KHILLAR CATTLE OF KARNATAKA – A DESCRIPTIVE STUDY

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CERTIFICATE

This is to certify that the thesis entitled **"*KHILLAR CATTLE OF KARNATAKA- A DESCRIPTIVE STUDY"*** submitted by **Mr. RAJASHEKHAR KARJOL.,** I.D. No. **MVHK 1933** for the award of **MASTER OF VETERINARY SCIENCE** in **VETERINARY AND ANIMAL HUSBANDRY EXTENSION EDUCATION** to the Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar, is a record of research work carried out by him during the period of his study in this university under my guidance and supervision and the thesis has not previously formed the basis for the award of any degree, diploma, association ship, fellowship or other similar titles.

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Affectionately Dedicated to

My Parents

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LIST OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION
GDP	Gross Domestic Product
GOI	Government of India
KVK	Krishi Vigyan Kendra
MS	Mean score
NGO	Non-Government Organization
OBC	Other Backward Class
PUC	Pre- University College
SC	Scheduled Caste
ST	Scheduled Tribe
TV	Television
%	Percentage
/	Per
F	Frequency
N	Sample size

Introduction

I. INTRODUCTION

Livestock rearing is one of the most important economic activities in the rural areas of India which contributes 4.11 per cent to the national GDP and 25.6 per cent to total agriculture GDP (Economic Survey of India, 2021) by providing protein rich products such as milk, meat and eggs for human consumption. It also provides supplementary income to most of the families dependent on agriculture and allied activities including the landless and marginal farmers. It is also found that families with land holding size less than 4 hectares own around 88 per cent of the livestock. Among this, about 37 per cent of the livestock is owned by the families with land holding size less than a hectare. Apart from providing a subsidiary income, it also provides employment to about 8.8 per cent of the population in India. (Dighe, 2018).

India has a rich source of cattle and buffalo genetic resources comprising of 50 breeds of cattle and 19 breeds of buffaloes (NBAGR-2015) which help in creating the livelihood security to the resource poor farmers and these are well known for their robust nature, draught power, disease resistance, feed conversion efficiency, drought resistance and ability to thrive on poor quality feed and fodder. Among different indigenous cattle in Karnataka, Khillar is a predominant indigenous cattle breed in the region. Although, milk production of these indigenous cattle breed is low as compared to crossbreds, these animals are reared for their sturdy nature, sustainability to draught, heat tolerance, disease resistance, adaptability to harsh climatic conditions and ability to survive and perform under scarce feed and fodder conditions (Gokhale *et al*, 2008). However, scanty published information on production, reproduction and draught ability on small number of animals

maintained at organized farms are insufficient to understand the extent of potential of breed and is inadequate for planning for its improvement.

The Khillar cattle breed is a member of the *Bos-indicus* sub-species, native to Satara, Kolhapur and Sangli districts in Maharashtra and Bijapur, Dharwad and Belagavi districts of Karnataka in India. There are four sub types of Khillari breed such as; i) Atapadi Khillar; ii) Mhaswad Khillar; iii) Tapi Khillar and iv) Nakali Khillar. 'Khillari' means a herd of cattle and the herd man is known as 'Khillar' or 'Thillari'. The Khillar breed is well adapted to the area's tropical and drought-prone conditions which are preferred by the local farming community due to their ability to handle the hardships of farming. The breed population is declining mostly due to low milk yield, which offers an alternate income stream. Besides their extensive use in their home tracts, they are also distributed in Haveri, Kalaburagi, Gadag, Uttara Kannada and Bagalakote districts of Karnataka. The total population of Khillar breed in Karnataka is 7,20,360. The highest population of Khillar breed is distributed in Belagavi, Kalaburagi, Vijayapur and Haveri (GOI-Breed survey, 2013).

Further, with regards to draftability of Khillar breed, it is noted that despite lot of advancements in the use of mechanical power in Indian agricultural operations, the Indian farmers especially in rural areas still depend upon bullocks for various agricultural operations. The bullocks are saving a lot on fuel which is a necessary input for using mechanical power like tractors, combine harvester etc. Further, dung and other animal wastes serve as very good farm yard manure for agriculture production.

Despite having several benefits for the farmers, there are many challenges involved in keeping the Khillar cattle because of their lower milk production, decrease in demand for draught animal power, decreased draught animal work days etc. Hence, there is an urgent need to assess and analyze the contribution of indigenous cattle in the livelihood of resource poor which may help the policy makers and different planning agencies to design relevant development programs targeted for indigenous cattle rearing farmers. In this context, the present study was conducted with the following specific objectives:

- To study the socio economic and psychological characteristics of livestock farmers owning Khillar cattle of Karnataka
- To analyze the utilization pattern of Khillar cattle among different categories of farmers
- To identify the marketing pattern of Khillar cattle of Karnataka.
- To find out the constraints faced by the livestock farmers in management of Khillar cattle of Karnataka.

Review of Literature

II. REVIEW OF LITERATURE

Comprehensive review of literature is an essential component of any research endeavour. It helps the researcher to get acquainted with the past and contemporary research in the particular field of investigation. Keeping in view the scope of the study and its objectives, the available literature is presented under different heads as under;

2.1 Socio economic dimensions of Khillar farmers

2.2 Utilization pattern of Khillar cattle

2.3 Marketing pattern of Khillar cattle

2.4 Constraints in management of Khillar cattle

2.1 SOCIO ECONOMIC DIMENSIONS OF KHILLAR FARMERS

Akila (2009) studied the utilization pattern of draught animals in Tamil Nadu and found that majority of the farmers rearing draught animals were middle aged (69.05%), illiterates (28.57%), with medium level of farm experience (62.38%) and knowledge in the management of draught animals (68.57%), lived in joint family (53.8%) with medium family size (75.71%) and received medium source of information (67.62%). Cent per cent of the farmers expressed that keeping bullocks gives social prestige in the society. An overwhelming majority of the respondents had agriculture as their main occupation (87.62%) and 41.43 per cent had animal husbandry as secondary occupation with medium herd size (67.14%), medium draught animal composition (68.57%) and majority availed farm power by draught bullocks in combination with tractors (47.62%).

Thombre *et al*. (2010) studied the farmers opinion about rearing of Deoni cattle and found that majority of the respondents were middle aged (51.67%) having nuclear family (65.00%) with small family size (46.67%). Majority of the farmers had primary school education (28.33%) with agriculture as their primary occupation (78.33%) getting medium annual income (58.33%).

