The overall value of male owned livestock was found to be 6½ times that owned by females. A similar situation is observed in Kenya by Kossoudji and Mueller (1983), who found that in value terms, male headed households own three times as much cattle as female headed households, while the comparable ratio for small animals is lower.

Narmatha *et al.* (2009) studied on level of participation of women in livestock farming activities in Namakkal district of Tamil Nadu revealed that majority of the respondents were actually doing the livestock farming activities than just supervising. Further, the actual doing of the work was more in management (85.5%) followed by feeding (79.66 %), health care (68.66%) and breeding (61.32%) whereas the supervision role was high in marketing (29%) and miscellaneous (17.32) domain.

Dillon and Quinones (2009) estimated the value of men's livestock holdings to be about 2 times that of women's in 2008 in northern Nigeria. Furthermore, even when women enjoyed joint ownership of large animals, but not necessarily had access to them, as was found for Indian women and the use of oxen (Chen, 2000 and Sharma, 1980).

In pastoral areas of Ethiopia, a study documented that women purchasing bulls (Rubin *et al.*, 2010) while in mixed crop-livestock systems men and women both own cattle, goats and sheep, though men own more (Yisehak, 2008).

Nosheen *et al.* (2010) studied on an assessed the participation of rural women in livestock management and their training needs in Potohar region of Pakistan state revealed that more frequently carried out activities by rural women were; livestock management, animal production, protection and poultry husbandry. Rural women were interested to get their training in livestock management, animal production, protection, poultry husbandry and marketing of animals to boost up the livestock productivity.

Rathod *et al.* (2011) conducted a study on participation of rural women in dairy farming in Karnataka revealed that women participation was maximum in caring of pregnant animals (91.66%) followed by taking animals for pregnancy diagnosis (90.83%). Ninety per cent women involved in milking while 89.16 per cent women cared for newborn or young animals. Farm women actively involved in cleaning of animal sheds (89.16%), feeding the animals (87%) and disposal of cow dung (86.66%). Least participation was found in farm record maintenance (52.5%) and getting loans or credits from the banks (49.16%).

Antwal *et al.* (2012) conducted a study on gender roles in livestock development activities in Yavatmal district of central zone of Maharashtra revealed that independent participation of rural women was found negligible, whereas independent participation of rural men was noticed in procuring

fodder, procuring and repayment of credit/loan, growing fodder and engagement of labor. Excreta management both fresh and retention of produce for household, consumption, care of livestock/poultry shed management and care of sick animals, were the areas of joint participation of rural women with other female and joint participation of rural men with women. Joint participation of rural men with male was also recorded in breeding of animal, grazing of animal and marketing of produce.

Tanwar (2012) studied the role of farm women in different dairy activities in Jaipur district of Rajasthan found that 65 per cent works related to care after parturition and 36.67 per cent works related to attending the animals at the time of parturition performed by women. Other activities like taking animals for artificial insemination/natural service, and pregnancy diagnosis, sale and purchase of animals and getting the services of veterinarian during dystokia were less performed by farm women. These activities were performed by male members of the family. Farm women involvement in feeding practices ranged from 76.25 to 96.67 per cent. The farm women actively involved in preparing the cakes from dung (100%), cleaning of animal shed (84.58%), spraying of litter in winter season in the shed (81.25%), dispose off dung (77.08%) and protection of animals from adverse climatic conditions(47.08%), whereas only 12.92 per cent involvement was in construction of animal shed. Farm women performed as high as 92.5 per cent milking of animals followed by preparation of milk products i.e. ghee and lassi (91.67%), washing of milk utensils (84.58%) whereas sale of milk to dairy cooperatives was less performed (14.58%) in the study area. The farm women actively participated in care of newly born calf (69.58%), care of sick animals (66.07%) and care of pregnant animals (59.58%).

2.4 INPUT DELIVERY SYSTEMS AND ACCESSIBILITY TO VARIOUS LIVESTOCK RELATED SERVICES

FAO surveyed the extension organizations covering 97 countries in 1988-89 revealed that only 5 per cent of all extension resources were

directed at women. Moreover, only 15 per cent of the extension personnel were female (FAO, 1993). The access of female farmers to extension services and their preference for extension agents of a particular gender differed by country.

Goetz and Gupta (1996) reported that on an average, women retained full or significant control over loan use in only 37 per cent of all cases while Chowdhury (2009) reported that credit to women from the Grameen Bank, was positively and significantly correlated with male- but not female-managed micro enterprises.

In Tanzania, 40 per cent of women farmers preferred to work with female extension agents and 51 per cent of the women interviewed mentioned their wish to receive information on small ruminant production. Almost all the women (94%) pointed out that they could attend demonstrations and training courses only if these were conducted in their villages (Due *et al.*, 1997).

Rangnekar (1998) emphasised on the need for redesigning training and extension interventions to suit the requirements of women. She recommended that these interventions should be practical, useful in the short term, use of audiovisual material, and be made in the afternoons and close to the women's homes. She also recommended for employing women as training and extension officers for technology dissemination among women farmers.

Doss and Morris (2001) found a little difference in contact with extension agents between male and female farmers from male headed households, however female farmers in female headed households have much less contact in Ghana. They also found that women farmers were willing to speak to agents of either gender.

Dolan (2004) in Uganda found one of the most prominent barriers was lack of financial services. Nearly all female headed households

reported a desire to expand agricultural activities but lacked the money to purchase land, inputs such as seeds, fertilizer, and pesticides and/or to hire in labor.

Hussain *et al.* (2004) conducted a study on assessment of the impact of a livestock training course in Kotli, India found that all the women who had received gender sensitive training thereafter used their new knowledge, particularly with respect to vaccination of animals.

Kenyan women pastoralists were paying more as individuals than do men for information, whether for livestock extension materials for animal-disease warnings or for livestock market updates particularly in the informal economy groups. Women producers were better than male individuals to access information and services (Ndungu *et al.*, 2004).

Women have developed their own small credit systems in many countries. However credit funds and revolving savings of women's groups are common throughout Africa. Members of a group each save a certain amount of money monthly, which is then granted in turn to each of the women as a loan, normally at no interest. Most of these loans go towards non-income-earning activities (Place *et al.*, 2004).

Budaka *et al.* (2005) conducted a study in the Taurus mountain villages in Turkey found that most women farmers had little access to information about animal production through public extension services. Similar findings have been documented in Cameroon, Ghana and Madagascar by Salman *et al.* (1999) in Pakistan, Teufel *et al.*, (1998) and in the Gambia by Jaitner *et al.* (2001).

Among Maasai pastoralists in southern Kenya, women's access to extension services was restricted by cultural as well as time constraints. Women typically rely on their husbands for information, but delivering extension messages through women's groups was also found effective (Kimani and Ngethe, 2007).

In developing countries, men generally have greater and easier access to credit than do women, whose lack of collateral makes them appear not credit worthy. Women dairy operators in Kenya, typically lacked secure titles to property, which prevented them from obtaining credit from formal financial institutions. A survey in Kenya, Rwanda and Uganda showed that significantly more men than women had applied for loans from financial institutions or local cooperatives (EADD, 2008).

Smallholder poultry development project demonstrated the important role that women's groups play in accessing credit in Bangladesh, Benin, Senegal, Burkina Faso and Togo. This project took a holistic approach involving capacity building, organization of women into groups, and farmer field schools aimed at giving poor illiterate women farmers and local food vendors the knowledge required to benefit from collective action (Riise *et al.*, 2008).

Extension service agents tend to approach male farmers more often than female farmers because of the misperception that women do not farm and that extension advice will eventually "trickle down" from the male household head to all other household members. Moreover, extension services are often directed to farmers who are more likely to adopt modern innovations with sufficient resources in well-established areas. Women do not necessarily possess such resources and may therefore be bypassed by extension service providers (Meinzen-Dick *et al.*, 2010).

Subba (2010) found that majority of the respondents (47.5%) preferred to have loans and credit from Self Help groups. About 41.7 per cent of the rural women preferred to have loans and credit from their friends and peers followed by 10.8 per cent of the respondents preferred money lenders for the purpose.

Kolekar (2011) conducted a study on effectiveness of contract dairy farming in Maharashtra. He found that 16.67 per cent contract farmers were having access to extension services. The information perceived was

useful for improving the milk production, better access to appropriate technologies of milk production and in decision making process, thus extension service acted as stimulus for clean milk production before contract farming. While 3.3 per cent contract farmers agreed that dairy management practices such as housing, breeding, heeding and weeding etc. were improved due to access to extension services. Cent per cent contract farmers responded that status of animal health care system, feed and fodder management, dairy management practices such as housing, breeding, heeding, weeding improved and regular follow up under contract farming due to accessibility to extension services.

Mirajkar and Kumar (2011) conducted a study among the livestock owners of Sangli district in Maharashtra to assess the preference of the livestock owners towards a particular veterinary service provider. Majority of large farmers preferred state veterinary services and cooperative veterinary services, where it had strong presence. Cooperative veterinary service can be a good alternative to the state veterinary services and the private veterinary service providers are still not preferred in the rural area.

Ahuja *et al.* (2012) studied on farm women's access to resources and participation in decision making in two states of Bihar and Jharkhand. The findings showed that their access to assets like; land, credit, investment, machinery, livestock and production inputs viz: fertilizer, labour, pesticides and seeds were limited in both states. It has been observed that less than 5.00 per cent women had access to these resources in spite of their contribution in farm activities.

Kumar *et al.* (2012) conducted the study in ten villages of two district of Odisha state to understand the ownership and control over resources and women's role in marketing of livestock products. The study revealed that only 2.3 per cent of women had complete control over capital as compared to 57.7 per cent of men, while joint control was 40.00 per cent. Regarding access to credit, 10.1 per cent women had access to it, men

(50.6%) and jointly 39.3 per cent. When liquid assets were considered, it was observed that only 8.8 per cent of women had access to it compared to 58.4 per cent for men and 32.8 per cent had joint access.

2.5 CONSTRAINTS IN TECHNOLOGY ADOPTION IN SMALL SCALE DAIRY PRODUCTION SYSTEM

Thorat *et al.* (1994) analysed the constraints faced by the dairy farmers. Study revealed that high cost of feed and fodder was the major constraint faced by the dairy farmers. Inadequate supply of fodder and feed to the animals, lack of knowledge regarding preparation of silage and scientific feeding of animals were the other constraints perceived in technology adoption.

Saxena (1996) found that problems visualized by members of women cooperatives to start dairy business included; lack of infrastructural facilities (52.67%), finance (20.66%), not getting support from family (15.33%), credit problem (6.67%) and problem of marketing of a produce (4.67%).

Shalander *et al.* (2000) identified and prioritized nine constraints related to livestock breeding and management in Bhola village of Khurda district in Orissa. The constraints in order of priority were; lack of availability of good milch cow, repeat breeding, poor availability of good males, artificial insemination problems and non availability of good sheep breeds etc.

Keshava and Mandape (2001) analysed the problems in a prospects of dairy farming in Muzaffar district of North Bihar. They found that dairy farming in the area was characterized by inadequate herd size, low milk productivity and poor feeding practices. The major problems faced by farmers in dairy farming were; proneness of animals to diseases, costly cattle feed and unavailability of veterinary facilities and irregular milk market.

Manivannan (2003) conducted a study in Thanjavur district of Tamil Nadu on management efficiency of dairy farmers identified major constraints specific to the localities were; delay in payment for milk

supplied to cooperative/middlemen in peri-urban and rural areas, high cost of green fodder in urban areas and low availability and high cost of dry fodder in urban and peri-urban areas.

Teso Farming System region of Uganda found the major constraints perceived by women in small stock livestock production included; poor access to extension services, disease prevalence and lack of improved livestock breeds. The greatest concern of men was the prevalence of animal disease, which reduced animal productivity and increased the cost of animal rearing (Oluka *et al.*, 2003).

According to Savitha (2004) majority of the women (93.33%) involved in dairy expressed the non-availability of fodder as their main problem, followed by water scarcity (90.00%), low cost of milk (83.33%) and costly fodder/feed/concentrate (63.33%). Very few of them (13.33%) expressed frequent attack of diseases as a problem. In case of poultry, cent per cent of the respondents had the problem of frequent outbreak of the diseases, followed by low price of the eggs (96.66%) and high death rate of birds (86.60%). Only 20.00 per cent of the respondents expressed lower egg consumption rate of rural people as their problem. In case of goat rearing all the respondents had the problem of non availability of pasture for grazing followed by frequent outbreak of diseases (86.66%) and costly fees for veterinary doctor (70.00%) and costly veterinary medicines (63.30%).

Sharma (2005) found major constraints in the growth of dairying in Haryana as lack of knowledge regarding silent heat, high cost of dry fodder, lack of knowledge about feeding practices, lack of knowledge of milk record keeping and cost of treatment.

According to Subodh (2008) lack of remunerative price for sale of milk and milk products, improper supply and high cost of veterinary services and medicines as well as lack of training regarding scientific dairy husbandry were the severe problems perceived by women SHGs

members. Other constraints were; lack of knowledge in preparing in balance ration based on available resources, unorganized market and lack of transport facilities for farm produce, lack of storage facilities for milk and milk products, lack of knowledge on scientific dairy husbandry, unavailability of green fodder round the year, unavailability and high cost of concentrate and lack of infrastructure.

Yadav *et al.* (2008) reported that the most serious constraints in adoption of scientific dairy farming practices in Haryana were; poor success rate of A.I., preference of food crops, less technical knowledge about vaccination schedule and deworming.

Patil (2009) conducted a study on constraints faced by the dairy farmers in Nagpur district. found that 68.00 per cent of the respondents, revealed inadequate knowledge of diseases, their prevention and control as their constraint, followed by 60.89 per cent respondents who revealed constraints as non-availability of A.I. facility and timely veterinary services; and 56.89 per cent stated their constraint as non-availability of veterinary hospitals.

Devaki and Senthilkumar (2011) suggested that the farm women involved in livestock enterprises encountered with numerous constraints in their day-to-day affairs. The important constraints were; high cost of animals, feed and medicine (94.00%), inadequate/ non-availability of credit (88.00%), lack of transport facilities(79.00%), non-existence of regulated market (42.00%), exploitation of middle men (33.00%) and lack of veterinary aid (22.00%).

According to Umar and Kumar (2011) various constraints perceived by dairy farmers in adopting improved dairy farming practices in Madhubani of Bihar state were; ill equipped A.I. services (82.66%), repeat breeding (74.66%) and lack of pedigree bull for natural services(69.33%), followed by low genetic potential of local animals (65.33%), poor availability

of resources to maintain superior breed of milch animals (61.33%) and poor knowledge of A.I. services (58.66%). The main constraints among feeding practices were; inadequate knowledge about proper feeding of dairy animals (81.33%) and under feeding due to limited financial resources (78.66%). In management and health care aspect the major constraints were; ill equipped veterinary hospital (84.00%), lack of awareness and knowledge about the information of vaccination, deworming (80.00%) etc. Other constraints were; lack of knowledge in making value added milk product, lack of dairy cooperative societies and lack of loan facilities perceived by dairy farmers.

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*Research
Methodology*

Chapter-3

Research Methodology

The main purpose of this chapter is to deal with various methods and procedures used with respect to the selection of locale of the study, sampling design, tools of data collection, variables and their empirical measurements and statistical methods employed for the analysis and interpretation of the data collected. It is presented under following subheads:

- 3.1 Research design
- 3.2 Sampling procedure
- 3.3 Theoretical orientation
- 3.4 Tools for data collection
- 3.5 Statistical methods for analysis of data

3.1 RESEARCH DESIGN

Survey and focus group technique were used for study purpose.

3.2 SAMPLING PROCEDURE

3.2.1 Locale of study

The present study was carried out in the Bareilly district of Uttar Pradesh which has been selected purposively because of the familiarity of the researcher with the local language, customs and culture which helped in building up rapport with the respondents.

3.2.2 Background information of Bareilly district

The district Bareilly is situated at 28°22'N latitude and 79°22'E longitude in Tarai region of Uttar Pradesh. It is surrounded by Nainital in north Pilibhit and Shahjahanpur in east, Badaun in south and



Fig.1 : Location of Uttar Pradesh in India



Fig.2 : Location of Bareilly in Uttar Pradesh



Fig.3 : Location of Blocks in Bareilly district

- Alampur Jafarabad
- Bhojipura
- Bithri Chainpur
- Faridpur
- Nawabganj

Rampur in west. The total geographical area of the district is around 4120 square kilometers. Soil texture of Bareilly district varies from sandy loam to loamy sand. The soil of this district is sandy loam, loam and loamy sand. The clay and silt soils are almost absent in this district, however, coarse sand is available in the river banks. The climate of this district resembles to that of tropical regions with hot summers and cold winters. The temperature goes up to 45°C during summer and falls to 2.7°C during winter. The region receives 1107 mm normal rainfall and most of it is received during the monsoon season stretching from June to September.

The district constitutes 6 tahsils, 15 development blocks, 15 nagar panchayat, one nagar nigam and one cantonment. These tahsils cover 1324 gram sabhas, 144 nyay panchayat and 2072 villages. The total human population of this district is 898,167 of which male and female are 477,438 and 420,729 respectively. Majority of the population live in rural areas, who are mostly engaged in agriculture, animal husbandry, small scale and cottage industries and agricultural labor. The sex ratio is 883 females per 1000 males and density of the district is 1,084 persons per square kilometer. Average literacy rate is 84 per cent out of which male and female literacy are 69.47 and 50.35 per cent respectively. The total cattle and buffalo population in Bareilly district is 7,23,095 out of which rural, semi-urban and urban area has 67,29,49, 27,318 and 22,828 heads, respectively.

3.2.3 Selection of blocks

Bareilly district consists of 15 community development blocks namely; Baheri, Shergarh, Damkhoda, Kyara, Bhojipura, Fatehganj West, Mirganj, Ram Nagar, Majhgawan, Alampur Jafarabad, Bithri Chainpur, Nawabganj, Bhadpura, Bhuta, Faridpur. Out of 15, five blocks namely; Alampur Jafarabad, Bhojipura, Bithri Chainpur, Faridpur and Nawabganj were selected randomly. From each of the selected blocks 10 adjacent villages were selected to make a cluster. Thus 50 villages were selected and made 5 clusters consisting 10 villages in each cluster.