Gokhale and Bhagat (2012) studied the status of Krishna Valley cattle and observed that they were reared by farmers belonging to Bijapur and Bagalakot districts of Karnataka. Farmers of Bagalakot were less literate than Bijapur farmers and overall 38.64 per cent animal owners were illiterates. The mean landholding per family was found to be 7.61 acres and the extent of irrigation was larger in Bagalkot district (72.08%) compared to Bijapur (27.97%) district.

Verma (2013) studied the utilization pattern and conservation measures for Kherigarh breed of cattle in Uttar Pradesh and reported that majority of respondents were men (93.33%), middle aged (39.17%) and belonged to OBC (60.00%) category. Nearly 30 per cent of respondents had primary school education and had agriculture as primary occupation. Sixty per cent of farmers lived under joint family and with a medium (8 -11 members) family size. More than 50 percent of respondents were members of atleast one social organization with low social participation (57.5%) and majority had marginal landholding (67.5%) with medium livestock rearing experience (38.33%).

Chandran *et al*. (2014) studied the socio-economic status of farmers and economics of rearing of Bachaur cattle in its habitat under middle Gangetic plains. The study revealed that 29.70 per cent of farmers practiced agriculture, apart from rearing cattle and their

literacy rate was ranging from 21.39 to 57.14 per cent. Marginal, small, semi-medium and medium farmers earned 91.40, 89.90, 86.31 and 87.22 per cent, respectively from draught power of Bachaur cattle. Rearing of Bachaur bullocks supported the income of marginal, small and semi-medium farmers to the tune of 50.12, 48.31 and 42.66 per cent, respectively.

Motiang and Webb (2014) conducted a study on socio-economic analysis of breed utilization in South Africa, which revealed that the majority of respondents were men (77%) of ages ranging between 24 and 86 with an average of 56 years. Male-headed households owned larger herds of cattle and were more dependent on income from other livestock than the households headed by women. Male household heads also tend to be more commonly affiliated with community associations where they hold office. On the other hand, female producers were more inclined to rear exotic and non-descript breed types.

Vivek (2014) conducted a study on a critical appraisal of the management practices of Deoni cattle in Bidar district and observed that, majority of the respondents were middle aged (56.50%) having nuclear family (66.50%) with small family size (53.50%). Majority of the farmers had primary school education (53.50%), belonged to OBC category (80.50%) with agriculture as their primary occupation (71.50%) and medium annual income (54.50%).

Kuralkar *et al,* (2015) studied the Status, management practices and performance in three strains of Deoni breed of cattle and reported that the average family size of Deoni cattle owners was 7.02. The literacy rate of the family members revealed that 59.84 per

cent were literate and 40.16 per cent were illiterates. According to occupation, majority of Deoni cattle owners were agriculturists (67.18%). The land holding capacity of Deoni cattle owners were marginal (16.41%), small (22.80%), semi-medium (22.45%) and medium (16.75%). The community wise distribution showed that most of the Deoni cattle owner belonged to OBC (62.30 %) followed by scheduled tribes (17.13 %).

Viswanatha Reddy *et al.* (2016) conducted a study to investigate the socioeconomic profiles of livestock farmers in North Goa district of Goa. Results revealed that majority had a nuclear family (59.00%). About 60 per cent of the livestock farmers belonged to general category, 34 per cent to backward category and remaining 6 per cent to scheduled castes and scheduled tribes. Majority of the farmers were involved in livestock activities (82.00%) with secondary and intermediate education (74.00%). Around 58 per cent were marginal farmers, followed by small (26%) and medium (14%) farmer category.

Kauthale *et al.* (2019) studied the socio-economic status of red Kandhari cattle rearing farmers in Kandhar block of Nanded district in Maharashtra and revealed that majority of the farmers lived in nuclear type of families (64.56%) and owned 61.61 per cent Red Kandhari cattle. Around 64.56 per cent households were having small family size with 1-5 members and had small land holding (60.13%). Majority of the farmers had livestock farming as their main source of livelihood (88.07%), were literates (79.64%) with small herd size and were rearing animals for both milk and draught purpose (48.95%).

2.2 UTILIZATION PATTERN OF KHILLAR CATTLE

Gokhale *et al*. (2009) in their study on morphometric characteristics and utility pattern of Khillar cattle in the breed tract, reported that in Satara, Sangli and Solapur

districts of Maharashtra, Khillar cattle were mainly used for agricultural operations (61.17%), for exhibitions and race purpose (4.74%), for breeding purpose (2.86%) and for religious purposes (0.64%).

Akila and Chander (2010) studied the utilization pattern of draught breeds in Tamil Nadu and reported that 91.43 per cent of large farmers maintained the animals mainly for their own use whereas, small farmers utilized their bullocks for ploughing in others' field (28.57%), commercial carting (25.71%) and for both the activities (45.71%), while 35.71 per cent of medium farmers were using their bullocks for commercial carting apart from their own use. They also reported that draught bullocks were still a main source of farm power for small farmers, to certain extent for medium farmers and for certain operations for large farmers.

Gadekar *et al*. (2017) studied the utilization pattern of draught animal power by different categories of farmers and their suggestions regarding efficient use of draught animals and reported that operations like ploughing was completed by the farmers using different energy sources like own bullock-pairs (22.92%), tractor and bullocks (73.75%). Transportation operation was completed by the farmers using different energy sources like own bullock-pairs, hired bullock-pairs, tractor and bullock or tractor (55.83%, 22.50%, 11.25% & 10.42% respectively).

Wagh *et al.* (2017) studied the present scenario of draught animal power utilization in Aurangabad district and concluded that majority of the small farmers conducted inter cultivation operations by using their own bullock energy (63.33%) and on an average about 26.67 per cent of farmers completed the inter cultivation operation by using hired bullock

energy. Overall 13.33 per cent of farmers utilized bullocks as well as tractor energy for inter cultivation operations. Among all the respondents, marginal, small, medium, and large farmers utilized own bullocks for the transportation (31.67%, 63.33%, 80.00% and 66.67% respectively). An average of 22.50 per cent of respondents used hired bullock energy for transportation and on an average about 10.83 per cent of farmers depended on tractors to carry the transport operation. Overall 6.25 per cent farmers utilized bullocks as well as tractor energy for transportation operations.

2.3 MARKETING PATTERN OF KHILLAR CATTLE

Khan and Rao (1998) while studying the cattle marketing in Karnataka revealed that the majority of the farmers were not satisfied with the pricing of their animals. The study revealed that the brokers often adopted unfair practices and also revealed that the infrastructure facilities available in the markets were inadequate.

Sharma and Singh (1998) studied the organizational and operational structure of the regulated cattle markets of Rajasthan and classified all the cattle fairs into two categories, namely, state cattle fairs and local panchayat cattle fairs. They reported that all the 12 state cattle fairs were regulated and organized by government of Rajasthan. It was observed that the price was fixed by direct negotiation between the sellers and buyers and brokers were not involved in the marketing of livestock. Market arrivals mainly consisted of camel, cattle and buffalo.

Rajarajan (2000) studied different constraints in the marketing of milch animals in Coimbatore district of Tamil Nadu state and reported, non-remunerative prices as the most important constraint. Other major constraint faced by the sellers were absence of market

regulation, lack of infrastructure facilities, high market charges, exploitation by middlemen, inadequate transportation facilities and lack of market information in descending order. The most important constraint faced by the buyers were the malpractices adopted by the sellers and traders. Other constraints faced by them were high market charges, lack of hygiene and sanitation in the market, lack of basic amenities, lack of facilities for assessing the quality parameters and grading and overcrowding of animals in the market yard.

Akila and Chander (2010) studied the management practices followed for draught cattle in different agro-climatic zones of Tamil Nadu and found that 86 per cent of the respondents purchased draught cattle from the livestock markets and procurement from neighbours (7.00%) and middlemen (7.00%) was limited. Majority of the farmers selected animals based on their physical characteristics like body conformation, presence and position of hair whorls. They also reported that draught cattle was used for only 30-90 days for agricultural work especially during monsoon season and for commercial carting in the remaining days. Farmers, when they did not have enough work for the animals, were kept idle, adding up to maintenance costs and thus becoming a burden to farmers.

Mahesh (2013) conducted a study on efficiency of cattle markets in eastern dry zone of Karnataka and reported that prize won in the competition, presence or absence of undesirable marks, breed characteristics, general appearance and age (number of front teeth and horn rings) had significant impact on the price of bullock.

Sudeep Kumar *et al*. (2015) conducted a study on development of valuation index for draught cattle breed of Tamil Nadu and opined that draught cattle were marketed mainly

in shandies, cattle fairs and at home directly to buyers / farmers or with the help of brokers / commission agents. The valuation of these animals was not fixed on scientific basis but through a traditional method “Hatha” where the process of negotiation on pricing the animals was hidden. As bullocks are exclusively meant for draught purpose, draught quality was taken as the primary factor in fixing the price of the bullock. As the factors like age, body weight and duration of work directly indicated the draught quality, these factors influenced bullock price fixation.

2.4 CONSTRAINTS FACED BY THE LIVESTOCK FARMERS IN MANAGEMENT OF KHILLAR CATTLE

Grover *et al.* (1997) studied the problems faced by different market functionaries during cattle transaction in Haryana. The major problems faced by the market functionaries were high registration fee, sale tax and transportation cost, lack of boarding and lodging facilities, presence of unauthorized brokers in the market, lack of security, water, feed and health care.

Ulmek and Patil (2001) studied the constraints faced by buffalo owners in breeding tract of Pandharpuri buffaloes (Kolhapur, Sangali and Solapur district). Around 17,838 farmers were interviewed through informal survey method, out of which 11,239 farmers (63.00%) responded to the questions. The study revealed that amongst the different groups of constraints, intensity of financial constraints was very high, followed by shortage of resources, technical problem and lower prices offered for per kg of milk produced.

Kumar and Suhag (2003) identified the problems faced by buyers and sellers in animal marketing as lack of drinking water for animal and men, lack of shelter, space for

animals and veterinary facilities. In case of cattle fairs, lack of proper market infrastructure and financial limitations of holding fair, lack of publicity regarding the fairs and operation of unlicensed brokers in the fair were recorded to be the major limitations.

Rajarajan and Dhaka (2003) employed Garrett's ranking to rank constraints faced by buyers and sellers in marketing of milch cattle. Study revealed that sellers ranked the non-remunerative prices for their animals as the major problem. Absence of regulated markets, exploitation by middlemen, high market charges and lack of adequate market information were ranked as second, third, fourth and fifth constraints, respectively. Among the various problems faced by buyers, the problem of malpractices adopted by sellers and traders were considered as most disturbing one. Higher market charges, lack of amenities for animals and human and lack of hygiene and sanitation were ranked in descending order.

Kumar and Meganathan (2005) examined the constraints in mutton production and marketing. Sheep farmers ranked non-availability of required fodder as the major constraint followed by poor credit facility and remunerative price. Various sheep marketing functionaries ranked remunerative price, poor credit facility and wide price fluctuations as major hindrances in marketing of sheep.

Singh *et al.* (2006) studied the sheep and goat owner's constraints in Himachal Pradesh. The main constraints reported were fewer prices for live animals and wool, poor transportation facilities, wild animal attack and higher morbidity and mortality rate.

Rooparani (2007) used Garrett's technique to rank the problems faced by buyers and sellers in cattle market. Sellers ranked insufficient clean drinking water as the major

problem followed by insufficient market area and transportation problem. Various buyers consistently ranked transportation problem, insufficient clean drinking water and lack of shelter as major hindrances in marketing of cattle.

Mande and Thombre (2009) studied the problems faced by dairy cattle owners by collecting data from 60 respondents from six villages of Latur district of Maharashtra. The ten major problems in order of rank, faced by the dairy farmers were found to be high prices of concentrate (85.00%), inadequate and untimely availability of loans (68.33%), low market price of milk (65.00%), lack of green fodder (61.67%), lack of scientific knowledge about rearing of dairy cattle (48.33%), defunct milk cooperative societies (43.33%), non-availability of veterinary services in the village (38.33%), high cost of veterinary service (35.00%), non-availability of government schemes for dairy cattle (31.67%) and inadequacy of labour (26.67%).

Thombre *et al*. (2010) studied the problems faced by Deoni cattle farmers in six villages of Latur districts of Maharashtra and found that the six major problems faced by them in order of rank were high prices of feed and fodder (68.33%), low sale price of milk (60.00%), need for more feed (48.33%), costly veterinary services (43.33%), high labour wages (38.33%) and poor economic conditions (31.67%) which did not permit them to maintain the cattle. Lack of labour (61.67%) and non-availability of government schemes for rearing Deoni cattle (51.67%) were also some of the general constraints in rearing Deoni cattle.

Ainlawar *et al*. (2012) studied the constraints faced by the Red Kandhari cattle rearers and reported that majority of cattle rearers opined, shortage of grazing land

throughout the year and also in rainy season (100.00 %) as the major constraint followed by shortage of fodder to cattle (99.17%), getting loan in time (97.50%) and getting veterinary services (58.33%). Most of the cattle rearers (70.00 %) reported that the butchers and middlemen create the chain and hence cattle rearers get low price for their cattle. Out of all the rearers, majority of the cattle rearers had the constraint of transportation of cattle and selling them in big markets in big cities (52.50%).