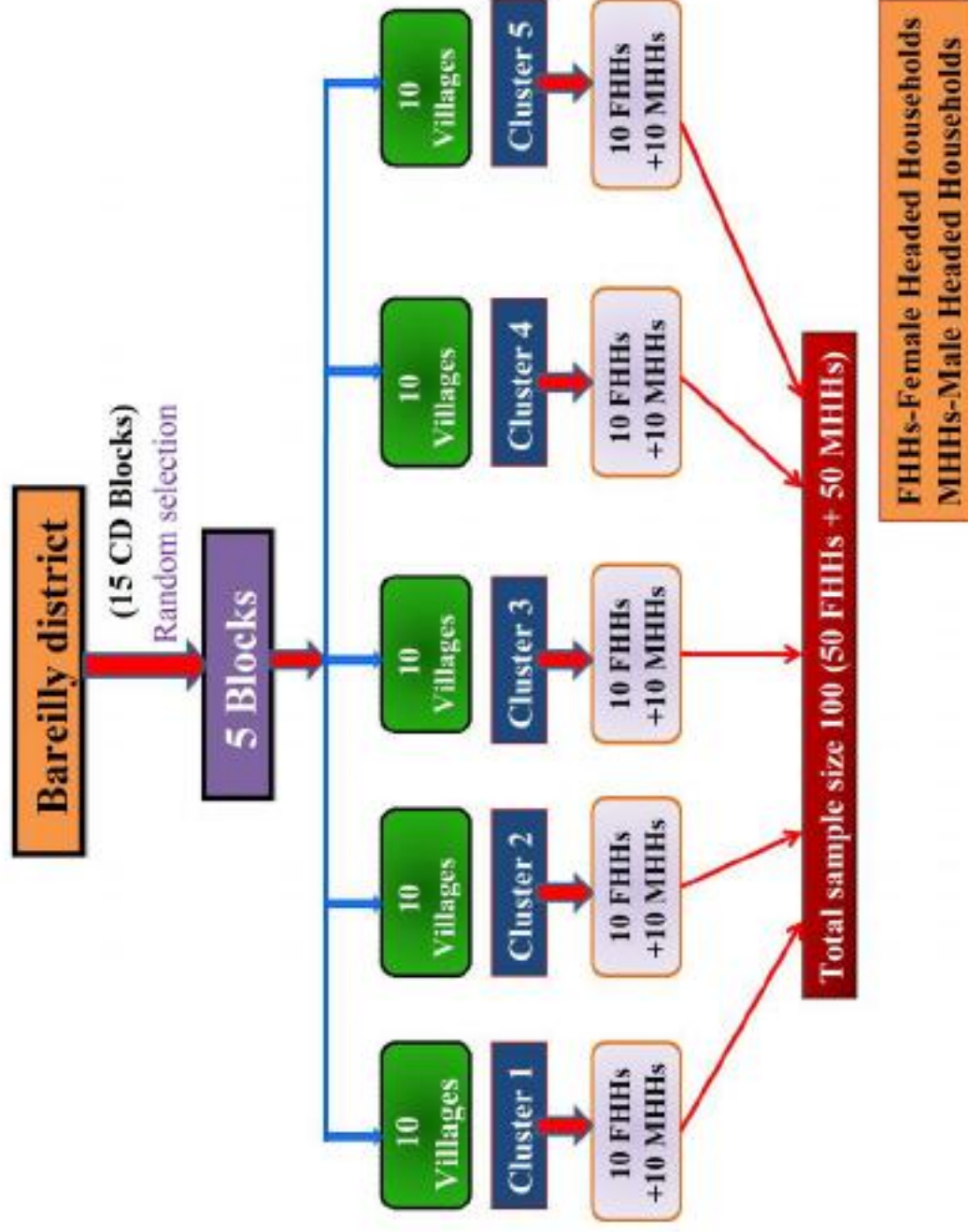


Fig. 4: Diagrammatic representation of sampling procedure

3.2.4 Selection of respondents

From each of the five clusters, ten female headed households were selected randomly after preparing a comprehensive list of such households and using focus group technique. An equal number of male headed households were also be selected from the same clusters randomly. Thus from each cluster, twenty households (10 female headed households + 10 male headed households) were selected. Final data were collected from hundred distinct households (50 female headed + 50 male headed) from five different clusters comprising fifty villages from five different blocks of Bareilly district.

3.3 THEORETICAL ORIENTATION

It describes broadly the concepts and variables used in the present study for empirical investigation

3.3.1 Variables and their measurement

Variables along with empirical measurement are given in Table 3.1.

Table 3.1: List of the variables selected under the proposed study

Sl.No.	Variables	Measurements
X Independent variables		
x_1	Age	Chronological age
x_2	Caste	Through schedule
x_3	Marital status	Through schedule
x_4	Family education status	Family education status Index (Ray,1967)
x_5	Family size	Through schedule
x_6	Family land holding	Through schedule
x_7	Livestock holding and mode of acquisition	Through schedule
x_8	Major occupation	Through schedule
x_9	Annual household income	Through schedule
x_{10}	Input delivery system and accessibility to various services	
x_{10}	(i) Access to extension services	Through schedule

x_{10}	(ii) Access to training	Through schedule
x_{10}	(iii) Access to animal health services	Through schedule
x_{10}	(iv) Access to market	Through schedule
x_{10}	(v) Access to credit	Through schedule
x_{11}	Gender role in livestock production	Through schedule
x_{12}	Ownership and control over livestock	Through schedule
x_{13}	Information seeking and sharing behavior	Through schedule
x_{14}	Mass media ownership and frequency of use	Through schedule
x_{15}	Constraints in technology adoption	Through schedule

Y Dependent variable

y_1	Productivity of milk	Milk yield index, Yang, 1980
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3.3.2 Operational definitions of terminology and variables used in the proposed study

Female headed households: Female headed household was operationalized in the study as the one in which female was the major provider and/or protector, carrier, bearer and decision maker and assumed all the responsibilities in the household. Female headed households were selected wherein adult male members were not present due to migration, widowhood, separation or desertion, divorce and women remained single by choice or compulsion.

Small scale dairy production system: It referred to the system where livestock played a central role as a source of food, income and critical inputs for livelihood. Small scale dairy production meant rearing of 5-6 goats or 1 or 2 cattle or buffalo for milk purpose.

Age: It was one of the basic characteristics of an individual linked with his maturity, physical well being, productivity level and work efficiency. Age was operationalized as the number of years completed by the respondent at the time of enquiry or investigation. In the present study, the respondents were placed into three age groups viz. young (<25 years), middle (25-50 years) and old (>50 years).

Caste: According to Lundberg et al., Caste is a social category, whose members are assigned permanent status within a given hierarchy and whose contacts are restricted accordingly. In the present study, the respondents were placed into three categories of caste viz. schedule caste, other backward and general.

Marital status: Referred as demographic parameter indicating a person's status with respect to marriage, divorce, widowhood, singleness, etc. In the present study, the respondents were placed into four categories of marital status viz. married, unmarried, widow and divorced.

Family education status: It referred to the academic qualifications acquired through formal schooling by all the members of the family. The years of schooling of different family members of the respondents were quantified as illiterate (0), who can read (1), members can read and write (2), primary (3), upto middle school (4), high school (5), intermediate (6), graduate and above (7). Overall education level of the family was computed by using the formula given by Ray (1967).

$$\text{Family education status index} = \frac{\text{Total educational score of the family}}{\text{Total number of eligible members in the family}}$$

Finally, respondents were categorized as low, medium and high on the basis of equal class intervals between minimum and maximum scores obtained by them separately for female and male headed households.

Family size: It referred to the total number of family members living under the same roof at the time of enquiry and classified into three groups viz. small (1-3 members), medium (4-6 members) and large families comprising more than 7 members on the basis of lowest and highest number of members present in each family.

Family land holding: It referred to the total land owned by rural family. It includes own land, either self cultivated or on shared cropping or leased out. The respondent were categorized into three groups

according to land holding as landless, marginal (up to 2.5 acres), small (above 2.5-5.0 acres) on the basis of equal class intervals between minimum and maximum scores and expressed in terms frequency and percentage accordingly.

Livestock holding: It referred to actual number of cows, buffaloes, sheep, goat, and draft animals owned by respondents at the time of interview. All the animals owned by the respondents either large or small were assigned weightage and converted into cattle equivalent score using method of Gadgil (1947), National Accounts Statistics (1961) and Lalwani (1981). The respondents were then categorized as small, medium and large size of livestock owned on the basis of equal intervals between maximum and minimum achieved scores.

Mode of acquisition of livestock : Mode of acquisition of livestock means, channel through which men or women acquired livestock e.g. as gift, inherited from family members, purchased from market/village, rearing/return and used combination of modes and expressed in the frequency and percentage accordingly.

Major occupation: Major occupation referred to respondent's principal work or business especially as means of earning. It was operationalized as the main source of income of the respondents and categorized into crop farming, livestock rearing, labors, government and private services.

Annual household's income: Annual income of respondents referred to the total income of a family earned from all sources. The respondents were then categorized as low, medium and high income groups on the basis of equal intervals between minimum and maximum achieved income in a year.

Input delivery system: It was operationalized as the various input delivery systems/agencies and their distance, which provided timely

critical inputs required for livestock production, inputs like green fodder seeds, dry fodder fertilizer, concentrate feed, treatment of sick animals, deworming, vaccination against contagious diseases, facilities for A.I., institutional and noninstitutional financing.

Access to extension services: It referred to the accessibility of various extension services to the respondents for the management of their animals in the nearby area of the study.

Access to training: It referred to the accessibility of various training institution both on and off campus to the respondents for better management of their livestock.

Access to animal health services: It referred the access to various animal health delivery services which were available to the respondents in the nearby area of study. It included all those services & provisions made by animal health providers under organized and unorganized sector to keep the animal healthy & productive through bringing down morbidity & mortality of animals and expressed in frequency and percentage accordingly.

Access to market: It referred to the accessibility of market to the respondents for purchasing inputs related to for the dairy production and for disposal of milk and milk products in the nearby area of the study. Frequency and percentage of each category was calculated accordingly.

Access to credit: It was operationalized as the extent of accessibility of credit and their preferred institution for availing it for the livestock and related activities. It included banks, co-operatives, friends, money lenders, SHGs etc. and expressed in frequency and percentage accordingly.

Gender role in livestock production: It referred to the extent of involvement of the women and men heading the households in various

management, feeding, breeding, health care and market related activities of the dairy animals. Extent of involvement of each activities was classified as independent, joint and exclusively by other with score of 3, 2 and 1 respectively.

Ownership and control of livestock: Ownership was the state of owning livestock exclusively by the respondent. Ownership was categorized in terms of single, joint and no ownership with the respective scores of 3, 2 and 1. Whereas control includes the extent of freedom, a respondent had over selling and purchasing of livestock and its produce which were were categorized into complete and partial control.

Information seeking behavior: It was operationalized as the extent of search of different sources for various livestock related information by the respondents. The data were collected in three point continuum scale viz. always, sometimes and never with respective scores of 3, 2, 1 and then results are expressed in frequency and percentage accordingly.

Information sharing behavior: It meant as the sharing of information with different persons with in the farming community after receiving any information related to small scale dairy production. Information sharing behavior of each respondents was measured on three point continuum scale viz. always, sometimes and never with respective scores of 3, 2 and 1 with friends & relatives, neighbours, gram pradhan, progressive farmers, local leaders, extension personnel, dev. Dept. officers, university/institute personnel, private agency staff and NGOs.

Mass media ownership and frequency of use: It referred to the mass media owned by an individual and degree to which each mass medium was used by individual respondent and expressed in frequency and percentage accordingly.

Constraints in adoption of technologies: It referred to the various problems and hurdles faced by women and men heading their households

Table 3.2 : Computation of Milk Yield Index

Animals	Milk yield Lt. / Animal per lactation		No. of Dairy animals	Respondents milk yield (3) X 100/ Av.yield (Col.2)	Product number of dairy animals (Col.4 X Col.5)
	Av. Milk production of lactating animals	Respondent/ livestock owner			
(1)	(2)	(3)	(4)	(5)	(6)
A. Cows					
1. Crossbred (N=11)	781.25				
2. Desi cows (N=20)	430	347	1	80.69	80.9
B. Buffaloes					
1. Improved buffaloes (N=3)	1051.25				
2. Desi buffaloes (N=34)	767.7	900 (775.5) 651	2	101.01	202.02
C. Goats (N=37)					
	103.17	120 75 (97.5)	2	94.60	189.2
Total			5		472.12

$$\begin{aligned} \text{Milk yield index} &= \frac{\text{Total(6)}}{\text{Total(4)}} \\ &= \frac{472.12}{5} \\ &= 94.42 \end{aligned}$$

in the adoption of technologies related to small scale dairy production system. Respondents were asked to mention the level of constraints on three point continuum which they consider as major constraint, minor constraint and not a constraint, with respective scores of 3, 2, 1 and these were ranked according to their total obtained scores by the respondents separately for female and male headed households.

Productivity of milk: Productivity of milk was conceptualized as a manifestation of obtaining total fluid milk from per unit of dairy animals including cattle, buffalo and goat through the adoption of scientific dairy farming technologies, available man power and financial resources. It was measured by Livestock Production Index (Milk Yield) as recommended by Yang (1980). According to him, milk production index represents the average milk yield of dairy animals on a household as compared with average milk yield of the region. For calculating the milk production index for milch animals of a particular household, the average yield of milch animal of the region was determined. Then, by dividing the average yield per animal on the particular household by the average milk yield of individual animal in the region, a percentage which then was multiplied by 100, gave the milk index for individual animal.

Example

As an example, the procedure followed in computation of milk yield index is shown in Table 3.2.

Finally, respondents were categorized as low, medium and high productivity scores of milch animals on the basis of equal class intervals between minimum and maximum scores obtained by them.

3.4 TOOLS FOR DATA COLLECTION

3.4.1 Development of interview Schedule

An interview schedule was developed on the basis of objectives by incorporating all the variables required for the study. The required

information for the schedule was collected by going through the relevant available literature on the subject and in consultation with expert in the area. Before using the final interview schedule, with the sampled respondents pre-testing of the schedule was conducted with 20 non sample respondents separately for female and male headed households in non sample area.

3.4.2 Method of data collection

Data were collected personally through final interview schedule from the selected respondents separately from female and male headed households supported with observations, interaction etc.

3.5 STATISTICAL METHODS FOR ANALYSIS OF DATA

Data were compiled, tabulated and analyzed keeping in view the objectives of study using suitable statistical packages. Comparisons were made on the selected socio-economic and communication parameter, milk productivity, roles, availability of inputs & its accessibility and control of resources between the female and male headed households in small scale dairy production system using frequency distribution, percentage, mean, t test, chi square test, correlation analysis etc.

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*Results
and
Discussion*

Results and Discussion

This chapter deals with the socio-economic and communication profile of respondents, differences in the input delivery systems, their accessibility to extension services, trainings, animal health services, credit, market and gender role in livestock production, ownership and control over livestock, constraints in adoption of dairy technologies and productivity of milch animals owned by selected female and male headed households and relational analysis between participation in livestock management practices and socio-economic variables of the respondents.

4.1 PROFILE OF THE RESPONDENTS

4.1.1 Socio-economic characteristics of the respondents

The characteristics of the respondents may affect their involvement in rearing of dairy animals in a given family which ultimately generate the income and employment among the family members and in turn help in sustaining the income generating activity. It was therefore, intended to study the age, religion caste, family size, marital status, family education status, land holding, livestock holding and mode of its acquisition, major occupation and annual household income through livestock.

4.1.1.1 Age

The working capacity at farm and functioning in the families or group is influenced by the age of the respondents. The experience gained in livestock enterprise is commonly reflected through age.

Table 4.1: Socio-personal and economic characteristics of sampled households

Socio- personal & economic variables	Households		Overall (N=100)
	Female Headed (n=50)	Male Headed (n=50)	
Age			
Young (<25 years)	03(6.00)	07(14.00)	10(10.00)
Middle (25-50 years)	35(70.00)	36(72.00)	71(71.00)
Old (>50 years)	12(24.00)	07(14.00)	19(19.00)
Religion			
Hindu	49(98.00)	50(100.00)	99(99.00)
Muslim	01(2.00)	-	01(1.00)
Caste			
Schedule caste	01(2.00)	05(10.00)	06(6.00)
Other backward class	46(92.00)	40(80.00)	86(86.00)
General	03(6.00)	05(10.00)	08(8.00)
Family Size			
Small (upto 3 members)	17(34.00)	02(4.00)	19(19.00)
Medium (4-6 members)	33(66.00)	37(74.00)	70(70.00)
Large (>6 members)	-	11(22.00)	11(11.00)
Marital status			
Unmarried	-	-	-
Widowed	35(70.00)	-	35(34.00)
Divorced	-	-	-
Married	15(30.00)	50(100.00)	65(65.00)
Family education status (score)			
Low (1-2.75)	31(62.00)	14(28.00)	45(45.00)
Medium (2.75-4.5)	14(28.00)	28(56.00)	42(42.00)
High (>4.5)	5(10.00)	08(16.00)	13(13.00)
Land holdings			
Landless (no land)	17(34.00)	06(12.00)	23(23.00)
Marginal (upto 2.5 acres)	31(62.00)	40(80.00)	71(71.00)
Small (2.5-5 acres)	02(4.00)	04(8.00)	06(6.00)
Major occupation			
Laborer	07 (14.00)	03(6.00)	10 (10.00)
Govt. service	01(2.00)	01(2.00)	02(2.00)
Livestock farming	15 (30.00)	10(20.00)	25 (25.00)
Crop farming	27 (54.00)	35 (70.00)	62 (62.00)
Private service	-	01(2.00)	01(1.00)

Annual household income (Rs.)

Low (8000-30334)	48(96.00)	06(12.00)	54(54.00)
Medium (30334-52668)	02(4.00)	22(44.00)	24(24.00)
High (52668-75000)	-	22(44.00)	22(22.00)

Figures in parentheses indicate percentage

A perusal of Table 4.1 indicates that majority of the respondents from female headed households (70%) were found in middle age group followed by 24 per cent in old age group. Rest fell in young age category. In male headed households, also 72 per cent were found in middle age group followed by 14 per cent in both young and old age groups. If the overall respondents considered together, it could be seen that about 71 per cent were found in middle age group followed by 19 per cent in old age group, and 10 per cent fell in young age category. Findings of the present study are consonance with the findings of Khin Mar Oo (2005), Subba (2010) and Rathod *et al.* (2011). They also observed that the majority of the dairy farmers (about 55 %) belonged to 30-50 years age group.

4.1.1.2 Religion

Ninety nine per cent of the respondents were Hindus, except the one per cent, who were Muslims. Hindu population was more in both the male and female headed households. Subba (2010) also reported that about 82 per cent of the respondents belonged to Hinduism, whereas 14.2 per cent of respondents were following Buddhism in the Sikkim.

4.1.1.3 Caste

In rural society, caste plays a vital role and often influences various aspects of rural life. A perusal of Table 4.1 shows that the majority of both female and male headed households belonged to the backward caste category. In female headed households, six per cent respondents were found in general category and 2 per cent came from schedule castes. The pooled figure indicates that 86 per cent of the respondents belonged to the other backward class (OBC) category followed by 8 per cent in general and 6 per cent in schedule castes (SC) categories.

Graphical representation of socio-personal characteristics of sampled households

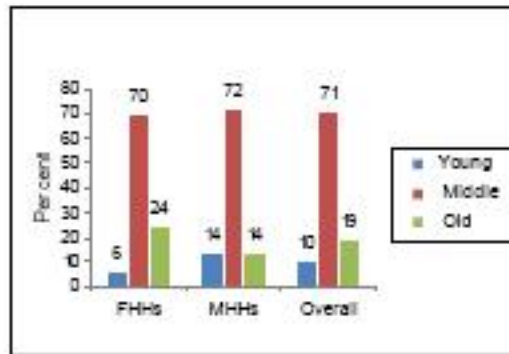


Fig. 5 : Distribution of respondents as per their age

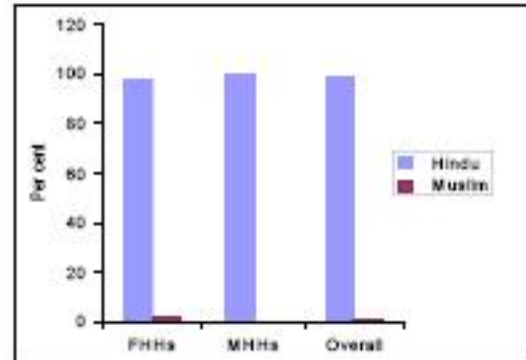


Fig. 6 : Distribution of respondents as per their religion

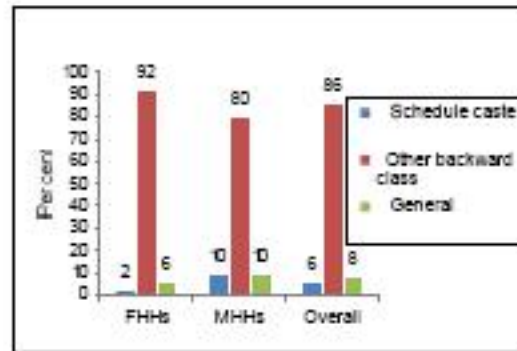


Fig. 7 : Distribution of respondents as per their caste

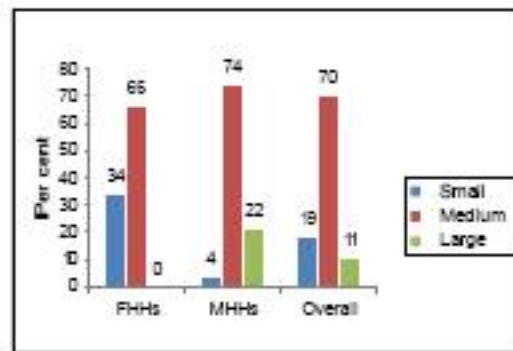


Fig. 8 : Distribution of respondents as per their family size

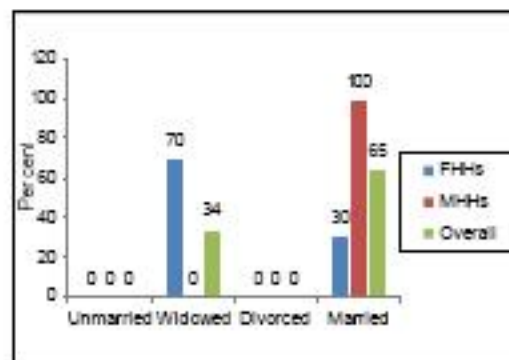


Fig. 9 : Distribution of respondents as per their marital status

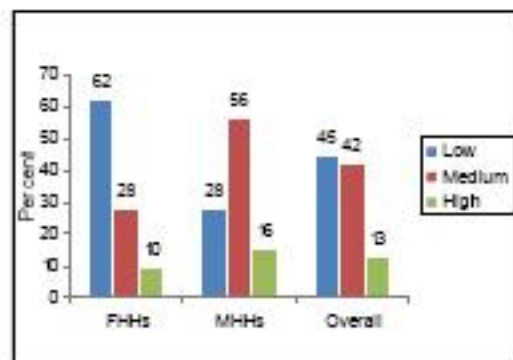


Fig. 10 : Distribution of respondents as per their family education status

4.1.1.4 Family Size

The size of family is one of the important factors influencing labor availability for livestock related activities. Table 4.1 shows that majority of female and male headed households belonged to medium family size comprised of 3-6 members. Overall figures also indicate that 70 per cent families had medium followed by 19 per cent respondents who had small families (1-3 member) and the rest had more than 6 members thus belonged to large family size.