Kawuyol *et al*. (2012) in their study on draft animal power utilization in tillage operations in Borno State, Nigeria, reported that the main constraints in utilization of draught animal power as lack of feed resources, lack of village level repair services and spare parts, availability of advanced implements and inadequate training of animals.

Vivek (2014) conducted a study on the critical appraisal of management practices of Deoni cattle in Bidar district and reported, cheating in livestock markets (MS 49.50), high labour costs (MS 39.50) and high cost of treatment (MS 39.50) as the major constraints in Deoni cattle marketing.

Akila *et al.* (2016) conducted study on relevance of draught cattle power and its future prospects in India and concluded that the constraints in rearing draught bullocks were resources related like mechanization, topographic variation, problem in soil, imbalanced land use, changing floristic composition and the management related constraints like the lack of improved harnesses and implements, improper and inadequate health care and mishandling of animals and other constraints were poor economic status, lack of grazing facility, poor access to veterinary services and local traditional remedies.

Wagh *et al.* (2017) studied the present scenario of draught animal power utilization in Aurangabad district and concluded that maintenance of bullock pair with wages of hired labour in rainfed area was the main constraint followed by increasing price of bullock pair and insufficient work throughout the year.

Materials and Methods

III. MATERIALS AND METHOD

This chapter presents the methodology followed in conducting the research study. The contents of this chapter are presented under the following sub-heading

3.1 Research design

3.2 Sampling procedure

3.3 Variables and their empirical measurement

3.4 Instruments and methods used for data collection

3.5 Statistical tools employed for the study

3.1 RESEARCH DESIGN

Considering the objectives and variables of the study, exploratory research design was developed. Exploratory research is a methodology approach that investigates research questions that have not previously been studied in depth.

Exploratory research is often qualitative in nature. However, a study with a large sample conducted in an exploratory manner can be quantitative as well. It is also often referred to as interpretive research or a grounded theory approach due to its flexible and open-ended nature.

3.2 SAMPLING PROCEDURE

A combination of purposive and random sampling was adopted in the study to select the respondents.

3.2.1 Locale of the study

The present study was carried out purposively in the state of Karnataka. As per National Bureau of Animal Genetics Resources, there are six indigenous cattle breeds in the state, namely; Amritmahal, Deoni, Hallikar, Khillar, Krishna Valley and Malnad Gidda. For the present study Khillar indigenous cattle breed, was selected purposively based on the presence of highest number of Khillar cattle population in its home/breeding tract (GOI-Breed survey 2013)

3.2.1.1 Selection of the district

In the present study, four districts were selected purposively possessing highest Khillar breed population in the state of Karnataka i.e Belagavi, Kalaburagi, Vijayapur and Haveri as presented in table 1. From each district, 60 farmers possessing Khillar breed of cattle were randomly selected, arriving at the final sample of 240 farmers with 80 small, 80 medium and 80 large farmers from four districts. Farmers were interviewed with the help of structured interview schedule keeping in view the objectives of the study.

3.2.1.2 Selection of taluks

. In the present study, two taluks from each district, i.e, Vijayapur taluk and Indi taluk from Vijayapur district, Athani taluk and Raibagh taluk from Belagavi district, Jevargi taluk and Afazalpur taluk from Kalaburagi district, Haveri taluk and Byadagi taluk from Haveri district were selected based on highest Khilar cattle density as mentioned in table 1.

Table 1: Selection of Districts, taluks, villages and respondents

Sl. No.	District	Taluk	Village	Number of respondents			Total
				Small farmer	Medium farmer	Large farmer	
1.	Vijayapur	Indi	Nimbal	5	5	5	15
			Horti	5	5	5	15
		Vijayapur	Babaleshwar	5	5	5	15
			Kakhandaki	5	5	5	15
2.	Belagavi	Raibagh	Nilaji	5	5	5	15
			Suttatti	5	5	5	15
		Athani	Aigali	5	5	5	15
			Telasang	5	5	5	15
3.	Kalaburagi	Jevargi	Mandeval	5	5	5	15
			Jeeratagi	5	5	5	15
		Afzalpur	Manur	5	5	5	15
			Karajagi	5	5	5	15
4.	Haveri	Haveri	Naganur	5	5	5	15
			Devagiri	5	5	5	15
		Byadagi	Ghalapuji	5	5	5	15
			Agasanahalli	5	5	5	15
Total				**80**	**80**	**80**	**240**

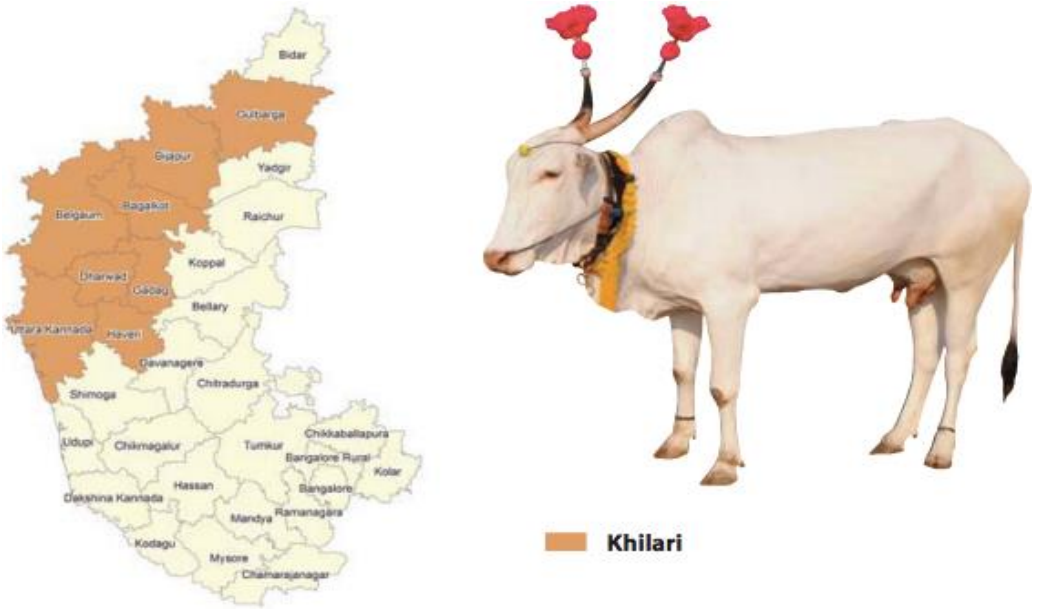

Figure 1: Khillar cattle and its distribution in different districts of Karnataka state

3.2.1.3 Selection of villages

Two villages from each taluk were selected randomly which were having highest density of Khillar cattle population. Thus the total of 16 villages were selected from 8 taluks a mentioned in table 1.

3.2.1.4 Selection of respondents

Respondents were selected based on Khillar cattle possession (Scale developed by singh, 1998) and they were categorized as below

Category	Number of Khillar cattle
Small farmer	1-3
Medium farmer	4-6
Large farmer	7-9

From each selected village, five small farmers, five medium farmers and five large farmers were selected for the study comprising a total of 15 respondents. Thus, 15 Khillar cattle owners from each village panchayat, making a totalof 240 Khillar cattle owners from 16 villages comprising 80 small farmers, 80 medium farmers and 80 large farmers were considered for the study.

3.3 OPERATIONALISATION AND MEASUREMENT OF VARIABLES

The relevant variables for the present study were selected on the basis of review of literature, discussion with experts and also based on the observation made by the researcher. Keeping in view, the objectives of the study and the variables to be measured, an interview schedule was developed. Operational concept of each of the variables along with their measurement technique followed in this investigation is presented in Table 2

Table 2: Variables and empirical measurements adopted for the study

Sl. No.	Variable	Empirical measurements
I	**Personal, social ,economic and psychological characteristics of dairy farmers**	
1.	Age	Procedure followed by Hinge (2009) with modifications
2.	Gender	Structured schedule was developed
3.	Education	Procedure followed by Kikon (2010)
4.	Social class	The classification used by Venkataramaiah (1990) were adopted with modification
5.	Family size	Scale developed and revised by Venkataramaiah (1990) was adopted with slight modifications
6.	Family type	Structured schedule was developed
7.	Occupation	Structured schedule was developed
8.	Experience in Khillar cattle rearing	Structured schedule was developed
9.	Sources of Information about Management Practices of Khillar Cattle	Structured schedule was developed
10.	Annual income	Structured schedule was developed
11.	Land holding	Procedure developed by Subashchandra (2002) with suitable modifications
12.	Sources of farm power	Structured schedule was developed
13.	Decision making ability	Structured schedule was developed
14.	Risk orientation	Scale by Supe (1969)with modification
II	**Utilization pattern of Khillar cattle among different categories of farmers**	Structured schedule was developed
III	**Marketing pattern of Khillar Breed**	Structured schedule was developed
IV	**Constraints faced by livestock farmers in management of Khillar cattle of Karnataka**	Scale developed by Garrett (1979) was adopted with modifications

3.3.1 Personal, socio economic and psychological characteristics of Khillar farmers

3.3.1.1 Age

It referred to the actual chronological age of the respondents in terms of completed years, at the time of investigation. The age of respondents was recorded as mentioned by them. The scale developed by Hinge (2009) was adopted for the study. The respondents were categorized into three categories namely, young, middle and old age groups an presented in table 3.

Table 3: Age of the respondents

Sl. No.	Category	Age (years)
1.	Young Age	Up to 30 years
2.	Middle Age	31 to 50 years
3.	Old Age	Above 50 years

3.3.1.2 Gender

Gender status was operationally defined as the sex of the respondent and classified accordingly and expressed in terms of frequencies and percentages accordingly.

3.3.1.3 Education

It was operationally defined as the number of years of formal schooling as completed by the respondent. The classification developed by Kikon (2010) was adopted for the study. Data were expressed in terms of frequencies and percentages.

Table 4: Education of the respondents

Sl. No.	Category
1.	Illiterate
2.	Primary School (1^{st} to 4^{th})
3.	Middle School (5^{th} to 7^{th})
4.	High School (8^{th} to 10^{th})
5.	PUC (11^{th} to 12^{th})
6.	Graduation (degree) and above

3.3.1.4 Social class

It was operationally defined as the position or rank of a person or group within society. The classification used by Venkataramaiah (1990) were adopted with modification. The respondents were distributed according to their caste as scheduled caste; scheduled tribes, other backward classes and general category, then social status were represented in terms of frequencies and percentage

3.3.1.5 Family size

It was operationally defined as the total number of members in the family consisting of husband, wife, children and other dependent members living under one roof. The scale developed and revised by Venkataramaiah (1990) was adopted with slight modifications. The respondents were categorized based on total number of family members as mentioned in table 5.

Table 5: Family size of the respondents

Sl. No.	Category	Number of family members
1.	Small	< 3
2.	Medium	4-6
3.	Large	7-9

3.3.1.6 Family type

Family type was studied as nuclear and joint family and the respondents were categorized accordingly and expressed in numbers and percentages. Nuclear family represented a family with single couple and unmarried children, whereas joint family represented a family with more than one couple and or married children living together.

3.3.1.7 Occupation

Occupation referred to primary family occupation or the main activity for the family livelihood. The respondents were asked to indicate their main occupation of the family and the data were expressed in frequency and percentage. The categories were agriculture + Animal husbandry and agriculture + Animal husbandry + business**.**

3.3.1.8 Experience in Khillar cattle rearing

It referred to the total number of years the respondents were involved in Khillar cattle rearing at the time of interview. It was measured by directly asking the respondents and a unit score was given to each year. Keeping mean and range as a ‘Check’, the respondents were grouped into three categories as low, medium and high experience.

3.3.1.9 Extension contact

It was defined as the degree to which the respondents maintained contact with the informal and formal organizations to get information on Khillar cattle management. The instrument consisted of 11 items (ANNEXURE). The responses were rated on three pattern continuum i.e frequently sometimes and never with respective score 3,2,1. The scores were obtained by adding the weights on the above items. The total score for each respondent was calculated by adding the scores. Based on equal intervals between maximum and minimum scores the farmers were grouped into low, medium and high categories.

3.3.1.10 Annual income

It was operationalized as the total income earned by the respondents from dairying, agriculture and other sources in one year at the time of investigation and was expressed in terms of rupees. The respondents were categorized into low, medium and high income categories on the basis of equal intervals between maximum and minimum income as presented in table 6.

Table 6: Annual income of the respondents

Sl. No.	Category	Score range
1.	Low income	Rs 40,000 – 1,60,000
2.	Medium income	Rs 1,60,000 – 2,80,000
3.	High Income	Rs 2,80, 000 – 4,00,000

3.3.1.11 Land holding

It referred to the actual area of land in hectares under cultivation with the respondent at the time of investigation. In the present study, it was expressed in hectare and farmers were categorized as mentioned in table 7.