4.1.1.5 Marital status

A perusal of Table 4.1 indicates that majority of the females heading the households (70%) were widowed followed by 30 per cent who were married, but their husband's have been migrated to the cities and were working out of village. All the male respondents under study were married and living with their spouse within the village.

4.1.1.6 Family education status

Education is one of the important factors which accelerate the growth of farm business. The standard of family education moulds the farmer's response to improved practices/technologies and in shaping an enterprise to earn more. A perusal of Table 4.1 reveals that 62 per cent female headed households found under low level of family education status whereas majority of the males heading the households (56%) had medium level of education. In overall sample, it could be seen that about 45 per cent of the respondents belonged to low followed by 42 per cent and 13 per cent, who were in medium and high categories, respectively as per their family education status. Thirty nine per cent of female headed households lack formal education compared to 10 per cent male headed households (UBOS, 2007).

4.1.1.7 Land holdings

Land is considered as one of the important socio-economic indicators in agricultural sector and rural development. The production processes at the farm and volume of livestock enterprise are mainly based

on the farm size. Table 4.1 indicates that 62 per cent of respondents in female headed households had marginal (<2.5 acres) land holding, 34 per cent were landless and 4 per cent owned between 2.5-5 acres land as compared to respondents of male headed households wherein 80 per cent had marginal (<2.5 acres) land holding, 12 per cent comprised no land and 8 per cent owned small (2.5-5 acres) land holding.

4.1.1.8 Major occupation

It referred to the family's major economic activities to earn a livelihood. Table 4.1 indicates that the dominance of agriculture followed by animal husbandry as their main occupation in both the response categories. Categorywise also, 54 per cent females against 70 per cent males heading the households were practicing agriculture. Livestock rearing was the major occupation found among 30 per cent female and 20 per cent male headed households. Fourteen per cent female and 6 per cent male were also working as labors in building constructions.

4.1.1.9 Annual household income

Respondents were earning either from sale of farm produce or products and by-products obtained from dairy and crop farming and also through sale of surplus animals as other sources of income. A perusal of Table 4.1 reveals that 96 per cent females heading the households had low annual income because of less resources and less accessibility of inputs and other facilities as compared to male, heading the households, wherein 44 per cent had medium and high (44%) level of annual income. Rao *et al.* (2003) reported that about 50 per cent families were earning 50-75 per cent of their income from dairying. There was no single family which was deriving less than 25 per cent of its income from dairying. Rathod *et al.* (2011) also revealed that 60.83 per cent of the women families had low followed by medium (35.83%) and high income (3.34%). Waldie and Ramkumar (2002) reported in their study that the approximate contribution of dairying to the total income ranged from 50 to 80 per cent in all the four southern states.

Graphical representation of socio-economic characteristics of sampled households

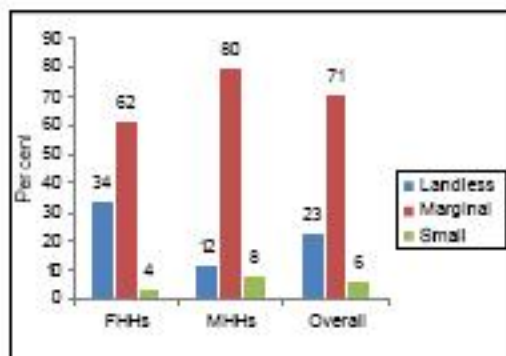


Fig. 11 : Distribution of respondents as per their land holding

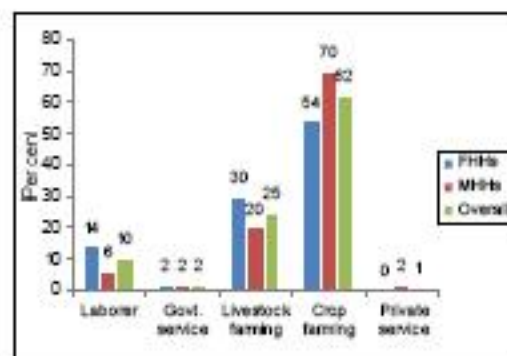


Fig. 12 : Distribution of respondents as per their major occupation

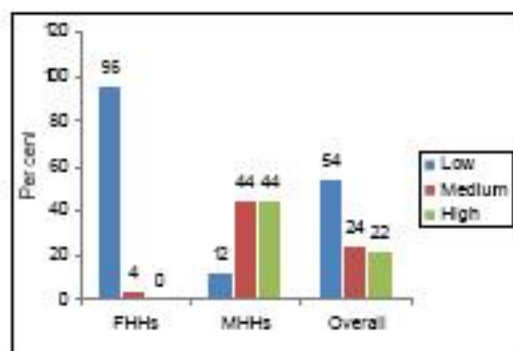


Fig. 13 : Distribution of respondents as per their annual households income

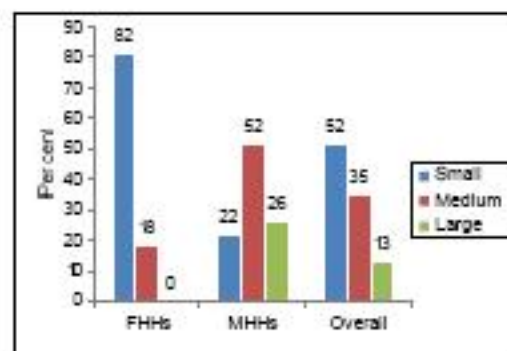


Fig. 14 : Distribution of respondents as per their herd size

Table 4.2: Herd distribution pattern of the sampled households

Socio-economic variables	Households		Overall (N=100)
	Female	Male	
	Headed (n=50)	Headed (n=50)	
Herd size			
Small (0.4 -3.25)	41(82.00)	11(22.00)	52(52.00)
Medium (3.25-6.10)	09(18.00)	26(52.00)	35(35.00)
Large (6.10-8.94)	-	13(26.00)	13(13.00)
Herd structure			
<i>Single animals</i>			
Cattle only	12(24.00)	03(6.00)	15(14.00)
Buffalo only	13(26.00)	10(20.00)	23(23.00)
Goat only	04(8.00)	-	04(4.00)
<i>Combination of two animals</i>			
Cattle + Buffaloes	08(16.00)	16(32.00)	24(24.00)
Buffalo + Goats	06(12.00)	-	06(6.00)
Cattle + Goats	06(12.00)	-	06(6.00)
Cattle + Draft animals	-	02(4.00)	02(2.00)
Buffalo + Draft animals	-	04(8.00)	04(4.00)
<i>Combination of three animals</i>			
Cattle + Buffalo + Goats	01(2.00)	04(8.00)	05(5.00)
Cattle + Buffalo + Draft animals	-	10(20.00)	10(10.00)
Cattle + Goat + Draft animals	-	01(2.00)	01(1.00)
Mode of acquisition			
Gift	05(10.00)	03(6.00)	08 (8.00)
Inherited them from family members	08(16.00)	02(4.00)	10(10.00)
Purchased from market	12(24.00)	08(16.00)	20(20.00)
Purchased from village	18(36.00)	04(8.00)	22(22.00)
Rearing and return	02(4.00)	05(10.00)	07(7.00)
Combinations of purchase from market/within village	05(10.00)	28(56.00)	33 (33.00)

Figures in parentheses indicate percentage

4.1.1.10 Herd size

The production and productivity of milch animals varied and considerably depended on the type of animal and the breeds maintained.

Table 4.3: Distribution of animals according to the land holding and average number of animals per households (N=100)

Herd composition	Households									
	Landless			Marginal			Small			Av. no. of animals per household
	FHHs (n=17)	MHHs (n=6)	Overall (n=23)	FHHs (n=31)	MHHs (n=40)	Overall (n=71)	FHHs (n=2)	MHHs (n=4)	Overall (n=6)	
Cattle	14(29.17)	11(61.11)	25(37.88)	20(36.36)	43(32.82)	63(33.87)	-	5(33.33)	5(29.41)	0.83
Buffaloes	10(20.83)	5(27.78)	15(22.73)	24(43.64)	55(41.98)	79(42.47)	2(100.00)	5(33.33)	7(41.18)	1.17
Goats	24(50.00)	2(11.11)	26(39.39)	11(20.00)	6(4.58)	17(9.14)	-	-	-	-
Draft animals	-	-	-	-	27(20.61)	27(14.52)	-	5(33.33)	5(29.41)	0.83
Total	48	18	66	55	131	186	2	15	17	2.83
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	

FHHs: Female Headed Households, MHHs: Male Headed Households
 Figures in parentheses indicate percentage

The study found that respondents were rearing local non-descript cows and buffaloes, crossbred cows and improved buffaloes, goats and draft animals singly or in combinations. In order to determine the strength of milch animals per family as a unit, average scores were computed based on comparative assigned values of cattle equivalents. Perusal of the data presented in Table 4.2 shows that majority of the females, heading the households (82%) had small herd size, followed by 18 per cent owned medium number of livestock. In contrast, 52 per cent male respondents, heading households were owning of medium size of herd followed by 26 per cent, who had large and the rest 22 per cent owned small number of livestock. Irrespective of the households, majority of the respondents (52%) had small number of livestock holding followed by 35 and 13 per cent, who had medium and large herd size, respectively. Rathod *et al.* (2011) in his study mentioned that about 80 per cent families had medium and 12 per cent had smaller livestock holding.

4.1.1.11 Herd strcutre

Table 4.2 further shows that majority of females, heading the households (58%) were depended on single animals either cattle, buffalo or goats. Rest of the households were rearing the livestock in different combination in small numbers. On the other side, male headed households owned large animals more in combinations. Goats were reared in combination only by few male headed families, whereas these were reared by majority of female respondents both singly and in combination. None of the female respondents had any draft animals as it was difficult to maintain by them due to resource poor and had either no land or small land holdings.

4.1.1.11.1 Distribution of animals according to land holding of households

A perusal of the data presented in Table 4.3 shows that 50 per cent goats from the total livestock were owned by landless females heading their households, as compared to landless male headed households, who were mainly rearing cows and buffaloes. This situation was different among the marginal land holding households wherein irrespective of households

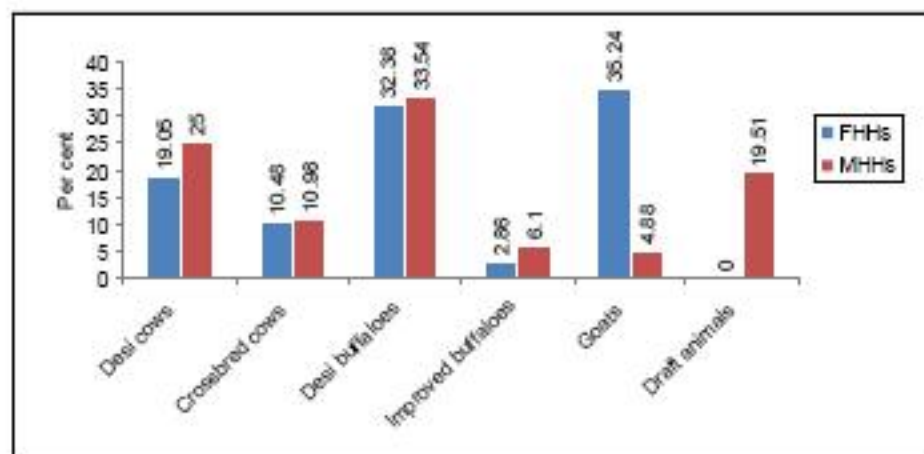


Fig. 15 : Specieswise and breedwise distribution of animals of respondents

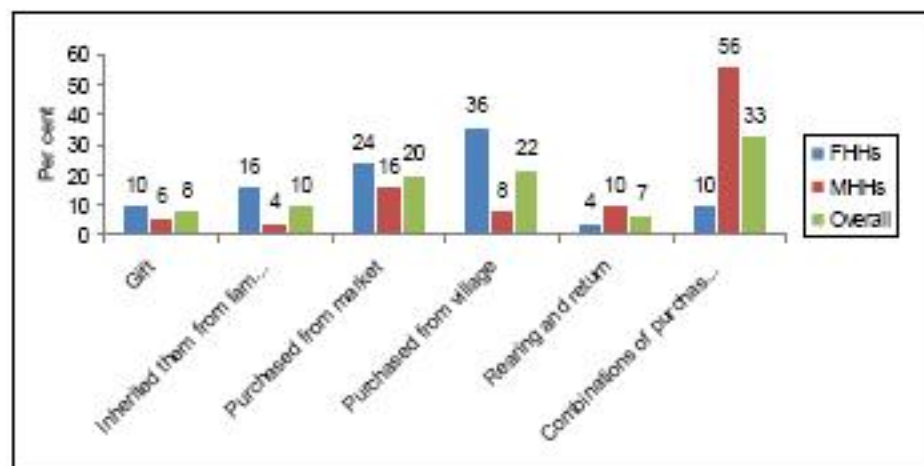


Fig. 16 : Distribution of respondents as per their mode of acquisition of livestock

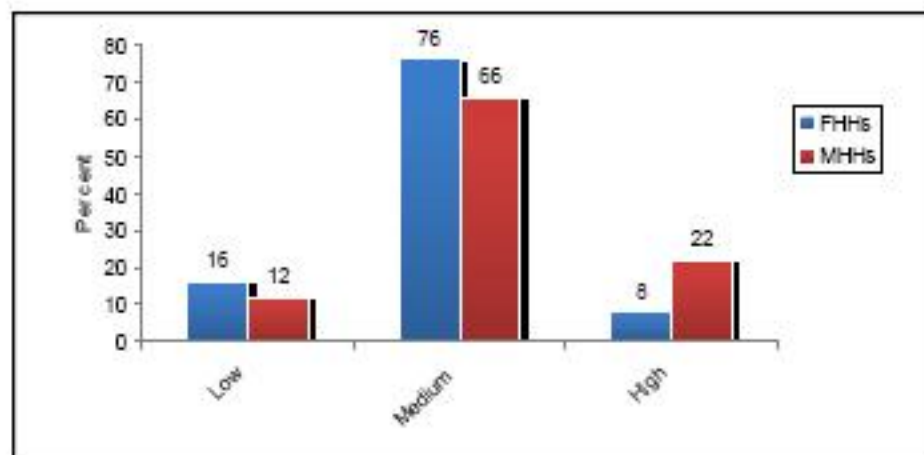


Fig. 17 : Distribution of respondents as per their productivity level of milch animals

both were rearing mainly 33.87 per cent buffaloes and 42.47 per cent cattle. Among small land holding categories 41.48 per cent buffaloes were being maintained by them of the total herd. Table 4.3 further reveals that number of large ruminants increased with increase in land holding and reduced the number of small ruminants.

Table 4.4 : Specieswise and breedwise distribution of animals of sampled households (N=100)

Type of animals	Households	
	Female Headed	Male Headed
Desi cows	20(19.05)	41(25.00)
Crossbred cows	11(10.48)	18(10.98)
Desi buffaloes	34(32.38)	55(33.54)
Improved buffaloes	03(2.86)	10(6.10)
Goats	37(35.24)	08(4.88)
Draft animals	-	32(19.51)
Total	105(100.00)	164(100.00)

Figures in parentheses indicate percentage of animals

Results presented in Table 4.4 indicates that majority of goats (35.24%) reared by female headed households followed by desi buffaloes (32.38%) and desi cows (19.05%) as compared to male respondents who were rearing majority of desi buffaloes (33.54%) followed by 25 per cent desi cows. Similar percentage of crossbred cows (about 10.98%) were owned by both female and male respondents of sampled households. Scarcity of resources to maintain the crossbred cows and improved buffaloes may be the reason for owning less number of these animals.

4.1.1.12 Mode of acquisition of livestock

The study revealed the varied modes of acquisition of livestock between the female and male headed households. According to majority of the respondents from female headed households purchased their livestock from village itself followed by 24 per cent, who could purchase from market as compared to male headed households, wherein only 8

Table 4.5 : Information seeking behavior of the sampled households

(N=100)

Information seeking sources	Frequency of information seeking of sampled households						i ² value
	Female Headed (n=50)			Male Headed (n=50)			
	Always	Some times	Never	Always	Some times	Never	
Friends & relatives	32(64.00)	16(32.00)	02(4.00)	40(80.00)	07(14.00)	03(6.00)	72.140**
Neighbors	43(86.00)	06(12.00)	01(2.00)	38(76.00)	06(12.00)	06(12.00)	102.620**
Gram pradhan	-	15(30.00)	35(70.00)	02(4.00)	32(64.00)	16(32.00)	44.420**
Progressive farmers	-	04(8.00)	46(92.00)	02(4.00)	15(30.00)	33(66.00)	98.180**
Local leaders	-	26(52.00)	24(48.00)	-	19(38.00)	31(62.00)	1.000
Extension personnel	-	09(18.00)	41(82.00)	-	40(80.00)	10(20.00)	0.040
Development dept. officers (BDO, DDO, VDO, VO etc.)	-	10(20.00)	40(80.00)	6(12.00)	30(60.00)	14(28.00)	36.560**
University/Institute personnel	-	07(14.00)	43(86.00)	-	24(48.00)	26(52.00)	14.440**
Private agency staff.	-	-	50(100.00)	-	07(14.00)	43(86.00)	73.960**
NGOs	-	-	50(100.00)	-	04(8.00)	46(92.00)	84.640**

Figures in parentheses indicate percentage

** significant at 1 per cent level of significance (p<0.01)

per cent purchased from village itself and 16 per cent from the market. Majority of male headed households acquired their animals in both from market and within village. Rao *et al.* (2002) also mentioned that majority of the respondents used a combination of ways to acquire the animal assets.

4.1.2 Communication profile of sampled households

Profile of the sampled households was studied through information seeking behavior, information sharing behavior and mass media ownership of both female and male respondents heading their households and their frequency of utilization. Data were collected in three point continuum viz. always, sometimes and never, later frequency and percentages were calculated under their communication profile.