Table 7: Land holding of the respondents

Sl. No.	Category	Land holding
1.	Landless	No land
2.	Marginal farmers	< 1 hectare
3.	Small farmer	1-2 hectare
4.	Medium farmer	2-3 hectare
5.	Large farmer	> 4 hectare

3.3.1.12 Source of farm power

It was operationally defined as dependency of farm power required for the agricultural operation. The farm source can be classified into Khillar bullocks, Khillar bullocks+ tractors and others. The scores were given and the frequencies were calculated for the categories as mentioned in the table 8.

Table 8: Sources of farm power

Category	Score
Khillar bullocks	3
Khillar bullocks + Tractors	2
Others	1

3.3.1.13 Decision making ability

It is operationally defined as the ability of the respondents to select the most efficient means among the available alternatives on the basis of scientific criteria for achieving maximum economic profit. The instrument used eight decision making ability criteria (ANNEXURE). The response categories for each item were 'not considered', 'decision taken independently' and 'considered after consultation with others'. The alternative was scored with '1', '2' and '3' scores, respectively. Thus, the possible score for each respondent on his/her decision making ability was 8 to 24. The total obtained scores of the respondents were calculated and categorized into low, medium and high groups.

3.3.1.14 Risk orientation

It was the degree to which the respondent was ready to take risk during uncertain situation and has the ability to face the problems in running the farm. Scale developed by Supe (1969) after suitable modification was used to measure the risk orientation of the respondent. The scale consists of eight items (ANNEXURE). The items were rated in three-point response categories ranging from Agree, Undecided, Disagree. There were four positive items and four negative items in the scale. The score given for positive items were; Agree - 3, Undecided - 2, and Disagree - 1. Reverse order of scoring was followed for negative items. The total score range was 8 to 24. Respondents were then categorized according to their degree of risk orientation as low, medium and high risk orientation based on frequency and percentage.

3.3.2 Utilization pattern of Khillar cattle among different categories of farmers

The utilization pattern of Khillar cattle was categorized into own use, hiring out and others as presented in table 9. The data was assessed through interview schedule. The responses were collected and classified category wise and expressed in terms of frequency and percentage.

Table 9: Utilization pattern of Khillar cattle among different categories of farmers

Category	Use
Own use	Milking
	Agriculture activities
	Manure
	Carting
	Breeding purpose
	Prestige/Show purpose
Hiring out	Agriculture activities
	Transportation
Others	Edible oil extraction
	Electricity generation

3.3.3 Marketing pattern of Khillar breed

Interview schedule was developed in consultation with the expert's suggestion. The data was collected from the farmers of different category regarding the cattle marketing pattern. The data collected on various marketing practices were statistically analyzed for frequency and percentage.

3.3.3.1 Procurement of Khillar breed by the farmers

Procurement of Khillar breed by the farmers referred to purchasing the Khillar animals from different sources. The respondents were asked to indicate the source of purchasing the Khillar cattle and data were expressed in frequency and percentage. The categories are as mentioned in table 10.

Table 10: Procurement of Khillar breed by the farmers

Category	Source
Khillar breed procurement	From market
	From neighbour
	From middleman
	Other sources

3.3.3.2 Market structure of the village where the Khillar cattle were exchanged

Market structure is categorized into shandy, cattle fair and others. The respondents were asked to indicate the structure of Khillar cattle market of their village and data were expressed in frequency and percentage.

3.3.3.3 Selection of good Khillar cattle

Farmers select the Khillar cattle based on certain criteria. Through review of literature and expert suggestions, three criteria were listed in interview schedule i.e breed characteristics, hair whorls and both. The farmers were asked about the Khillar cattle selection criteria and the data were expressed in frequency and percentage.

3.3.3.4 Livestock marketing pattern in cattle fair/market

Livestock marketing patterns in cattle fair/market were categorize as presented in table 11. The farmers were asked about the Khillar cattle marketing pattern and the data were expressed in frequency and percentage.

Table 11: Livestock marketing pattern in cattle fair/market

Category	Marketing Pattern
Livestock marketing pattern in cattle fair/market	Open auction
	Negotiation
	Under cover mechanism
	Others

3.3.3.5 Economic value of Khillar breed

Through review of literature and expert suggestions 10 factors (ANNEXURE) were listed in interview schedule for milch animals and six factors (ANNEXURE) listed for draft animals. Farmers were asked to rank the factors and results were ranked through Garrett score

3.3.3.6 Constraints in Khillar cattle marketing

Constraints in cattle marketing referred to problems faced by farmers in Khillar cattle marketing. Through review of literature and expert suggestions 15 constraints (ANNEXURE) were listed in interview schedule and the farmers were asked to rank the problems. Constraints were analysed and ranked according to Garrett score

3.3.4 Constraints faced by the livestock farmers in management of Khillar cattle

Constraints in cattle management referred to problems faced by farmers in Khillar cattle rearing. Constraints in Khillar cattle management were collected through interview schedule developed through review of literature and expert suggestions. A total 18 constraints (ANNEXURE) were listed in interview schedule and were asked to rank the problems. Constraints were analysed and ranked according to Garrett score.

3.4 INSTRUMENTS AND METHODS USED FOR DATA COLLECTION

Taking into consideration the scope and objectives of the study a structured interview schedule (ANNEXURE) was prepared. All the livestock farmers were personally interviewed in the local language i.e. Kannada. The statements as specified in the schedule were asked systematically. Sufficient probing and clarification were made to make clear understanding of the respondents about the questions for getting appropriate response. Further, the reactions and suggestions of the respondents beyond the study area were also noted and used during interpretation of the data. The information thus collected was tabulated for empirical measurement analysis.

3.5 DATA PROCESSING AND ANALYSIS USING STATISTICAL METHODS

The primary and secondary data that was obtained was subjected to following statistical techniques. Statistical techniques employed were listed below.

1. Descriptive statistics
2. Garrett’s ranking technique

3.5.1 Descriptive statistics

The descriptive statistics such as frequency and percentage was calculated as per Snedecor and Cochran (1989)

The data were subjected to frequency and percentage which were used to know the distribution of respondents according to selected variables and subsequently results were tabulated.

3.5.2 Garrett's ranking technique

The factors determining the economic value of Khillar breed, problems in Khillar cattle marketing and constraints faced by the livestock farmers in management of Khillar cattle were identified using Garrett's ranking technique (Garrett, 1979). According to this technique the respondents were asked to rank the list of ten problems. The order of merit thus, given by the respondents was converted into ranks by using the following formula;

$$\text{Per cent position} = \mathbf{100*(R_{ij}-0.50)/N_j}$$

Where, R_{ij}=Rank given for the i^{th} problem by j^{th} individual

N_j=Number of constraints/problems ranked by j^{th} individual.

The per cent positions thus, obtained were converted into scores by referring the table given by Garrett. Then for each problem the scores of individual respondents were added and divided by the number of respondents. The main score for all the problems were arranged and thus, ranks were assigned to the problems.