4.1.2.1 Information seeking behavior

Speedy and effective transfer of information is basic to livestock development. Thus frequency of extension contact and participation in extension activities assumed greater significance. Data presented in Table 4.5 indicates that neighbors were the major information sources of female respondents (86%) followed by friends and relatives (64%) whereas 80 per cent of male respondents sought information from friends and relatives followed by neighbors (76%). Fifty two per cent female respondents were sometimes taking information about livestock management from local leaders as compared to 62 per cent male respondents. Majority of females were not using extension personnel as information sources, thus had low access to extension personnel. On the other side 80 per cent males were sometimes contacting extension personnel for receiving the technical information on animal husbandry. Private agency staff and NGOs were also used sometimes by males whereas these sources were not at all used by females. Women mainly sought information from the friends and neighbors because they were easily available and accessible within the village and also trust on them. Statistically significant differences were observed in information seeking at 1% level of significance between the

Table 4.6: Information sharing behavior of the sampled households

(N=100)

Information sharing sources	Frequency of information sharing of sampled households						i ² value
	Female Headed (n=50)			Male Headed (n=50)			
	Always	Some times	Never	Always	Some times	Never	
Friends & relatives	38(76.00)	11(22.00)	01(2.00)	36(72.00)	06(12.00)	08(16.00)	75.380**
Neighbors	45(90.00)	04(8.00)	01(2.00)	30(60.00)	14(28.00)	06(12.00)	79.940**
Gram pradhan	02(4.00)	30(60.00)	18(36.00)	03(6.00)	43(86.00)	04(8.00)	75.140**
Progressive farmers	08(16.00)	35(70.00)	07(14.00)	10(20.00)	30(60.00)	10(20.00)	45.140**
Local leaders	-	10(20.00)	40(80.00)	05(10.00)	38(76.00)	07(14.00)	36.140**
Extension personnel	-	11(22.00)	39(78.00)	10(20.00)	26(52.00)	14(28.00)	28.340**
Development dept. officers							
(BDO, DDO, VDO, VO etc.)	-	05(10.00)	45(90.00)	06(12.00)	33(66.00)	11(22.00)	38.480**
University/Institute personnel	-	08(16.00)	42(84.00)	04(8.00)	40(80.00)	06(12.00)	38.720**
Private agency staff.	-	-	50(100.00)	-	05(10.00)	45(90.00)	81.000**
NGOs	-	-	50(100.00)	-	04(8.00)	46(92.00)	84.640**

Figures in parentheses indicate percentage

** significant at 1 per cent level of significance (p<0.01)

female and male respondents, heading their households with respect to all the sources except for local leaders and extension personnel, which did not yield significant difference.

4.1.2.2 Information sharing behavior

A perusal of Table 4.6 reveals that similar to information seeking sources, majority of the female headed households (90%) were also sharing information mainly with neighbors followed by friends and relatives (76%) as compared to males wherein 72 per cent respondents were sharing information with friends and relatives followed by neighbors (60%). Eighty six per cent of males also share information with gram pradhan as compared to 60 per cent females. Sixty to seventy per cent of females heading the households shared information sometimes also with the gram pradhan and progressive farmers whereas males utilized these sources upto 86 per cent. Local leaders, extension personnel, development department officers and university/Institute personnel were more frequently used by male respondents as compared to females. Private agency staff and NGOs were not used by females for sharing information related to the improved livestock management practices. Results of χ^2 also revealed significant differences at 1% level of significance in information sharing behavior between female and male respondents of the sampled households with respect to all the sources studied.

4.1.2.3 Mass media ownership

Mass media sources of information play an important role in dissemination of information relating to all walks of life including animal husbandry and agricultural technologies. It is largely believed that better the ownership and use of these sources of information, better will be the productivity and quality of life. The results from Table 4.7 indicates that both set of respondents (72 per cent females and 82 per cent males) had mobile phones followed by 36 per cent female headed households and 48 per cent male headed households were owning the radio. Ownership of

male headed households regarding television as a mass media source was comparatively higher (30%) than female headed households. Radio used daily by majority of both the sampled respondents. Mobile phone however, were used by the respondents as and when required.

Table 4.7 : Mass media ownership and its frequency of use of the sampled households

Mass media sources	Female Headed Households (n=50)					
	Ownership		Frequency of use			
	Yes	No	Daily	Weekly	Monthly	As per need
Radio	18(36.00)	32(64.00)	12(66.67)	6(33.33)	-	-
Newspaper	-	-	-	-	-	-
Magazine	-	-	-	-	-	-
T.V.	5(10.00)	45(90.00)	5(100.00)	-	-	-
Mobile phone	36(72.00)	14(28.00)	-	-	-	36(100.00)
Male Headed Households (n=50)						
Radio	24(48.00)	26(52.00)	20(83.33)	4(16.67)	-	-
Newspaper	2(4.00)	48(96.00)	2(100.00)	-	-	-
Magazine	-	-	-	-	-	-
T.V.	15(30.00)	35(70.00)	15(100.00)	-	-	-
Mobile phone	41(82.00)	9(18.00)	-	-	-	41(100.00)

Figures in parentheses indicate percentage

4.2 PRODUCTIVITY OF MILCH ANIMALS OF SAMPLED HOUSEHOLDS

Table 4.8 shows that irrespective of respondents category, both had medium level of productivity of their milch animals. Twenty two per cent male headed households, achieved higher productivity of their milch animals in comparison to only 8 per cent female headed households. Overall figures also indicates that majority of respondents (71%) had medium level of productivity of their milch animals. Khandekar (1992)

also reported that productivity of dairy animals was of medium level in majority of households in study area. Manivannan (2003) in his study revealed that significantly higher productivity of milch animals was achieved by urban respondents as compared to peri-urban and rural areas.

Table 4.8 : Productivity of milch animals of sampled households

Level of productivity (Scores)	Households		Overall (N=100)
	Female Headed (n=50)	Male Headed (n=50)	
Low (49.95-81.35)	08 (16.00)	06(12.00)	14 (14.00)
Medium (81.35-112.75)	38(76.00)	33(66.00)	71(71.00)
High (112.75-144.15)	04 (8.00)	11(22.00)	15 (15.00)

Figures in parentheses indicate percentage

4.2.1 Mean differences in different stages of milk production of their milch animals between the female and male headed households

A set of independent-sample t-test was conducted to compare the mean of production of milch animals between female and male headed households in each of desi cow (early, peak and late), crossbred cow (early, peak and late), desi buffalo (early, peak and late), improved buffalo (early, peak and late), goat (early, peak and late) separately to understand the significant differences, if any between the two set of households. Table 4.9 revealed the significant differences in the means of early and peak milk yield of desi cows between the female and male respondents, heading the households. No significant difference was found in the late milk yield of desi cows. However the milk yield of desi cows was higher in late period in male headed households like other stages in comparison to the animals owned by females. Milk yield of crossbred cows and desi buffaloes differed significantly in all stages between female and male headed households. Significant difference was also observed in the peak yield of improved buffaloes. No significant difference however was found in the all stages of milk yield of goats between female and male respondents of sampled households.

Table 4.9: Mean differences in different stages of milk production of milch animals between the female and male headed households

Milk production Stages	Milch animals species											
	Desi cows				Crossbred cows				Desi buffaloes			
	FHHs		MHHs		FHHs		MHHs		FHHs		MHHs	
	‘t’ value		‘t’ value		‘t’ value		‘t’ value		‘t’ value		‘t’ value	
Early	1.05	1.91	6.797**	1.90	2.30	2.062*	1.58	2.40	6.207**	2.83	3.25	1.543
Peak	3.18	4.64	6.471**	5.90	7.76	4.388**	5.26	6.62	4.402**	6.33	8.36	4.097**
Late	0.63	0.76	1.725	0.56	1.08	5.333**	0.72	0.96	3.470**	1.00	1.19	2.401*

FHHs: Female Headed Households, MHHs: Male Headed Households

** Significant at 1% level of significance (P<0.01)

* Significant at 5% level of significance (P<0.05)

4.3 GENDER BASED LEVEL OF PARTICIPATION OF RESPONDENTS IN SMALL SCALE DAIRYING

Involvement of women and men in dairy management activities varied and depend on the type of activity, type of animal and other socio-economic characteristics. Role of gender in dairying viz: feeding, breeding, health care, management, preparation & processing of milk products and marketing were studied separately and ranked on the basis of mean scores obtained by the female and male respondents heading the households.

4.3.1 Level of participation in feeding activities

A perusal of Table 4.10 shows that the independent participation of the females, heading their household was more (86%) in mixing & giving feed to the animals as compared to male headed households wherein only 20 per cent were independently doing this activity. Seventy four per cent women respondents were also independently involved in providing water to the animals against 16 per cent male respondents. Taking animals for grazing in female headed household, was the activity, being done exclusively by others including children in 70 per cent households, whereas in male headed households, 48 per cent males were independently involved for grazing activity. Regarding cutting of fodder and grasses participation of the women in female headed households was found to the extent of 40 per cent independently as compared to males, whose participation was 64 per cent. Sixty two per cent children from female headed households were doing the activity of transportation of fodder/grasses from field whereas male members were involved in male headed households upto 70 per cent. Thus women from female headed households were mostly involved in indoor feeding activities of their animals and their participation was less in outdoor activities related to grazing of animals, cutting and transportation of fodder. Statistically significant differences were observed ($P < 0.01\%$) for all the activities studied with respect to their extent of involvement of females and males headships in feeding activities. Role of women in mixing & giving

Table 4.10: Gender based level of participation of respondents in feeding activities of animals (N=100)

Feeding activities	Level of participation of sampled households						i ² value
	Female Headed (n=50)			Male Headed (n=50)			
	Independent	Joint	Other	Independent	Joint	Other	
Mixing & giving feed to the animals	43(86.00)	04(8.00)	03(6.00)	10(20.00)	37(74.00)	03(6.00)	35.780**
Giving water to the animals	37(74.00)	06(12.00)	07(14.00)	08(16.00)	33(66.00)	09(18.00)	14.060**
Taking the animals for grazing	07(14.00)	08(16.00)	35(70.00)	24(48.00)	04(8.00)	22(44.00)	30.620**
Cutting of grasses/ fodder for animals	20(40.00)	06(12.00)	24(48.00)	34(68.00)	-	16(32.00)	36.560**
Transporting of grasses / fodder from fields	08(16.00)	11(22.00)	31(62.00)	35(70.00)	-	15(30.00)	22.580**

Figures in parentheses indicate percentage
 **significant at 1% level of significance (P<.01)

Table 4.11: Gender based level of participation of respondents in breeding activities of animals (N=100)

Breeding activities	Level of participation of sampled households						i ² value
	Female Headed (n=50)			Male Headed (n=50)			
	Independent	Joint	Other	Independent	Joint	Other	
Observing the animal when comes into heat	19(38.00)	08(16.00)	23(46.00)	44(88.00)	-	06(12.00)	46.220**
Taking animal for A.I.	16(32.00)	07(14.00)	27(54.00)	36(72.00)	-	14(28.00)	33.020**
Taking animal for natural service	17(34.00)	10(20.00)	23(46.00)	38(76.00)	-	12(24.00)	30.500**
Taking animal for pregnancy diagnosis	16(32.00)	12(24.00)	22(44.00)	40(80.00)	-	10(20.00)	29.120**

Figures in parentheses indicate percentage

**Significant at 1% level of significance (P<0.01)

feed to the animals was in agreement with the Jain and Verma (1992). Involvement of women as compared to men was more than 60 per cent for stall feeding, watering and forage collection has been revealed by Negi and Rawat, 2010 . Rathod *et al.* (2011) in their study also revealed that about 87 per cent of rural women were involved in feeding of animals followed by watering (85%). The findings are in line with the findings of Tanwar (2012) who also reported that involvement of farm women in feeding practices ranged from 76.25 to 96.67 per cent.

4.3.2 Level of participation in breeding activities

Table 4.11 revealed the significant differences in the extent of participation of the female and male respondents heading their households with respect to the animal breeding activities. Thirty eight per cent females, heading the households were observing the animal independently when it comes in heat as compared to male headed households (88%). Independent participation of the male respondents in providing A.I. service was 72 per cent against 32 per cent female respondents. In female headed households such activities were performed exclusively by children. Seventy six per cent males against 34 per cent females were independently involved in taking the animal for natural service and about 80 per cent male respondents participated independently for approaching the veterinarian for pregnancy diagnosis whereas independent participation of female headed households was found to be 32 per cent. Statistically significant differences were observed ($P < 0.01\%$) for all the breeding activities studied with respect to their level of involvement between females and males heading the households. Our findings are in close accordance with the most of findings of Subba (2010) for Sikkim women. Similar observations were also reported by Tanwar (2012) According to him, taking animal for A.I./natural service & pregnancy diagnosis and getting the services of veterinarian during dystokia were less performed by farm women and were mainly performed by male members of the family.

Table 4.12: Gender based level of participation of respondents in health care activities of animals (N=100)

Health care activities	Level of participation of sampled households						i ² value
	Female Headed (n=50)			Male Headed (n=50)			
	Independent	Joint	Other	Independent	Joint	Other	
Care of new born calf/kid	35(70.00)	06(12.00)	09(18.00)	14(28.00)	29(58.00)	07(14.00)	16.460**
Care of sick animals	42(84.00)	05(10.00)	03(6.00)	20(40.00)	24(48.00)	06(12.00)	42.980**
Care of animal during pregnancy	43(86.00)	05(10.00)	02(4.00)	10(20.00)	33(66.00)	07(14.00)	30.020**
Taking animal for vaccination	29(58.00)	05(10.00)	16(32.00)	38(76.00)	-	12(24.00)	58.940**
Taking animal for treatment of diseases by V.O.	38(76.00)	06(12.00)	06(12.00)	43(86.00)	-	07(14.00)	102.980**
Apply/give medicines to animal at home	37(74.00)	09(18.00)	04(8.00)	25(50.00)	17(34.00)	08(16.00)	39.920**

Figures in parentheses indicate percentage

**significant at 1% level of significance (P<.01)

Table 4.13: Gender based level of participation of respondents in management activities of animals (N=100)

Management activities	Level of participation of sampled households						i ² value
	Female Headed (n=50)			Male Headed (n=50)			
	Independent	Joint	Other	Independent	Joint	Other	
Cleaning of animal shed	41(82.00)	07(14.00)	02(4.00)	07(14.00)	35(70.00)	08(16.00)	25.040**
Milking of animal	39(78.00)	07(14.00)	04(8.00)	21(42.00)	19(38.00)	10(20.00)	34.160**
Collection of dung	32(64.00)	07(14.00)	11(22.00)	07(14.00)	33(66.00)	10(20.00)	6.860*
Bathing/grooming of animals	40(64.00)	04(8.00)	06(12.00)	07(14.00)	35(70.00)	08(16.00)	17.780**

Figures in parentheses indicate percentage

**significant at 1%level of significance (P<.01)

*significant at 5%level of significance (P<.05)

4.3.3 Level of participation in health care activities

Table 4.12 revealed that most of the animal health care related activities were managed by women independently (upto 82%) in the female headed households as compared to male respondents (upto 42%) who were jointly engage in such activities with spouse or children. Women respondents however, were less involved in taking the animals for vaccination as compared to male respondents. Statistically significant differences were found at 1 per cent level for all the activities studied under health care of their animals between the female and male headed households. Tanwar (2012) also reported that the farm women were actively participated in care of newly born calf (69.58%), care of sick animals (66.07%) and care of pregnant animals (59.58%).

4.3.4 Level of participation in management activities

Table 4.13 shows that 64-82 per cent female respondents, heading their households were independently involved in cleaning of animal shed, milking of animals, dung collection, bathing and grooming of animals. In case of male respondents, these activities were mainly performed jointly with spouse or children. Significant differences were found in participation of all the animal management activities studied between female and male headed households. Our findings are in agreement with the findings of Subba (2010) that majority of women involved in the management related activities of livestock. Cent per cent of the women involved in cleaning of shed, dung disposal and animal care at calving (Sikka and Dixit, 2006). More than 88 per cent women involved in litter collection, milk extraction, cleaning of animal shed and making compost as compared to men (Negi and Rawat, 2010).

4.3.5 Level of participation in milk processing and marketing activities

Ninety per cent females heading their households were independently engaged in preparation and processing of milk products,

Table 4.14: Gender based level of participation of respondents in preparation & processing of milk products and marketing activities of animals (N=100)

Activities	Level of participation of sampled households						χ ² value
	Female Headed (n=50)			Male Headed (n=50)			
	Independent	Joint	Other	Independent	Joint	Other	
Preparation and processing of milk products	45(90.00)	-	05(10.00)	-	-	50(100.00)	1.000
Marketing							
<i>Selling and purchasing of animals</i>	17(34.00)	03(6.00)	30(60.00)	43(86.00)	07(14.00)	-	38.000**
<i>Selling of calf/ kid</i>	19(38.00)	02(4.00)	29(58.00)	47(94.00)	-	03(6.00)	61.520**
<i>Disposal of milk at collection centre</i>	10(20.00)	07(14.00)	33(66.00)	28(56.00)	-	22(44.00)	35.540**
<i>Record keeping</i>	12(24.00)	04(8.00)	34(68.00)	20(40.00)	-	30(60.00)	54.080**

Figures in parentheses indicate percentage

**significant at 1% level of significance (P<.01)

which did not hold true in case of male headed households. Regarding marketing activities, 94 per cent male respondents were independently performed the activity related to sale and purchase of calf/kid, sale and purchase of animals (86%), disposal of milk at collection centre (56%) and record keeping (40%) as compared to female respondents, whose independent participation in marketing activities was found quite low. Significant differences however, were found ($P < 0.01$) in the extent of involvement of respondents in female and male headed households in all the marketing activities of animals. Singh and Sharma (1991) however, reported that in Himalayan hills of Uttar Pradesh, the majority of dairy marketing activities were shared equally by male and female. The finding related to the marketing i.e. selling and purchasing of animals is in consonance with the Tripathi and Arya (1995) that the women participation was less as compared to men in the areas of sale and purchase of animals. Similar findings were observed by Yadav *et al.* (2005) with respect to record maintenance.

4.3.6 Ranking according to respondents participation in dairying production activities

Table 4.15 shows the gender based ranking by mean scores according to the level of participation of females and males, heading their households in various dairy production categories. The four top ranking activities of female headed households were; preparation & processing of milk products, management, health care and feeding of animals which were ranked I, II, III & IV respectively. For male respondents ranking was different. It was highest in breeding followed by marketing, health care and feeding of animals were the top four activities as per their level of participation, thus ranked I, II, III & IV, respectively. Correspondingly, the lowest ranking activities for the male headed households were management and preparation & processing of milk products and for females it was breeding and marketing of animals. Women participation in breeding activities was found to be less among the selected activities due to social norms and taboos in the society. Role of females, heading

Fig. 18 : Women performing various dairy related task



their households in marketing related activities of livestock was least because of their mobility constraints and also they were not having complete control over marketing of animals and their produce. Females mostly participated in the indoor activities like preparation & processing of milk products, health care & management of animals, thus scored higher ranks in such areas.

Table 4.15 :Gender based ranking by mean scores according to the participation in various activities of dairying (N=100)

Activity type	Households					
	Female Headed (n=50)			Male Headed (n=50)		
	Mean	SD	Rank order	Mean	SD	Rank order
Feeding	2.026	0.000000	IV	2.184	0.820265	IV
Breeding	1.865	0.894863	V	2.580	0.816661	I
Health care	2.610	0.710990	III	2.340	0.735249	III
Management	2.645	0.679177	II	2.030	0.625344	V
Preparation & processing of milk products	2.800	0.606092	I	1.000	0.000000	VI
Marketing	1.660	0.898134	VI	2.422	1.266668	II

SD=Standard deviation

4.3.7 Correlation analysis between extent of participation of the sampled respondents in dairying with selected independent variables

Table 4.16 indicates that land holding was found to be significantly correlated with the participation in dairying activities among the female headed households while the remaining variables failed to attain the statistical level of significance. The variables age and occupation were found to be positively correlated whereas, education, herd size and family size were negatively correlated. It indicates that with the increase in land holding, the level of participation of females, heading their households also increased in dairying related activities. In case of male headed households, not a single variable

showed significant relationship with their participation in dairy management practices. Herd size and occupation had positive but non significant relationship. Remaining variables had negative and nonsignificant relationship with their participation in dairy management practices. Overall figure shows that the age, land holding, herd size, occupation were positively but non significantly correlated indicating that with the increase in age, land holding, herd size the participation of respondents in dairy management practices also increases. Independent variable age was also positively correlated with participation of females in dairying activities because of increase in the age experience of the respondents increases so they were doing these activities with more perfection as compared to the young respondents.