Figure 2: Collection of data from the respondents

Figure 3: Horti village cattle fair

Results

VI. RESULTS

In consistence with the objectives set forth for the study, the data were collected, tabulated and analyzed. The results so obtained are presented under the following sub headings;

4.1 Personal, socio-economic and psychological characteristics of livestock farmers owning Khillar cattle of Karnataka

4.2 Utilization pattern of Khillar cattle among different categories of farmers

4.3 Marketing pattern of Khillar cattle of Karnataka

4.4 Constraints faced by the livestock farmers in management of Khillar cattle of Karnataka

4.1 PERSONAL, SOCIO ECONOMIC AND PSYCHOLOGICAL CHARACTERISTICS OF LIVESTOCK FARMERS OWNING KHILLAR CATTLE OF KARNATAKA

4.1.1 Age

It was evident from the Table 12 that among the small farmers, majority belonged to middle age (38.75%) followed by young (35.00%) and old age group (26.25%). Similarly, among the medium farmers, significant per cent belonged to middle age (42.50%) followed by young (30.00%) and old age group (27.50%) and in case of large farmers, most of them belonged to middle age (48.75%) followed by old (28.75%) and young (22.50%) age groups.

Among the overall respondents, large number of the respondents were middle aged (43.34%) followed by young (29.16%) and old aged (27.50%).

4.1.2 Gender

It was observed from Table 12 that, majority of the respondents among all the small (87.50%), medium (97.50%) and large (90%) farmers were men, forming 91.66 per cent of the total respondents of the study area and the rest being women (8.34%).

4.1.3 Education

The data in Table 12 indicated that 36.25 per cent of the small farmers secured middle school education, whereas 25.00 per cent had primary, 13.75 per cent had high school education followed by PUC education (12.5%), graduation (11.25%) and illiterates (1.25%). Among the medium farmers, about 37.50 per cent had middle school education followed by primary school (25.00%), high school education (22.50%), PUC education (6.25%), graduation (6.25%) and illiterate (2.50%) and in case of large farmers, 30.00 per cent had high school education followed by equal percentage (22.50%) had primary and PUC education, followed by middle school (15.00%) graduation (6.25%) and illiterates (3.75%).

Among the total respondents, 29.58 per cent had middle school followed by primary school (24.16%), high school (22.08%), PUC education (13,75%), graduation (7.93%) and illiterates (2.50%).

4.1.4 Caste

It was observed from the Table 12 that 61.25 per cent of the small farmers belonged to OBC category followed by equal per cent (18.75%) belonged to General category and SC category whereas 1.25 per cent belonged to ST category. Among the medium farmers, large number of the respondents belonged to OBC category (76.25%) followed by General (15.00%), SC (6.25%) and ST category (2.50%). In case of large farmers, significant per cent of the farmers belonged to OBC category (82.50%) followed by General (12.50%), SC (3.75%) and ST category (1.25%).

Among the overall caste of the respondents, 73.33 per cent belonged to OBC category followed by General (15.83%), SC (9.16%) and ST category (1.68%)

4.1.5 Family size

Results (Table 12) indicated that, majority of the small farmers had medium family size (62.50%) followed by small (30.00%) and large family size (7.50%). Similarly, majority of the medium farmers had medium family size (67.50%) followed by small (26.25%) and large family size (6.25%). Among the large farmers, large number of respondents had medium family size (57.50%) followed by small (32.50%) and large (10.00%).

Among the overall respondents, majority had medium family size (62.50%) followed by small (29.58%) and large family size (7.92%).

Table 12: Personal and social characteristics of Khillar farmers

Sl. No.	Category	Small (N=80)		Medium (N=80)		Large (N=80)		Total (N=240)	
		F	%	F	%	F	%	F	%
1.	**Age**								
	Young age (up to 30 years)	28	35.00	24	30.00	18	22.50	70	29.16
	Middle age (31 to 50 years)	31	38.75	34	42.50	39	48.75	104	43.34
	Old age (above 50 years)	21	26.25	22	27.50	23	28.75	66	27.50
2.	**Gender**								
	Men	70	87.50	78	97.50	72	90.00	220	91.66
	Women	10	12.50	2	2.50	8	10.00	20	8.34
3.	**Education**								
	Illiterate	1	1.25	2	2.50	3	3.75	6	2.50
	Primary school	20	25.00	20	25.00	18	22.50	58	24.16
	Middle school	29	36.25	30	37.50	12	15.00	71	29.58
	High school	11	13.75	18	22.50	24	30.00	53	22.08
	PUC	10	12.5	5	6.25	18	22.50	33	13.75
	Graduation (degree & above)	9	11.25	5	6.25	5	6.25	19	7.93
4.	**Caste**								
	General	15	18.75	12	15.00	10	12.50	38	15.83
	SC	15	18.75	5	6.25	3	3.75	22	9.16
	ST	1	1.25	2	2.50	1	1.25	4	1.68
	OBC	49	61.25	61	76.25	66	82.50	176	73.33
5.	**Family size**								
	Small (<3)	24	30	21	26.25	26	32.50	71	29.58
	Medium (4 – 6)	50	62.50	54	67.50	46	57.50	150	62.50
	Large (7 – 9)	6	7.50	5	6.25	8	10.00	19	7.92
6.	**Family type**								
	Joint	4	5.00	8	10.00	7	8.75	19	7.92
	Nuclear	76	95.00	72	90.00	73	91.25	221	92.08
7.	**Occupation**								
	Agriculture +Animal husbandry	70	87.50	66	82.50	53	66.25	189	78.75
	Agriculture +animal husbandry+ Business	10	12.50	14	17.50	27	33.75	51	21.25
8.	**Experience in Khillar cattle rearing**								
	Low (≤10)	15	18.75	10	12.50	12	15.00	37	15.42
	Medium (11 - 22)	34	42.50	46	57.50	48	60.00	128	53.33
	High (≥22)	31	38.75	24	30.00	20	25.00	75	31.25
9.	**Extension contact**								
	Low (11-17)	15	18.75	11	13.75	9	11.25	35	14.58
	Medium (18 - 25)	42	52.50	47	58.75	46	57.50	135	56.26
	High (26-33)	23	28.75	22	27.50	25	31.25	70	29.16

4.1.6 Family Type

It was observed from Table 12 that majority of the small (95.00%), medium (90.00%) and large farmers (91.25%) lived in nuclear family and small percentage of the small (5.00%) medium (10.00%), large (8.75%) farmers lived in joint family.

Among the total respondents, majority lived in nuclear family (92.08%) and only 7.92 per cent lived in joint family system.