Table 4.16 :Relationship between independent variable of respondent with their participation in dairying activities

Independent variables	Households (N=100)		Overall (N=100) Correlation coefficient ('r' value)
	Female Headed (n=50)	Male Headed (n=50)	
	Correlation	Correlation	
	coefficient ('r' value)	coefficient ('r' value)	
Age	+0.187480	-0.024290	+0.045975
Education	-0.161580	-0.121340	-0.099760
Land holding	+0.464780**	-0.069080	+0.150894
Herd size	-0.048570	+0.170976	+0.110148
Family size	-0.082160	-0.204170	-0.114660
Occupation	+0.088518	+0.100246	+0.095704

** Significant at 1% level of significance ($P < 0.01$)

4.4 LIVESTOCK OWNERSHIP AND CONTROL PATTERN OF SAMPLED HOUSEHOLDS

Livestock ownership and control pattern were found different between female and male headed households. A perusal of Table 4.17 shows that 40 per cent respondents of female headed households had

Graphical representation of livestock ownership and control pattern of sampled households

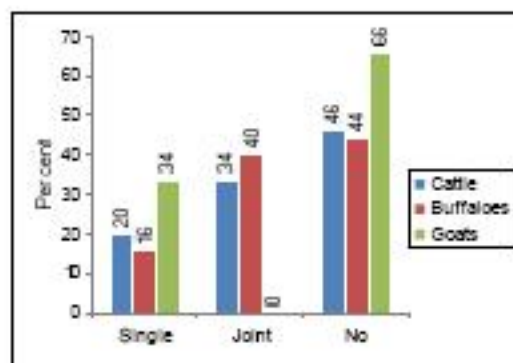


Fig. 19 :Livestock ownership pattern of female headed households

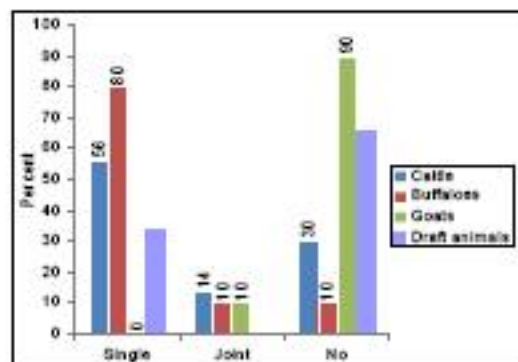


Fig. 20 :Livestock ownership pattern of male headed households

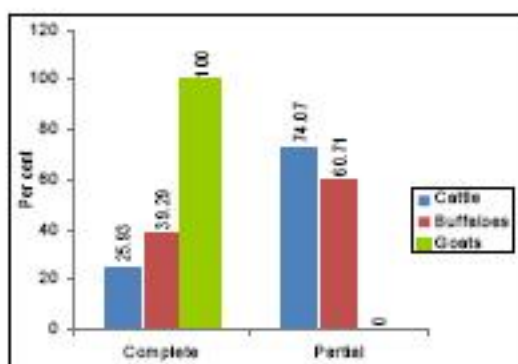


Fig. 21 :Livestock control pattern of female headed households

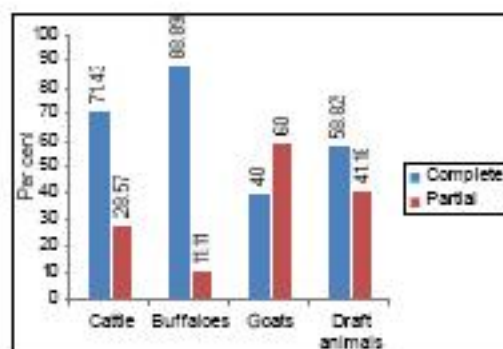


Fig. 22 :Livestock control pattern of male headed households

joint ownership for the buffaloes followed by cattle (34%). Thirty four per cent of female respondents had single ownership of goats. Regarding control, majority of respondents had partial control over large ruminants and 100 per cent had complete control over small ruminant (goats). In case of male headed households, 80 per cent respondents had ownership of buffalo individually followed by cattle (56%). Goats were owned only by 10 per cent families and had joint ownership. Males had complete control over large animals including cattle, buffalo and draft animals. Only 40 per cent male respondents had complete control over goats. Otherwise more partial control was prevalent for the small ruminants among the male headed households revealing the fact that the control of female was more for the goats irrespective of the household headship. Oluka *et al.* (2003) also reported that women own fewer cattle but relatively more small stock than men. Regarding control men have a disproportionate control over access to livestock resources and benefits.

Table 4.17 : Ownership and control over livestock of the sampled households

Livestock	Female Headed Households (n=50)				
	Ownership			Control	
	Single	Joint	No	Complete	Partial
Cattle	10(20.00)	17(34.00)	23(46.00)	07(25.93)	20(74.07)
Buffaloes	08(16.00)	20(40.00)	22(44.00)	11(39.29)	17(60.71)
Goats	17(34.00)	-	33(66.00)	17(100.00)	-
Male Headed Households (n=50)					
Cattle	28(56.00)	07(14.00)	15(30.00)	25(71.43)	10(28.57)
Buffaloes	40(80.00)	05(10.00)	05(10.00)	40(88.89)	05(11.11)
Goats	-	05(10.00)	45(90.00)	02(40.00)	03(60.00)
Draft animals	17(34.00)	-	33(66.00)	10(58.82)	07(41.18)

Figures in parentheses indicate percentage

4.5 INPUT DELIVERY SYSTEMS AND ACCESSIBILITY TO VARIOUS SERVICES

Various input delivery systems, its distance of availability, accessibility to various animal husbandry related extension services,

Table 4.18 : Input delivering agencies and distance of its availability to the sampled households (N=100)

Inputs	No. of families using inputs	Female Headed Households (n=50)						
		Agencies			Distance of availability			
		Market	Own field	Cooperative	Block vet.hospital	Within village /2kms	3-5kms	More than 5kms
Fodder seeds	33	08(24.24)	25(75.76)	-	-	25(75.76)	06(18.18)	02(6.06)
Fertilizer	33	31(93.94)	-	02(6.06)	-	-	26(78.79)	07(21.21)
Dry fodder	50	18(36.00)	32(64.00)	-		34(68.00)	13(26.00)	03(6.00)
Concentrate	50	17(34.00)	33(66.00)	-	-	36(72.00)	14(28.00)	-
Mineral mixture	5	05(100.00)	-	-	-	-	05(100.00)	-
Vaccines	20	05(25.00)	-	-	15(75.00)	-	05(25.00)	15(75.00)
Dewormers	30	25(83.33)	-	-	05(16.67)	10(33.33)	15(50.00)	05(16.67)
Male Headed Households (n=50)								
Fodder seeds	44	14(31.82)	25(56.82)	05(11.36)	-	15(34.09)	17(38.64)	12(27.27)
Fertilizer	44	25(56.82)	-	19(43.18)	-	-	27(61.36)	17(38.64)
Dry fodder	50	08(16.00)	42(84.00)	-	-	40(80.00)	10(20.00)	-
Concentrate	50	26(52.00)	24(48.00)	-	-	24(48.00)	14(28.00)	12(24.00)
Mineral mixture	10	04(40.00)	-	-	06(60.00)	-	04(40.00)	06(60.00)
Vaccines	35	10(28.57)	-	-	25(71.43)	-	08(22.86)	27(77.14)
Dewormers	40	25(62.50)	-	-	15(37.50)	05(12.50)	20(50.00)	15(37.50)

Figures in parentheses indicate percentage

trainings, animal health services (public and private), credit (institutional and non institutional) and marketing for selling of produce of dairy of the respondents, heading their households were studied under this subhead separately for respondents came from female and male headed households.

4.5.1 Input delivery systems and distance of its availability

A perusal of Table 4.18 shows that majority of the females, heading their households (93.94%) were purchasing fertilizer from market. Females owning land used the fodder seeds, dry fodder and concentrate of their own field (64-75%). About 6 per cent respondents were purchasing fertilizer from cooperatives also. Animal health related inputs and dewormers were purchased mainly from market and vaccinated the animals through block veterinary hospital. Regarding the distance and approachability to various agencies for getting the inputs Table 4.18 further shows that the fodder seeds, dry fodder and concentrate were available for majority of female respondents within village followed by mineral mixture and fertilizer, which were available at a distance, 3-5 kms from village. For half of the female respondents dewormer was also available to about 3-5 kms distance of village and vaccines at more than 5 kms distance from village. For male respondents Table further revealed that the 56.82 per were procuring fertilizer from market and 43.18 per cent from cooperatives. About half of male headed respondents were using fodder seeds of their previous crops. Majority of respondents were using dry fodder and fodder seeds of own field. Mineral mixture and vaccines were taken from block veterinary hospital by more than half of male respondents. About 37 per cent respondents were taking dewormers also from block veterinary hospital. According to 80 per cent respondents dry fodder was available within village followed by concentrate feed (48%) for animal feed. Like females half of the male respondents were purchasing dewormers from 3-5 kms. Majority of males, heading their households revealed that the mineral

mixture and vaccines were available even more than 5 kms. According to UNHS 2005/2006, both male and female headed households make limited use of improved seeds and fertilizers, less than 5 per cent of all households used improved agricultural inputs.

4.5.2 Accessibility to various extension services, trainings, animal health services, marketing and credit of the sampled households

4.5.2.1 Access to extension services and trainings

Gender disparities in access to extension and training exist throughout the developing world. In the present study also, data were collected under the accessibility of extension, training, veterinary services, market and credit separately for female and male respondents, heading their households. According to Table 4.19, majority of female respondents had poor access to extension services (80%) and training (84%) as compared to male respondents wherein 64 per cent were accessible to extension services and trainings related to livestock farming. Finding of study in the Taurus Mountain villages in Turkey also unveiled the fact that most women farmers had little access to information about animal production through public extension services (Budaka *et al.*, 2005). Similar findings have been documented in Cameroon, Ghana and Madagascar (Salman *et al.*, 1999) in Pakistan (Teufel *et al.*, 1998) and in the Gambia (Jaitner *et al.*, 2001). The reasons given for this lack of access by women to extension services included women's long workdays, which precluded them from engaging with, or searching out, extension officers, a neglect of women's needs and circumstances when targeting extension work, related to livestock husbandry. Male headed households have higher access to agricultural extension services than females, heading their households. Access to extension service was higher among urban-based FHH (8%) than rural based FHH 6.7 per cent (UNHS, 2005-06).

4.5.2.2 Access to animal health services, market and credit

Public livestock health services often fail to serve the poorest livestock keepers, particularly in remote rural areas has been found in

Table 4.19: Accessibility of respondents to extension services, trainings, animal health services, market and credit of the sampled households (N=100)

Accessibility to various services	Households					
	Female Headed (n=50)		Male Headed (n=50)		Overall	
	Accessible	Not accessible	Accessible	Not accessible	Accessible	Not accessible
Extension services	10(20.00)	40(80.00)	32(64.00)	18(36.00)	42(42.00)	58(58.00)
Trainings	08(16.00)	42(84.00)	32(64.00)	18(36.00)	40(40.00)	60(60.00)
Animal health services						
<i>a. Public</i>	20 (40.00)	30(60.00)	40(80.00)	10(20.00)	60(60.00)	40(40.00)
<i>b. Private</i>	30(60.00)	20 (40.00)	10(20.00)	40(80.00)	40(40.00)	60(60.00)
Market for selling of its produce	21(42.00)	29(58.00)	44(88.00)	06(12.00)	65(65.00)	35(35.00)
Credit						
<i>a. Institutional</i>	10 (20.00)	40 (80.00)	22(44.00)	28(56.00)	32 (32.00)	68(68.00)
<i>b. Non institutional</i>	40 (80.00)	10 (20.00)	28(56.00)	22(44.00)	68(68.00)	32 (32.00)

Figures in parentheses indicate percentage

many earlier studies (Heffernan and Mistureli, 2008). Table 4.19 also indicates in the present study that majority of the female respondents (60%) were not having accessibility to public animal health services whereas 80 per cent males had access to public animal health services. Forty two per cent of females, heading their households had accessibility to market for selling its produce as compared to 88 per cent male respondents. Regarding access to credit, the study revealed that eighty per cent females had access to non institutional sources of credit as compared to male respondents, who had better accessibility to institutional credit sources. Earlier studies also revealed that in developing countries men generally have greater and easier access to credit than do women, whose lack of collateral makes them appear not creditworthy. Market availability was higher for food crops and much lower for high value commodities such as cattle and goats among female headed households have been revealed by earlier survey (UNHS, 2005-06). Ahuja *et al.* (2012) also observed that the farm women access to assets like, credit, machinery, and livestock production inputs were limited in study area. Kumar *et al.* (2012) also concluded that only 10 per cent women had access to credit and have different access to markets, infrastructures and other services. Women producers face greater constraints than men in accessing different points for agricultural commodity, value chains as well as related technologies, infrastructures and information about livestock market.

4.5.2.2.1 Preferences of the respondents towards various credit lending sources

Besides the accessibility to credit, data was also gathered regarding the preferences of the respondents for various credit sources separately for female and male headed households. Table 4.20 shows that the majority of female respondents (80%), heading their households preferred to have credit from friends and relatives followed by money lenders due to ease in approachability, simple and less interests. Banks were preferred by 6 per cent of respondents as compared to males who in majority (44%) preferred to have credit from banks. Fourteen per cent

Table 4.21: Preferences for animal health service providers of the sampled households (N=100)

Service providers	Households							
	Female Headed (n=50)				Male Headed (n=50)			
	Vaccination	Deworming	A.I.	Treatment	Vaccination	Deworming	A.I.	Treatment
Block vet. hospital	05(10.00)	06(12.00)	10(20.00)	05(10.00)	32(64.00)	25(50.00)	34(68.00)	16(32.00)
Veterinary institute	-	-	-	-	05(10.00)	-	05(10.00)	05(10.00)
Paravet	17(34.00)	10(20.00)	40(80.00)	10(20.00)	13(34.00)	20(40.00)	11(22.00)	20(40.00)
Quack	28(56.00)	21(42.00)	-	15(30.00)	-	05(10.00)	-	05(10.00)
Traditional healer	-	13(26.00)	-	20(40.00)	-	-	-	04(8.00)

Figures in parentheses indicate percentage

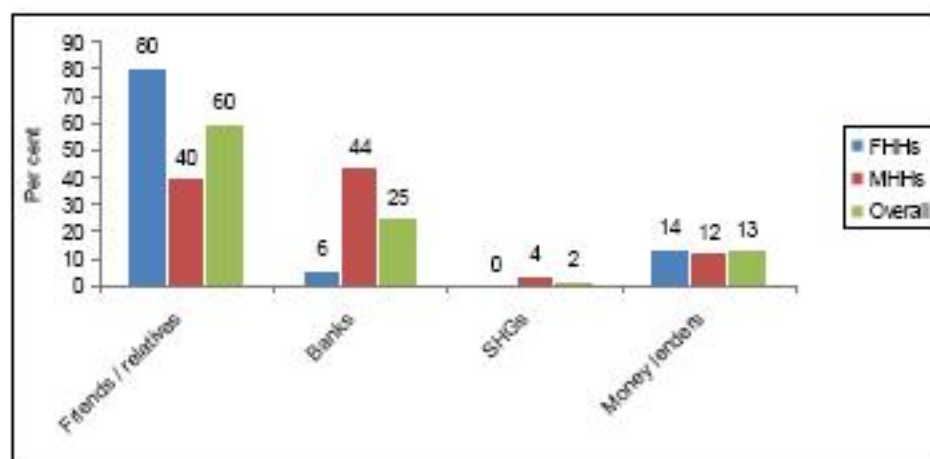


Fig. 23 : Distribution of respondents as per their preferences of credit lending sources

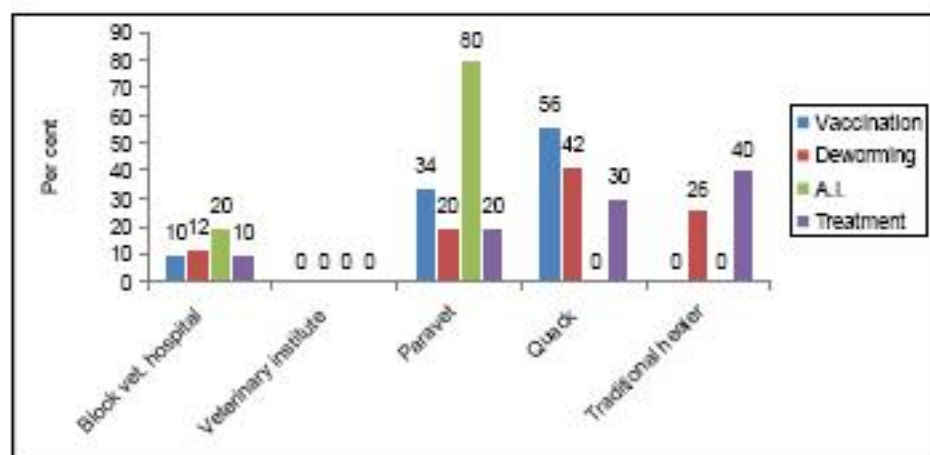


Fig. 24 : Distribution of female headed household as per their preferences for animal health service providers

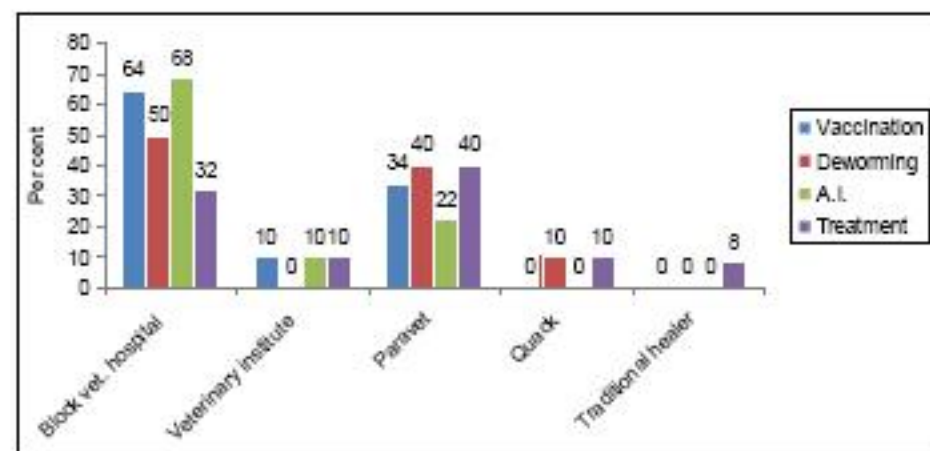


Fig. 25 : Distribution of male headed household as per their preferences for animal health service providers

female respondents also preferred to have credit from money lenders. Pooled figures also indicated that majority of respondents preferred to have credit from friends and relatives. Devaki (1999) also reported that less women were taking credit from bank as compared to men.

Table 4.20: Preferences of respondents towards various credit lending sources

Sources of credit	Households		Overall (N=100)
	Female Headed (n=50)	Male Headed (n=50)	
Friends/relatives	40(80.00)	20(40.00)	60(60.00)
Banks	03(6.00)	22(44.00)	25(25.00)
SHGs	-	02(4.00)	02(2.00)
Money lenders	07(14.00)	06(12.00)	13(13.00)

Figures in parentheses indicate percentage

4.5.2.2.2 Preferences of the respondents for various animal health service providers

Data presented in the Table 4.21 indicates that majority of females, heading their households preferred quack (42-56%) followed by paravet (20-34%) for deworming and vaccination of their animals. For A.I. also, women respondents (80%) preferred paravet due to easily available within village at less payments. However, they preferred quack and traditional healers more for treatment of sick animals. The preference of male respondents was different than women respondents. Majority of males preferred block veterinary hospital for A.I., vaccination and deworming. However for treatment of sick animals 40 per cent respondents also preferred paravet. Quacks were the least preferred animal health service providers by the male respondents and they were called only for treatment that too in emergency.

4.6 PERCEIVED CONSTRAINTS ELICITED BY THE RESPONDENTS IN TECHNOLOGY ADOPTION IN SMALL SCALE DAIRY PRODUCTION SYSTEM

Female and male headed households involved in livestock enterprises are encountered with numerous constraints in their day-to-day affairs.

Table 4.22: Gender based constraints and ranking in adoption of improved breeding practices in dairying (N=100)

Constraints in breeding practices	Households									
	Female Headed (n=50)					Male Headed (n=50)				
	Major constraint	Minor constraint	Not a constraint	Total score	Rank	Major constraint	Minor constraint	Not a constraint	Total score	Rank
Non functioning of A.I. centre/ill equipped A.I. centre	47(94.00)	03(6.00)	-	147	I	40(80.00)	10(20.00)	-	140	I
Lack of good breedable bulls for natural service	42(84.00)	04(8.00)	04(8.00)	138	VI	33(66.00)	11(22.00)	06(12.00)	127	V
Inadequate knowledge and poor appreciation for A.I. services	43(86.00)	05(10.00)	02(4.00)	141	IV	32(64.00)	08(16.00)	10(20.00)	122	VI
Low genetic potential of local animals	39(78.00)	11(22.00)	-	139	V	35(70.00)	10(20.00)	05(10.00)	130	IV
Poor conception rate and treatment of repeater is not rewarding	38(76.00)	09(18.00)	03(6.00)	135	VII	38(76.00)	09(18.00)	03(6.00)	135	II
Scarcity of resources to maintain CB/superior breed of milch animals	45(90.00)	04(8.00)	01(2.00)	144	II	36(72.00)	12(24.00)	02(4.00)	134	III
Distance of veterinary hospital for PD	45(90.00)	02(4.00)	03(6.00)	142	III	22 (44.00)	21(42.00)	07(14.00)	115	VII

Figures in parentheses indicate percentage

Here, constraints were studied under four categories of improved practices viz: breeding, feeding, management & health care and some other constraints perceived separately by female and male respondents for rearing their dairy animals. Respondents were asked to mention the constraints perceived by them in three point continuum scale as major constraint, minor constraint and not a constraint, with respective scores of 3, 2 and 1 respectively which were then ranked according to their total obtained scores separately for the respondents came from female and male headed households. The important constraints expressed by the respondents were assessed and results are presented in Tables.

4.6.1 Constraints perceived in adoption of improved breeding practices

It is evident from Table 4.22 that the major constraints revealed by females, heading their households were non functioning of A.I. centre/ill equipped A.I. centre ranked first followed by scarcity of resources to maintain crossbred cattle/superior breed of milch animals (ranked II). Distance of veterinary hospital for pregnancy diagnosis was revealed IIIrd major constraint by 90 per cent respondents. Male respondents heading their households, also kept first constraint in the similar order as mentioned by women respondents. Distance of veterinary hospital was one of the major constraint and ranked third by the females was kept at 7th rank by the male respondents. Our findings are in conformity with the observation of Umar *et al.* (2011), who also revealed that 82.66% respondents as revealed ill equipped and negligible services at A.I. centres as the first major constraint in adoption of improved breeding practices. Poor results of A.I. had been perceived by 82% of the farmers and distant location of A.I. centers by 73 per cent of respondents. Lack of knowledge about right time of mating, inexperienced staff at A.I. center, small size of herd etc. were the other constraints faced by dairy farmers in adoption of improved breeding practices of animals (Mohi, 2006).

Table 4.23: Gender based constraints and ranking in adoption of improved feeding practices in dairying (N=100)

Constraints in feeding practices	Households							
	Female Headed (n=50)				Male Headed (n=50)			
	Major constraint	Minor constraint	Not a constraint	Total score	Rank	Major constraint	Minor constraint	Not a constraint
Inadequate knowledge about scientific feeding	45(90.00)	03(6.00)	02(4.00)	143	I	38(76.00)	04(4.00)	08(16.00)
Preference to grow cash crops instead of fodder crops	38(76.00)	11(22.00)	01(2.00)	137	III	29(58.00)	15(30.00)	06(12.00)
Inadequate resources for cultivation of fodder crops round the year	33(66.00)	16(32.00)	01(2.00)	132	V	26(52.00)	15(30.00)	09(18.00)
High cost of ingredients of concentrates mixture / compound feed	43(86.00)	05(10.00)	02(4.00)	141	II	30(60.00)	15(30.00)	05(10.00)
Poor availability of HYV fodder seeds/perennial roots	38(76.00)	09(18.00)	03(6.00)	135	IV	24(48.00)	15(30.00)	11(22.00)
Under feeding due to limited financial resources	31(62.00)	16(32.00)	03(6.00)	128	VI	25(50.00)	16(32.00)	09(18.00)
Lack of grazing land facilities	33(66.00)	10(20.00)	07(14.00)	126	VII	23(46.00)	13(26.00)	14(28.00)

Figures in parentheses indicate percentage

4.6.2 Constraints perceived in adoption of improved feeding practices

Proper feeding of milch animals is one of the basis for successful dairy farming. The balance ration not only helpful in maintaining proper health, growth and reproduction, but also helpful in enhancing milk production and productivity. A profitable dairy unit should not only have genetically high yielder, but also should have provision for feeding to milch animals with minimum cost of balance ration for gaining better return. However, in the present study due to several constraints respondents were not able to adopt the improved feeding practices which directly influenced the productivity of milch animals. Table 4.23 shows that total score of constraints regarding to feeding practices revealed by respondents of female and male headed households did not reveal much variations. Inadequate knowledge about scientific feeding, high cost of ingredients of concentrates mixture and preference to grow cash crops instead of fodder crops were found to be the first, second and third major constraints in both set of respondents. Poor availability of HYV fodder seeds/perennial roots was found to be fourth constraint and inadequate resources for cultivation of fodder crops ranked fifth. Patil (2009) studied that 60 per cent respondents conveyed their constraint as high cost of concentrate and other feed. Eighty two per cent respondents revealed that inadequate knowledge about scientific feeding as the 1st major constraint observed by Umar *et al.* (2011), high cost of ingredients of concentrates mixture/compound feed ranked IIIrd major constraints by Murai *et al.* (2011) in adoption of scientific feeding practices.

4.6.3 Constraints perceived in adoption of improved management and health care practices

Better management and proper health care of dairy animals is important for maintaining higher productivity. According to the total score of constraints regarding management and health care faced by female and male headed households is listed in Table 4.24 along with its rankings. Lack of knowledge about common contagious diseases,

Table 4.24: Gender based constraints and ranking in adoption of improved management and health care practices in dairying (N=100)

Constraints in management and health care practices	Households							
	Female Headed (n=50)				Male Headed (n=50)			
	Major constraint	Minor constraint	Not a constraint	Total score	Rank	Major constraint	Minor constraint	Total score
Lack of knowledge about common contagious diseases, their causes & control measures	46(92.00)	03(6.00)	01(2.00)	145	I	35(70.00)	07(14.00)	08(16.00)
Lack of awareness and knowledge about importance of vaccination	44(88.00)	04(8.00)	02(4.00)	142	III	32(64.00)	06(12.00)	12(24.00)
Veterinary hospitals are ill equipped, lacking facility for treatment, vaccine etc.	45(90.00)	03(6.00)	02(4.00)	143	II	34(68.00)	13(26.00)	03(6.00)
Lack of awareness and knowledge about importance of health care	36(72.00)	08(16.00)	06(12.00)	130	V	18(36.00)	16(32.00)	16(32.00)
High cost/charge levied by veterinary staff for performing medical assistance	38(76.00)	08(16.00)	04(8.00)	134	IV	34(68.00)	14(28.00)	02(4.00)
Lack of proper knowledge about right time of drying up pregnant animal	36(72.00)	07(14.00)	07(14.00)	129	VI	18(36.00)	15(30.00)	17(34.00)

Figures in parentheses indicate percentage

their causes & control measures (Ist), ill equipped veterinary hospitals and lack of facility for treatment, vaccine etc. (IInd), lack of awareness and knowledge about importance of vaccination (IIIrd), high cost/charge levied by veterinary staff for performing medical assistance (IVth), lack of awareness and knowledge about importance of health care (Vth) were the constraints perceived by women respondents under management and health care of dairy animals. Male respondents however, revealed that high cost/charge levied by veterinary staff for performing medical assistance as first and foremost constraints followed by, ill equipped veterinary hospitals and lack of facility for treatment, vaccine etc. by 82 per cent respondents. Patil (2009) also reported that 68 per cent of the respondents, had inadequate knowledge of diseases, their prevention and control as their constraint, followed by 60.89 per cent respondents who perceived constraint as non-availability of A.I. facility and veterinary services. Lack of knowledge about common contagious diseases, their causes & control measures was also revealed as the 1st constraint in management and health care (Murai *et al.*, 2011).

4.6.4 Other constraints

Table 4.25 further revealed several other miscellaneous but important constraints regarding technology adoption by female and male headed households in small scale dairy production. Lack of awareness about women specific technology was found to be the first major constraint revealed by both set of respondents. Lack of knowledge in making value added products, lack of contact with extension agent, lack of proper training guidance, low price of milk, high cost of inputs, non availability of dairy cooperative societies and lack of loan facilities & high rate of interest were several other major constraints in ascending order revealed by women respondents. Male respondents however, revealed these constraints in slightly different order. According to 74 per cent male

Table 4.25: Other dairying related constraints in sampled households (N=100)

Other constraints	Households							
	Female Headed (n=50)				Male Headed (n=50)			
	Major constraint	Minor constraint	Not a constraint	Total score	Rank	Major constraint	Minor constraint	Not a constraint
Non availability of dairy cooperative societies	41(82.00)	03(6.00)	06(12.00)	135	VII	33(66.00)	09(18.00)	08(16.00)
Lack of loan facilities & high rate of interest	34(68.00)	16(32.00)	-	134	VIII	30(60.00)	13(26.00)	07(14.00)
Low price of milk	42(84.00)	06(6.00)	02(4.00)	140	V	37(74.00)	8(16.00)	05(10.00)
Lack of knowledge in making value added products	46(92.00)	02(4.00)	02(4.00)	144	II	32(64.00)	14(28.00)	04(8.00)
Lack of awareness about women specific technology	46(92.00)	04(8.00)	-	146	I	38(72.00)	08(16.00)	04(8.00)
High cost of inputs	43(86.00)	03(6.00)	04(8.00)	139	VI	29(58.00)	12(24.00)	09(18.00)
Lack of proper training guidance	44(88.00)	04(8.00)	02(4.00)	142	IV	22(44.00)	20(40.00)	08(16.00)
Lack of contact with extension agent	45(90.00)	03(6.00)	02(4.00)	143	III	23(46.00)	17(34.00)	10(20.00)

Figures in parentheses indicate percentage

respondents, low price of milk was one of the major constraints. About 63 per cent of the respondents perceived as inadequate money and lack of loan facility as their constraint (Patil, 2009) in adopting animal management practices by dairy farmers.

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*Summary
and
Conclusions*

Summary & Conclusions

This chapter deals with the summary of the major findings, conclusions, implications and recommendations as well as suggested areas for future research.

5.1 SUMMARY

The livestock sector is one of the fastest growing segments of the agricultural economy, particularly in the developing world. They are raised mainly for meat, milk and skin, and provide a flexible financial reserve (social security) in bad crop years for the rural population. It contributes 40 per cent of the global value of agricultural output and supports the livelihoods and food security of almost a billion people. The purposes of maintaining the livestock are different in different societies in gender perspective like for income generation, food security, draught purpose, fuel, manure, traditional life style and paying school fee (Heffernan *et al.*, 2003). Thus livestock is an important asset for women because it is often easier for many women to acquire livestock assets, whether through inheritance, markets or collective action processes, than it is for them to purchase land or other physical assets or to control other financial assets (Rubin *et al.*, 2010).

Women's involvement in livestock production and development has been a long-standing global tradition. In animal husbandry, women play multiple roles. Dairying at household level is the domain of women. Their activities vary widely ranging from care of animals, grazing and fodder collection, cleaning of animal sheds to processing milk and livestock products. Their contribution further increased if the households is headed

by female due to one or the other reasons like, war, sickness, death and migration of men from rural areas to towns and cities in search of paid employment. This not only reduced the male populations but also increased the contribution of women in agriculture. In some conditions, like death of husband, divorce, separation or desertion, migration of males for employment, female remain alone in the house hence they become head of the house, along with households work and opt for agriculture & animal husbandry or both for income generation & to fulfill the households requirements. In such households, she is more likely to be considered the owners of small stock compared to larger livestock, and have a say in the disposal and sale of small stock and its products, and in the use of income from this. According to census of India 2001, there are 19,987,858 female headed households out of this, the state of Uttar Pradesh alone has 2,031,752 female headed households. Role of female headed households in small scale dairy production is well recognized, but much less has been documented. Gender analysis is therefore very important in planning and implementing small stock development between the female and male headed households. A number of studies have been carried out on the participation in livestock husbandry, but no comparative study has so far been carried out in small scale dairy production system in the female headed households and its comparison with male headed households in terms of livestock production, its ownership & control, roles and technological constraints in adoption of dairy farming. In view of the above justification, the proposed study has been carried out to study the contributions of female headed households in small scale dairy production system in the gender perspectives with the following objectives-

1. To study the socio-economic and communication profile of respondents.
2. To compare the productivity of milch animals between the female and male headed households.

3. To study the gender disparities in participation, mode of acquisition of livestock, its ownership and control between the female & male headed households.
4. To understand the various input delivery systems and accessibility to various services.
5. To study the women's constraints in technology adoption in small scale dairy production system.

The present study has been carried out in the Bareilly district of Uttar Pradesh which was selected purposively because of the familiarity of the researcher with the local language, customs and culture which helped in building up rapport with the respondents.

Bareilly district consists of 15 community development blocks, Out of 15, five blocks were selected randomly. From each of the selected blocks, 10 adjacent villages were selected to make a cluster. Thus 50 villages were selected and made 05 clusters consisting 10 villages in each cluster. From each of the 05 clusters, 10 female headed households were selected randomly after preparing a comprehensive list of such households and using focus group technique. An equal number of male headed households were also be selected from the same clusters randomly. Thus from each cluster, 20 households (10 female headed households + 10 male headed households) were selected. Final data were collected from 100 distinct households (50 female headed + 50 male headed) from 05 different clusters comprising 50 villages from 05 different blocks of Bareilly district. Data were collected personally through final interview schedule from the selected respondents separately from female and male headed households supported with help of observations, interaction etc.

The socio-personal and economic variables, communication variables, input delivery system and accessibility to extension services, trainings, animal health services, market and credit, gender role in livestock production, ownership and control over livestock, constraints in technology adoption were the independent variables and productivity

of milk was selected as dependent variable to fulfill the objectives of the study. Socio-personal and economic status of the respondents were studied through age, religion, caste, marital status, family education status, family size, family land holding, herd size and modes of its acquisition, major occupation and annual household income. Communication profile of respondents was studied through information seeking and sharing behavior, mass media ownership and frequency of use. All these independent variables were measured through available scales/measures and using structured interview schedule. Productivity of milk was measured by Milk yield index (Yang, 1980). Frequency, percentage, mean, standard deviation, χ^2 , t-test, correlation analysis were the statistical tools used with suitable formulae for the purpose of analysis and interpretation of collected data.

Major research findings

1. Majority of respondents (71%) picked from female and male headed households belonged to middle age group (25-50 yrs).
2. Ninety nine per cent of the respondents followed Hindu religion, in the overall sampled households.
3. Majority of the female respondents (92%) belonged to the other backward class (OBC) category as compared to 80 per cent male respondents of sampled households.
4. Majority of both the females and males, heading their households belonged to medium family size comprising 3-6 members.
5. Seventy per cent of female respondents were widowed and the spouse of rest of the women were migrated to the cities. All the male respondents under study were married and were living with their spouse in the village itself.
6. Sixty two per cent respondents of female headed households had low level of education status whereas majority of the male respondents (56%) had medium level of education.
7. More than half of the female headed households (62%) had marginal (<2.5 acres) land holding and 34 per cent were landless.

Amongst male headed households, 80 per cent had marginal (<2.5 acres) land holding, 12 per cent comprised no land and 8 per cent owned small (2.5-5 acres) land holdings.

8. Irrespective of the households, majority of the respondents (52%) had small number of livestock followed by 35 and 13 per cent, who had medium and large livestock holding, respectively.
9. Majority of the female headed households (36%) purchased animals from village itself as compared to majority of male headed households (56%) who acquired their animals in combination of two either from market and also within village.
10. Fifty four per cent female headed households against 70 per cent male headed households were practicing agriculture. Dairying was the major occupation found among 30 per cent female headed households against 20 per cent male headed.
11. Ninety six per cent females, heading the households had annual income between Rs/-8000-30,334 (low) as compared to 12 per cent male heads. None of the female respondents fell under the high income group, whereas 44 per cent male heads were earning medium and high income in each case i.e. more than 30,334 to 75000/-.
12. Female respondents were owning no land, were rearing 50 per cent goats, as compared to landless male headed households who were mainly rearing cows and buffaloes. Among the marginal land holders both set of households were rearing mainly buffaloes followed by cattle.
13. Majority of goats (35.24%) were reared by female headed households followed by desi buffaloes (32.38%) and desi cows (19.05%) as compared to males, who were rearing in majority the desi buffaloes (33.54%) followed by 25 per cent desi cows. Few respondents also had improved buffaloes and crossbred cows in their herd.
14. Fifty eight per cent of females, heading the households had a single species of animals either cattle, buffalo or goats. On the other side, male headed households owned large number of animals, more in combinations. Goats were reared in combination only by few families.

15. Neighbors were the major information sources of female respondents, heading the households (86%) followed by friends and relatives (64%) whereas 80 per cent of male headed households were seeking information from friends and relatives followed by neighbors (76%). Private agency staff and NGOs were used sometimes by male respondents, heading the households.
16. Statistically significant differences were observed in the information seeking behavior between female and male respondents of the sampled households.
17. In ninety per cent female headed households, information was shared mainly with neighbors followed by friends and relatives (76%) as compared to males who were sharing information with friends and relatives (72%) followed by neighbors (60%).
18. Local leaders, extension personnel, development department officers and university/Institute personnel were more frequently used by male respondents as compared to females.
19. Statistically significant differences were found in information sharing behavior between female and male headed respondents of the sampled households.
20. Ownership of television amongst male headed households as a mass media source was comparatively higher (30%) than female headed households. Radio was being used daily by majority of both set of respondents of the sampled households. Mobile phone, however were used by the respondents, as and when required.
21. Irrespective of respondents category, productivity of milch animals was found at medium level in both female and male headed households.
22. Twenty two per cent male headed households could achieve higher productivity of their milch animals in comparison to female headed households, wherein only 8 per cent had high productivity of their stock.
23. Significant differences were found in the means of early and peak milk yield of desi cows between the female and male headed households.

24. Milk yield of crossbred cows and desi buffaloes differed significantly in early, peak and late stages between female and male headed households. In case of improved buffaloes significant difference was observed only during the stage of peak milk yield.
25. No significant differences were found in the any stage of goats milk yield between female and male respondents of sampled households.
26. Forty per cent respondents of female headed households had joint ownership of buffaloes followed by cattle (34%) and thirty four per cent had single ownership of goats. In case of male headed households, 80 per cent respondents had single ownership of buffalo followed by cattle (56%).
27. Majority of respondents in female headed households had partial control over large ruminants and had complete control over small ruminant (goats) whereas males had complete control over large animals including cattle, buffalo and draft animals.
28. Independent participation of the female respondents, heading the household was more (86%) in mixing and giving feed to the animals as compared to male respondents, heading the households wherein only 20 per cent were independently doing this activity.
29. Taking animals for grazing in female headed household was being carried out exclusively by children (70%) whereas in male headed households, 48 per cent males were independently involved for grazing activity.
30. Participation of the women in female headed households were found to be 40 per cent independently in cutting of fodder and grasses as compared to males, whose participation was found to be 64 per cent.
31. Sixty two per cent children from female headed households were doing the activity of transportation of fodder/grasses from field whereas 70 per cent adult males were involved in male headed households for this activity.
32. Statistically significant differences were observed for the all the feeding related activities of their animals studied with respect to the level of involvement of female and male headed households.

33. Independent participation of the male headed households in providing A.I. service was upto 72 per cent whereas independent participation was found to be 32 per cent in female headed households.
34. Seventy six per cent males against 34 per cent females participated independently in taking the animal for natural service. About 80 per cent respondents came from male headed households participated independently for approaching the veterinarian for pregnancy diagnosis whereas female headed households, participation were found to the extent of 32 per cent independently.
35. Most of the animal health care related activities were managed by women independently amongst female headed households as compared to male respondents who were jointly involved with spouse or children in such activities.
36. Women respondents were less involved independently in taking the animals for vaccination (58%) as compared to male respondents (76%) of the sampled households.
37. Statistically significant differences were found with respect to participation for all the activities studied under health care of animals between the female and male headed households.
38. Sixty four to eighty two per cent females, heading their households were independently involved in cleaning of animal shed, milking of animals, dung collection, bathing and grooming of animals. In case of male headed households however, these activities were performed jointly with spouse or children.
39. Statistically significant differences were found with respect to participation in all the animal management activities of their animals between female and male headed households.
40. Ninety per cent females, heading their households were independently engaged in the preparation and processing of milk products as compared to male respondents whose engagement in such activities was found at low level.
41. Regarding marketing activities, 94 per cent male respondents were independently involved in sale and purchase of calf/kid, sale and purchase of animals (86%), disposal of milk at collection centre

(56%) and 40 per cent in record keeping as compared to female respondents, heading the households whose independent participation in marketing activities was found very less.

42. Significant differences were found with respect to the involvement of respondents hailing from female and male headed households for all the marketing activities of their animals.
43. The four top ranking activities of female headed households with respect to their involvement included preparation & processing of milk products followed by management, health care and feeding of animals and were ranked I, II, III & IV, respectively. For male respondents, ranking differed and ranked as breeding followed by marketing, health care and feeding of animals ranked I, II, III & IV, respectively in the male headed households.
44. Land holding in female headed households was found to be significantly correlated with their participation in dairy management practices while the remaining variables failed to attain the statistical level of significance.
45. Majority of the female headed households (93.94%) were purchasing fertilizer from market against 57 per cent respondents of male headed households, who were taking fertilizer from market and about 43 per cent from cooperatives.
46. Females and males owning land used the fodder seeds, dry fodder and concentrate of own field (64-75%).
47. Regarding animal health related inputs, majority of female respondents, heading the households purchased the dewormers from market and vaccines from block veterinary hospital. Mineral mixture and vaccines were taken from block veterinary hospital by more than half of male respondents.
48. Fodder seeds, dry fodder and concentrate were available for majority of female and male respondents within village. For half of the sampled respondents, dewormer was available at distance 3-5 kms from the village and vaccines were available at more than 5 kms distance from village for majority of females and males heading the households. Majority of males heading the households revealed that the mineral mixture was available at more than 5 kms.

49. Majority of female respondents had poor access to extension services (20%) and trainings (16%) as compared to male respondents heading their households, which had accessibility upto 64 per cent for both extension services and trainings.
50. More than half of the female respondents (60%) had no accessibility to public animal health services as compared to male respondents, wherein 80 per cent revealed their accessibility to public animal health services.
51. Forty two per cent of females, heading their households had easy accessibility to market for selling its produce as compared to 88 per cent male respondents.
52. Majority of females (80%) had access to non institutional sources of credit as compared to male respondents, who had better accessibility to institutional credit sources (44%) .
53. Female respondents, heading the households (80%) preferred to have credit from friends and relatives. Banks were preferred by 6 per cent of respondents as compared by males who in majority (44%) also preferred to have credit from banks.
54. Forty two to fifty six per cent of females, heading the households preferred quack followed by paravet (20-34%) for deworming and vaccination of their animals. Majority of males (50-64%) preferred block veterinary hospital for deworming and vaccination followed by A.I. (68%) as compared to women respondents (upto 80%) who preferred paravets.
55. Regarding treatment of animals, majority of female respondents preferred traditional healers (40%) followed by quack (30%) whereas, male respondents preferred paravet (40%) followed by block veterinary hospital (32%).
56. Irrespective of sampled households, non functioning of A.I. centre/ ill equipped A.I. centre was the 1st major constraint perceived by respondents for adopting the improved breeding practices of animals.
57. Scarcity of resources to maintain CB/superior breed of milch animals ranked II. Distance of veterinary hospital for PD was revealed IIIrd major constraint by 90 per cent female respondents, heading the households.

58. Inadequate knowledge about scientific feeding, high cost of ingredients of concentrates mixture and preference to grow cash crops instead of fodder crops were found to be the first, second and third major constraints in both set of respondents.
59. Lack of knowledge about common contagious diseases, their causes & control measures (Ist), ill equipped veterinary hospitals and lack of facility for treatment, vaccine etc. (IInd), lack of awareness and knowledge about importance of vaccination (IIIrd) were the major constraints perceived by female respondents, heading their households.
60. High cost/charge levied by veterinary staff for performing medical assistance (IVth), lack of awareness and knowledge about importance of health care (Vth) were the constraints perceived by women respondents under management and health care of dairy animals whereas male respondents revealed high cost/charge levied by veterinary staff for performing medical assistance as first and foremost constraints followed by ill equipped veterinary hospitals and lack of facility for treatment, vaccine etc. by 82 per cent respondents under management and health care of dairy animals.
61. Lack of awareness about women specific technology was found to be the first major constraint revealed by both set of respondents in adoption of improved dairy farm practices.
62. Lack of knowledge in making value added products, lack of contact with extension agent, lack of proper training guidance, low price of milk, high cost of inputs, non availability of dairy cooperative societies and lack of loan facilities and high rate of interest were several other major constraints in ascending order revealed by females, heading the households.

5.2 CONCLUSIONS

1. Females, heading their households not only performed the home chores but also participated in small scale dairy production system. Scale of operation was low due to low input, low quality stock, with low production and low income. Landless females, heading the households were more engaged in small scale dairying, had smaller herd size, comprised mainly small ruminants.

2. Men and women heads differed in types of breeds they owned within a given species. Men had improved animals whereas higher percentage of females, heading the households owned more number of desi cows and desi buffaloes. They had significantly higher number of goats (37) than male headed households (8). Draft animals were not at all kept by female headed households.
3. Female headed households owned lesser number of crossbred cow and improved buffalo (at an average of 0.22 and 0.06) than male headed households (0.36 and 0.2). In female headed households the animals were mainly acquired from non market channels as compared to male headed, who brought mainly from market and through different combination of modes.
4. Productivity of animals owned by female headed households was medium to low as compared to males wherein productivity scores were medium to higher. Thus there is considerable scope for improving the productivity of animals by awareing both on various aspect including the improved animal feeds, breeds, health etc. and also on crop livestock interventions in mixed small holding farms.
5. Female respondents, heading their households were more independently perform the indoor activities of dairy animal's production as compared to male headed households. They were more engaged in processing of milk products, management, health care and feeding activities while men were more involved in breeding, marketing and health care activities thus both differed significantly in their level of participation.
6. Female heads were playing major role in small scale dairy production and participated in most of the associated activities with existing techniques/practices barring few which led to low production of dairy animals. Thus it is imperative to include them in capacity building programmes for better management work productivity.
7. Male and female respondents, heading their households managed different type of animal species and were responsible for different activities with varying abilities, knowledge and information sharing. Thus research and extension system must consider the

gender while developing the technologies, methodologies for dissemination, refinement and support.

8. Female and male heads differed with respect to the ownership and control over animals owned by them. Female headed households had more joint ownership and partial control over large animals and single ownership of small animals with complete control.
9. Neighbors, friends and relatives were the major information seeking and sharing sources of female respondents, heading the households thus more depended on noninstitutional sources.
10. Female headed households had poor access to extension services and training as compared to male respondents. Also they had poor access to sell the livestock produce and institutional credit.
11. In female headed households, women were the main bread earner, thus priority needs to be given in accessing the credit on soft terms from financial institutions for setting up their small scale livestock enterprises as per their needs, interest and opportunities.
12. Female respondents heading the households preferred to have credit from friends and relatives and other non institutional sources as compared males who preferred more institutional sources over the noninstitutional.
13. Livestock health delivery services mostly addressed the males that lead more inequality of women. Rural women can easily avail the services if these are held near to her home.
14. In female headed households quacks and paravets were preferred for deworming and vaccination the animals and quack and traditional healers for treatment of sick animals whereas males preferred block veterinary hospital and paravets for these purposes.
15. Women and men animal keepers had different needs, interest and livelihood opportunities and constraints in managing the animals as well as in coping. Female heads faced more and different constraints in running the small scale dairy farming than males. However both did not differ significantly and ranked breeding, feeding, management and health care and other constraints as I, II, III and IV, respectively.

5.3 IMPLICATIONS AND RECOMMENDATIONS

1. The present study could assemble information and identified gaps on evidence base in small scale dairying that may likely to benefit female headed households and families through research & development interventions.
2. Livestock interventions could not benefit much to females thus appropriate gender specific interventions and approaches according to their level of participation at appropriate time targeting the female heads focusing on small ruminants and dairy animals is needed.
3. Women heads were playing multiple roles and economic contributions through managing small scale dairying, thus research, extension services and interventions must be focused for their overall development to bridge the gap and to enhance their participation and improving the animal productivity.
4. Lack of women's, access and control over assets related to dairy farming is a challenging task, thus interventions that may increase the women's access and right to these resources and then safeguarding from dispossession to empower them.

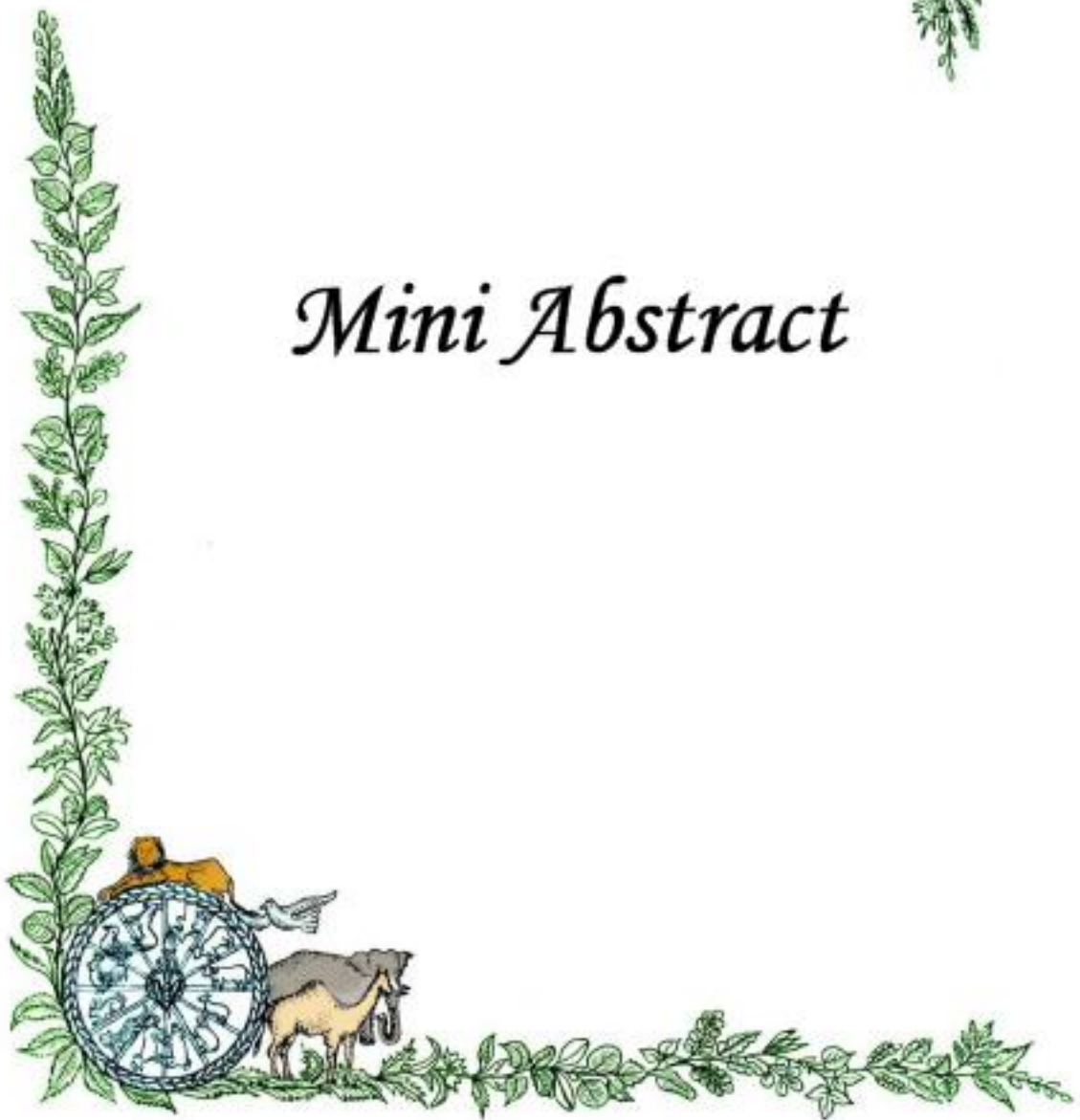
5.4 SUGGESTED AREAS FOR FUTURE RESEARCH

1. Similar study may be conducted in other regions of India to strengthen the findings so as to have a better insight of dairying as a source of livelihood.
2. An exclusive study on the constraints in dairy farming may be conducted to have a better insight of the problems perceived by the women in female headed households.

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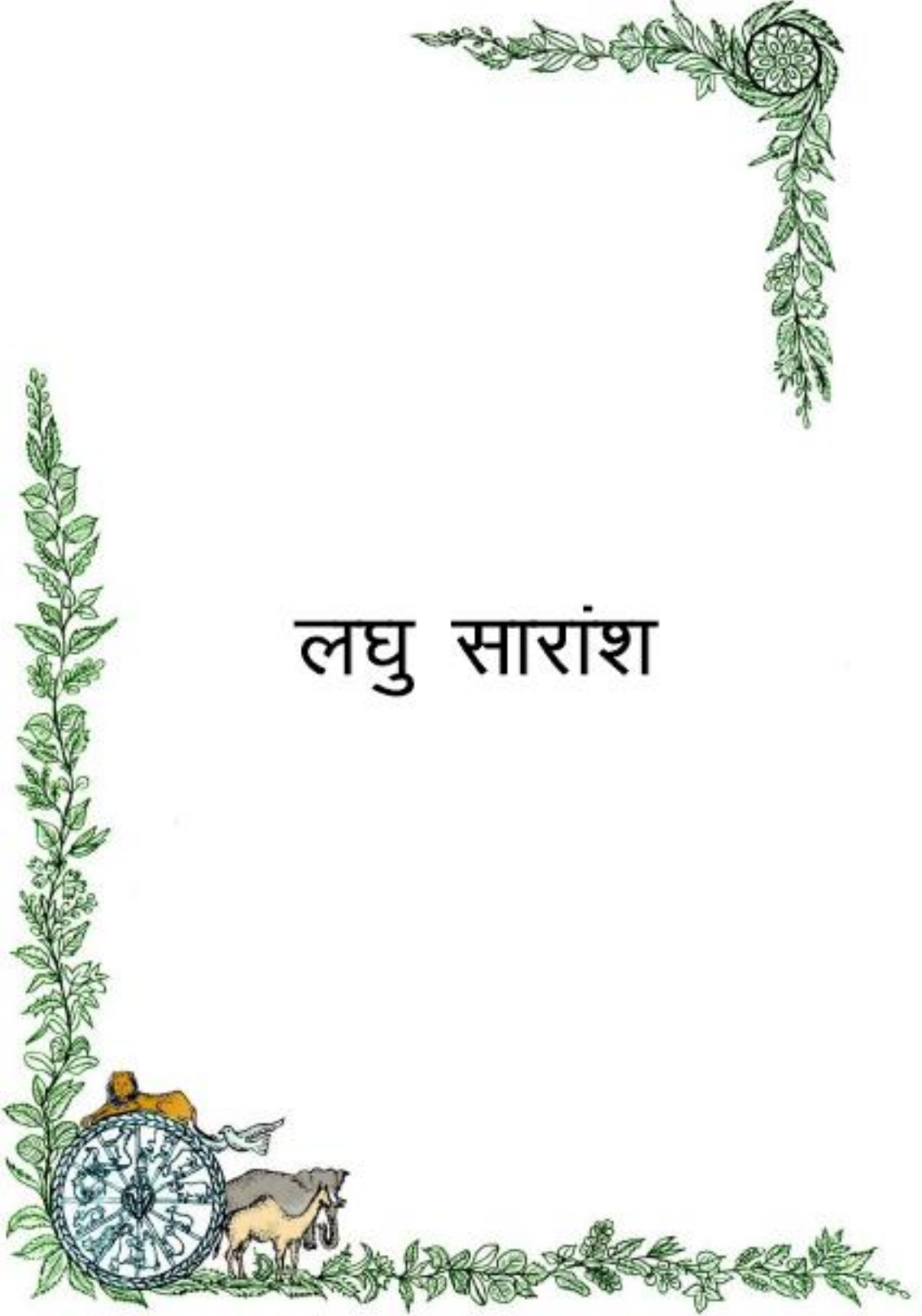
Mini Abstract



The present study has been conducted in randomly selected five blocks of Bareilly district of Uttar Pradesh. Data were collected personally through interview schedule from 100 distinct households (50 female headed + 50 male headed) from 5 different clusters comprising 50 villages from 5 different blocks of Bareilly district supported with observations, interaction etc.

The study revealed that the majority of the respondents belonged to middle age group, had marginal land holding, agriculture and animal husbandry as their major occupation. Majority of female headed households had small herd size, purchased within village as compared to male headed households, who had medium herd size and purchased through different mode of combination. Majority of females, heading the households (58%) were depended on single animals either cattle, buffalo or goats whereas male headed households, owned large animals more in combinations. Neighbors (86-90%), friends and relatives (64-76%) were the major information seeking and sharing sources of the female respondents. Both households had medium level of productivity of their milch animals. Participation of female headed households in small scale dairying activities of animals revealed that they mostly engaged in indoor activities like preparation & processing of milk products (I), management (II), health care (III) and feeding of animals (IV). Low participation was found in breeding and marketing related activities of dairy animals whereas, male respondents participation was different. It was highest in breeding ranked 1st followed by marketing, health care and feeding of animals. Statistically significant differences were found for all the small scale dairying activities studied with the level of participation between the female and male headed households. Forty per cent of the female headed households had joint ownership for the large ruminants and single for small ruminants (34%). Regarding control majority of respondents had partial control over large ruminants (74%) and had complete control over small ruminant (100%). Females owning land used the fodder seeds, dry fodder and concentrate of their own field. Animal health related inputs and dewormers were purchased mainly from market and vaccinated the animals through block veterinary hospital. Majority of female respondents had poor access to extension services (20%) and training (16%) as compared to male respondents, who had better accessibility to these services. Majority of the female respondents were not having accessibility to public animal health services (60%). Regarding access to credit, the study revealed that females had access to non institutional sources of credit (80%) as compared to male respondents, who had better accessibility to institutional credit sources (60%). Majority of female respondents, heading their households preferred to have credit from friends and relatives (80%). Regarding treatment of animals, 40 per cent of female respondents preferred traditional healers followed by quack (30%) whereas, male respondents preferred paravets (40%) and block veterinary hospital (32%). Female heads faced more and different constraints in running the small scale dairy farming than males. However both households did not differ significantly and ranked breeding, feeding, management and health care and other constraints as I, II, III and IV, respectively.

लघु सारांश



वर्तमान अध्ययन उत्तर प्रदेश के बरेली जिले के 5 विभिन्न विकास खण्डों में किया गया। आंकड़ों का संग्रह व्यक्तिगत साक्षात्कार द्वारा अधिसूचित प्रश्नावली के माध्यम से 100 विभिन्न परिवारों (50 महिला मुखिया परिवार + 50 पुरुष मुखिया परिवार) से किया गया। परिवारों के चयन हेतु 50 गांवों से 05 समूह (cluster) बनाये गये। प्रत्येक समूह से 10 महिला मुखिया तथा 10 पुरुष मुखिया परिवारों का चयन किया गया।

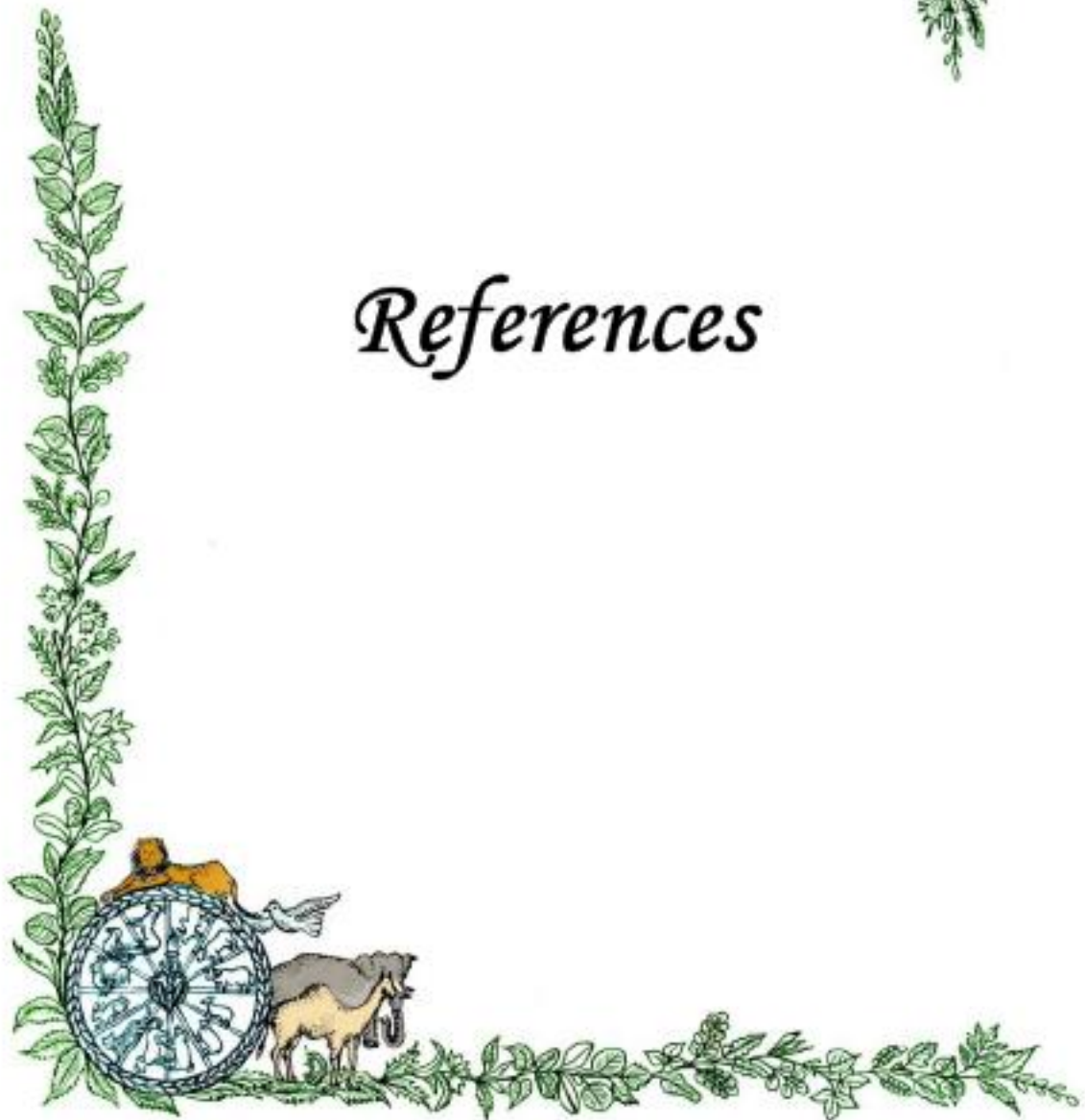
अध्ययन से ज्ञात हुआ कि अधिकांश उत्तरदाता मध्यम आयु वर्ग के थे जिनका प्रमुख व्यवसाय छोटी जोत वाली कृषि और पशुपालन था। अधिकतर महिला मुखिया परिवार छोटे आकार के थे, जबकि पुरुष मुखिया परिवार मध्यम आकार के थे। अट्ठावन प्रतिशत महिला मुखिया परिवार एक ही प्रजाति के पशु पालते थे जिनमें गाय, भैंस और बकरियाँ थी, जबकि पुरुष मुखिया घरों में बड़े पशुओं को अधिकतर संयोजित रूप से पालते थे। 85-90 प्रतिशत महिला मुखिया परिवार पड़ोसियों से और 64-76 प्रतिशत मित्र एवं सगे सम्बन्धियों से डेयरी सम्बन्धित जानकारी प्राप्त करते थे। दोनों तरह के परिवारों के पशुओं का दुग्ध उत्पादकता का स्तर मध्यम था। महिला मुखिया परिवारों में छोटे स्तर की डेयरी में भागीदारी से ज्ञात हुआ कि वे अधिकतर घर में ही रहकर दुग्ध उत्पादों की तैयारी एवं प्रसंस्करण, पशुओं का प्रबन्धन, पशुओं की स्वास्थ्य सम्बन्धी देखभाल और पशुओं का दाना चारा देने में व्यस्त रहती थी। महिला मुखियाओं की पशुओं के प्रजनन एवं विपणन संबंधी कार्यों में कम भागीदारी थी जबकि पुरुष प्रधान परिवारों की पशुओं के प्रजनन में भागीदारी अग्रणीय थी उसके बाद विपणन, स्वास्थ्य देखभाल और पशुओं को चारा खिलाने में पाई गयी। सभी छोटे स्तर की डेयरी के कार्यों में महिला और पुरुष प्रधान परिवारों के बीच भागीदारी के स्तर में महत्वपूर्ण सांख्यिकी अंतर पाया गया।

चालीस प्रतिशत महिला मुखिया परिवारों में बड़े पशुओं का संयुक्त स्वामित्व था और 34 प्रतिशत छोटे पशुओं का एकल स्वामित्व था। 74 प्रतिशत महिला मुखिया परिवारों का बड़े पशुओं पर आंशिक नियंत्रण था जबकि छोटे पशुओं पर पूर्णतया नियंत्रण था।

महिलाएं जिनके पास जमीन थी वे हरा सूखा चारा एवं दाना अपने ही खेतों का प्रयोग करती थीं। महिलाएं पशुओं की स्वास्थ्य संबंधी सामग्री और पेट के कीड़ों की दवाई मुख्यतः बाजार से खरीदती थीं और ब्लाक में पशुचिकित्सा अस्पताल से टीकाकरण करवाती थीं। पुरुष उत्तरदाताओं की पहुँच प्रसार सेवाओं एवं प्रशिक्षण में 64 प्रतिशत और 80 प्रतिशत सार्वजनिक पशु स्वास्थ्य सेवाओं में थी जबकि महिला उत्तरदाताओं की पहुँच 20 प्रतिशत प्रसार सेवाओं, 16 प्रतिशत प्रशिक्षण और 40 प्रतिशत सार्वजनिक पशु स्वास्थ्य सेवाओं में थी। ऋण सम्बन्धी अध्ययन करने पर ज्ञात हुआ कि 80 प्रतिशत महिलाओं में गैर संस्थागत स्रोतों से ऋण लेने की पहुँच थी तथा मित्रों एवं सगे सम्बन्धियों से ऋण लेने को प्राथमिकता देती थीं जबकि 60 प्रतिशत पुरुष उत्तरदाताओं में संस्थागत ऋण स्रोतों के लिये बेहतर पहुँच थी। पशुओं के उपचार संबंध में 40 प्रतिशत महिलाएं परम्परागत तरीकों, 30 प्रतिशत झोलाछाप डाक्टरों को प्राथमिकता देती थीं, जबकि 40 प्रतिशत पुरुष पेटावेट को और 32 प्रतिशत पशुचिकित्सालयों को प्राथमिकता देते थे। महिलायें छोटे पैमाने की डेयरी की उन्नत तकनीकों को अपनाने में अधिकतर कठिनाइयों का सामना करती थीं जिनमें प्रथम स्थान पर पशुओं के प्रजनन संबंधी, दूसरे स्थान पर चारा दाना संबंधी और तीसरे स्थान पर स्वास्थ्य देखभाल और प्रबंधन संबंधी कठिनाइयों का सामना करती थीं। महिला एवं पुरुष परिवारों द्वारा छोटे स्तर पर पशुपालन करने हेतु दर्शाई गयी समस्याओं में विशेषतः कोई भिन्नता नहीं पाई गई।



References



Chapter-8

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Annexure

Annexure

ANNEXURE - I

Division Of Extension Education
Indian Veterinary Research Institute
Izatnagar Bareilly (U.P.) 243122

INTERVIEW SCHEDULE

on
**Contribution Of Female Headed Households In Small Scale Dairy
Production System: A Gender Perspective**
(Female Headed / Male Headed)

Serial No. _____ Date _____
Cluster No. _____ Name of village _____ Name of Block _____

Name of the respondent _____

1. Age (Yrs.) _____

2. Religion _____

3. Caste _____

4. Education

Illiterate / Can read only / Can read and write / Primary / Middle school / High school /
Graduate / Above

5. Marital status

Married / Divorced / Widow / Unmarried

6. Family size _____

7. Particulars about the family members

Sl. No.	Relationship	Age	Education	Occupation
	Self			

8. Family land holding (Bighas) _____ Land under cultivation (Bighas) _____

9. Livestock holding

Sl. No.	Species	Category	Crossbred	Local	Total
1.	Cattle	a. Milch b. Dry c. Young stock			
2.	Buffalo	a. Milch			

- | | | |
|----|---------|--|
| 3. | Goat | b. Dry
c. Young stock
a. Milch
b. Dry
c. Young stock |
| 4. | Sheep | a. Milch
b. Dry
c. Young stock |
| 5. | Drought | a. Bullock
b. Buffalo bullock |
| 6. | Pig | |
| 7. | Poultry | |

10. Mode of acquisition of livestock:

Name of livestock	Gift	Inherited them from family members	Rearing and return	Purchased from market	Purchased within village	Combination of modes
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11. Major occupation:

Crop farming / Livestock rearing / Govt. service / Laborer / Private service

12. Annual household income:

- a. Income from sale of milk: Rs _____/ annum
 b. Income from sale of calves/kids: Rs _____/ annum
 c. Income from sale of dung: Rs _____/ annum
 d. Income from agriculture crops: Rs _____/ annum
 e. Income from other sources: Rs _____/ annum

13. Input delivery systems and its accessibility: (Please let me know if provisions for the following inputs for your dairy animals are available.)

Sl. No.	Inputs	Agency delivering inputs	Distance of availability			Regularity		Accessibility	
			Within village / 2kms	3-5 kms	More than 5kms	Regular	Irregular	Yes	No
1.	Green fodder								
2.	Concentrate feed								
3.	Mineral mixture								
4.	Fodder seeds								
5.	Fertilizer								
6.	Vaccination facility								
7.	A.I. facility								
8.	Treatment facility								
9.	Training facility								
10.	Credit facility								
11.	Extension services facility								
12.	Market facility								

14. Gender role in livestock production activities:

Sl. No.	Type of activities	Participation				
		Independent		Joint		Other
		Male	Female	% of Male	% of Female	
A.	Feeding					
	a. Mixing & giving feed to the animals					
	b. Giving water to the animals					
	c. Taking the animals for grazing					
	d. Cutting of grasses /fodder for animals					
	e. Transporting of grasses/fodder from fields					
B.	Breeding					
	a. Observing the animal when comes into heat					
	b. Taking animal for A.I.					
	c. Taking animal for natural service					
	d. Taking animal for pregnancy diagnosis					
C.	Health care					
	a. Care of new born calf/kid					
	b. Care of sick animals					
	c. Care of animal during pregnancy					
	d. Taking animal for vaccination					
	e. Taking animal for treatment of diseases by V.O.					
	f. Apply /give medicines to animal at home					
D.	Management					
	a. Cleaning of animal shed					
	b. Milking of animal					
	c. Collection of dung					
	d. Bathing/grooming of animals					
E.	Preparation & processing of milk products					
F.	Marketing					
	a. Selling and purchasing of animals					
	b. Selling of calf/kid					
	c. Disposal of milk at collection centre					
	d. Record keeping					

15. Ownership and control over livestock and related resources:

Sl. No.	Species of animals	Ownership			Control	
		Single	Joint	No	Complete	Partial
1.	Cattle					
2.	Buffalo					
3.	Goat					
4.	Sheep					
5.	Draft animal					
6.	Poultry					
7.	Pig					
8.	Other resources					
	a. Grazing land					
	b. Cultivable land					
	c. Water bodies					
	d. Family labor					
	e. Management of labor					

f. Management of revenue earned
from sale of produce

16. **Information seeking behavior:** (Please indicate how often you approach the following sources (persons, agencies) for getting information regarding small scale dairy production.)

Sl. No.	Sources of information	Always	Some times	Never
1.	Friends & relatives			
2.	Neighbors			
3.	Gram pradhan			
4.	Progressive farmers			
5.	Local leaders			
6.	Extension personnel			
7.	Development dept.officers (BDO, DDO, VDO, VO etc.)			
8.	University /Institute personnel			
9.	Private agency staff.			
10.	NGOs			
11.	Others(specify)			

17. **Information sharing behavior:** (Please indicate with whom you share the information about the small scale dairy production.)

Sl. No.	Sources of information	Always	Some times	Never
1.	Friends & relatives			
2.	Neighbors'			
3.	Gram pradhan			
4.	Progressive farmers			
5.	Local leaders			
6.	Extension personnel			
7.	Development dept.officers (BDO, DDO, VDO,VO etc.)			
8.	University /Institute personnel			
9.	Private agency staff.			
10.	NGOs			
11.	Others(specify)			

18. **Mass media ownership and frequency of use:** (Kindly indicate as to what extent you have used the following mass media for acquiring information about the small scale dairy farming.)

Sl.No.	Medium	Ownership		Frequency of use				
		Yes	No	Daily	Weekly	Monthly	Never	As per need
1.	Radio							
2.	Newspaper							
3.	Magazine							
4.	T.V.							
5.	Mobile phone							
6.	Any other							

19. **Constraints in technology adoption:** (Please indicate the degree of agreement with respect to the following constraints in adoption of dairy farming technology as perceived by you)

Sl. No.	Constraints	Major constraint	Minor constraint	Not a constraint
A.	Feeding			
1.	Inadequate knowledge about scientific feeding			
2.	Preference to grow cash crops instead of fodder crops			
3.	Inadequate resources for cultivation of fodder crops round the year			
4.	High cost of ingredients of concentrates mixture/compound feed			
5.	Poor availability of HYV fodder seeds/perennial roots			
6.	Under feeding due to limited financial resources			
7.	Lack of grazing land facilities			
B.	Breeding			
1.	Non functioning of A.I. centre/ill equipped of A.I. centre			
2.	Lack of good breedable bulls for natural service			
3.	Inadequate knowledge and poor appreciation for A.I. services			
4.	Low genetic potential of local animals			
5.	Poor conception rate and treatment of repeater is not rewarding			
6.	Scarcity of resources to maintain CB/superior breed of milch animals			
7.	Distance of veterinary hospital for PD			
C.	Management and health care			
1.	Lack of knowledge about common contagious diseases, their causes & control measures			
2.	Lack of awareness and knowledge about importance of health care			
3.	Lack of awareness and knowledge about importance of vaccination			
4.	Veterinary hospitals are ill equipped, lacking facility for treatment, vaccine etc.			
5.	Lack of proper knowledge about right time of drying up pregnant animal			
6.	High cost/charge levied by veterinary staff for performing medical assistance			
D.	Others			
1.	Non availability of dairy cooperative societies			
2.	Lack of loan facilities and high rate of interest			
3.	Low price of milk			
4.	Lack of knowledge in making value added products			
5.	Lack of awareness about women specific technology			
6.	High cost of inputs			
7.	Lack of proper training guidance			
8.	Lack of contact with extension agent			

20. **Productivity of milch animals:** (Please let me know the milk production of your milch animals in previous lactation)

Sl.No.	Early		Peak		Late		Average	
	Yield (Litre)	Days (No.)	Yield (Litre)	Days (No.)	Yield (Litre)	Days (No.)	During lactation (Litre)	Per day (Kg)
Desi cow								
1.								
2.								
3.								
Crossbred cow								
1.								
2.								
3.								
Desi buffalo								
1.								
2.								
3.								
Improved buffalo								
1.								
2.								
3.								
Goat								
1.								
2.								
3.								

ANNEXURE - II

Male & Female headed households

Sl. No.	State/UT	Male Head	Female head
1.	India	173,131,502	19,987,858
2.	Andaman & Nicobar Islands	70,190	7,605
3.	Andhra Pradesh	15,040,480	1,920,951
4.	Arunachal Pradesh	191,574	21,873
5.	Assam	4,399,834	501,789
6.	Bihar	12,708,747	1,012,794
7.	Chandigarh	191,083	14,809
8.	Chhattisgarh	3,634,361	450,416
9.	Dadra & Nagar Haveli	42,572	2,858
10.	Daman & Diu	28,867	6,690
11.	Delhi	2,490,004	238,090
12.	Goa	231,587	62,171
13.	Gujarat	8,889,929	777,962
14.	Haryana	3,406,263	299,198
15.	Himachal Pradesh	1,000,468	218,594
16.	Jammu & Kashmir	1,455,738	105,929
17.	Jharkhand	4,390,283	398,933
18.	Karnataka	8,938,309	1,441,807
19.	Kerala	5,199,358	1,514,107
20.	Lakshadweep	6,528	3,429
21.	Madhya Pradesh	10,078,562	814,667
22.	Maharashtra	17,545,691	1,976,118
23.	Manipur [@]	324,404	49,074
24.	Meghalaya	321,330	95,841
25.	Mizoram	153,896	21,720
26.	Nagaland	296,151	29,921
27.	Orissa	6,943,828	776,322
28.	Pondicherry	182,172	32,928
29.	Punjab	3,919,417	418,948
30.	Rajasthan	8,651,886	644,547
31.	Sikkim	102,936	11,061
32.	Tamil Nadu	12,582,076	2,041,997
33.	Tripura	590,357	73,305
34.	Uttar Pradesh	23,656,040	2,031,752
35.	Uttaranchal	1,336,183	260,279
36.	West Bengal	14,130,398	1,709,373

Source: Census of India 2001.

ANNEXURE - III

Cattle equivalents for different categories of livestock

Sl. No.	Categories	Cattle equivalent
1.	Cattle in milk	
	Indigenous	1.00
	Crossbred	1.19
2.	Cattle heifer	
	Indigenous	0.65
	Crossbred	0.85
3.	Dry adult cattle	
	Indigenous	0.80
	Crossbred	0.85
4.	Cattle and bulls	
	Indigenous	0.40
	Crossbred	0.48
5.	Oxen and bulls	1.26
6.	Buffalo in milk	1.26
7.	Buffalo heifer	0.69
8.	Dry adult buffalo	1.01
9.	Buffalo bulls and working stock	1.26
10.	Goat/sheep	0.10
11.	Pig	0.10
12.	Horses/ponies/camel	2.67
13.	Poultry (100 adult birds)	0.005

Source :

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