4.1.7 Occupation

From Table 12, it was observed that Animal husbandry along with agriculture (87.50%) was found to be the main occupation among small farmers followed by animal husbandry and agriculture along with business (12.50%). Similarly, significant per cent of the medium farmers had animal husbandry with agriculture as their main occupation (82.50%) followed by other occupation like agriculture and animal husbandry along with business (17.50%). In case of large farmers, majority of the respondents had animal husbandry with agriculture as their major occupation (66.25%) followed by animal husbandry, agriculture with business (33.75%).

Among the overall respondents, animal husbandry with agriculture was found to be their main occupation (78.75%) followed by animal husbandry and agriculture with business (21.25%).

4.1.8 Experience in Khillar cattle rearing

Table 12 revealed that majority of the respondents among small (42.50%), medium (57.50%) and large farmers (60.00%) had medium experience in rearing Khillar cattle

followed by high (38.75%, 30.00% and 25.00%, respectively) and low experience (18.75%, 12.50% and 15.00%, respectively).

Among the overall respondents, majority had medium experience in rearing Khillar cattle (53.33%) followed by high (31.25%) and low (15.42%).

4.1.9 Extension contact

Table 12 revealed that majority of the respondents among small (52.50%), medium (58.75%) and large (57.50%) farmers had medium level of extension contact followed by high extension contact (28.75%, 27.50% and 31.25%, respectively) and low level extension contact (18.75%, 13.75% and 11.25%, respectively).

Among the overall respondents, majority had medium level of extension contact (56.26%) followed by high (29.16%) and low (14.58%).

4.1.10 Annual income

It could be observed from Table 13 that, majority of the small farmers had low annual income (73.75%) followed by medium (26.25%) and none of the farmers had high annual income, whereas, majority of the medium farmers had low annual income (71.25%) followed by high (15.00%) and medium (13.75%) and more number of large farmers had medium annual income (37.50%) followed by high (25.00%) and low (25.00%).

Majority among the overall farmers had low annual income (56.66%) followed by medium (30.00%) and high income (13.34%).

4.1.11 Land holding

It was evident from the Table 13 that more percentage of the small farmers were small land holders (37.50%) followed by marginal (26.25%), landless (22.50%), medium (7.50%) and large land holders (6.25%). In case of medium farmers, more percentage of respondents were medium land holders (46.25%) followed by small (23.75%), large (12.50%), marginal (10.00%) and landless (7.50%). Among the large farmers, majority had large land holding (41.25%) followed by medium (31.25%), small (20.00%), marginal (7.50%) and none of the farmers were landless.

Table 13: Economic characteristics of Khillar cattle farmers

Sl. No.	Category	Small (N=80)		Medium (N=80)		Large (N=80)		Total N=240	
		F	%	F	%s	F	%	F	%
1.	**Annual Income**								
	Low (Rs 40,000-1,60,000)	59	73.75	57	71.25	20	25.00	136	56.66
	Medium (Rs 1,60,001–2,80,000)	21	26.25	11	13.75	30	37.50	72	30.00
	High (Rs 2,80,001–4,00,000)	0	0	12	15.00	20	25.00	32	13.34
2.	**Land holding**								
	Landless	18	22.50	6	7.50	0	00	24	10.00
	Marginal (<1 hectare)	21	26.25	8	10.00	6	7.50	35	14.58
	Small (1 to 2 hectare)	30	37.50	19	23.75	16	20.00	65	27.08
	Medium (2 to 3 hectare)	6	7.500	37	46.25	25	31.25	68	28.34
	Large (>4 hectare)	5	6.25	10	12.50	33	41.25	48	20.00
3.	**Sources of farm power**								
	Khillar bullock	51	63.75	42	52.50	18	22.50	111	46.25
	Tractor + Khillar bullock	24	30.00	31	38.75	59	73.75	114	47.50
	Others (Power tiller)	5	6.25	7	8.75	3	3.75	15	6.25

Note: F = Frequency

Among all the respondents, higher percentage (28.34%) of the farmers were medium land holders followed by small (27.08%), large (20.00%), marginal land holders (14.45%) and landless farmers (12.22%).

4.1.12 Source of farm power

Table 13 indicated that 47.5 per cent of the overall farmers were availing the farm power by using Khillar bullocks and tractors followed by Khillar bullocks only (46.25 %), and other machinery like power tillers (6.25 %). It is clear from the table that the small farmers were mainly depended on Khillar bullocks (63.75%) followed by Khillar bullocks and tractors (30.00%) and other machinery like power tillers (6.25%). Among the medium farmers, majority used Khillar bullocks (52.50%) followed by usage of tractors and Khillar bullocks (38.75%) and power tiller (8.75%). In case of large farmers majority three-fourth used tractor and Khillar bullock (73.75%), followed by Khillar bullocks only (22.50%) and other sources like power tiller usage (3.75%).

4.1.13 Decision making ability

Distribution of respondents according to different components of decision making in Khillar cattle rearing is presented in table 14. It revealed that among the small farmers, 72.50 per cent had medium level of decision making ability followed by high level (17.50%) and low level (10.00%) of decision making ability. Among the medium farmers, 71.25 per cent had medium level of decision making ability followed by high level (15.00%) and low level (13.75%) of decision making ability. Among the large farmers, 53.75 per cent had medium level of decision making ability followed by high level (40.00%) and low level (6.25%) of decision making ability.

Among the overall farmers majority had medium level of decision making ability (65.84%) followed by high (24.16%) and low level of decision making ability (10.00%).

Table 14: Distribution of respondents based on psychological characters

Sl. No.	Category	Small (N=80)		Medium (N=80)		Large (N=80)		Total (N=240)	
		F	%	F	%	F	%	F	%
1.	**Decision making ability**								
	Low (8-13)	8	10.00	11	13.75	5	6.25	24	10.00
	Medium (14-19)	58	72.50	57	71.25	43	53.75	158	65.84
	High (20-24)	14	17.50	12	15.00	32	40.00	58	24.16
2.	**Risk orientation**								
	Low (8-13)	9	11.25	15	18.75	9	11.25	33	13.75
	Medium (14-19)	55	68.75	47	58.75	42	52.50	144	60.00
	High (20-24)	16	20.00	18	22.50	29	36.25	63	26.25

Note: F= Frequency

4.1.14 Risk orientation

It was observed from Table 14 that, majority of the small (68.75%), medium (58.75%) and large farmers (52.50%) were in medium risk orientation category followed by high risk orientation (20.00%, 22.50%, and 36.25%, respectively) and low level of risk orientation (11.25%, 18.75%, and 11.25%, respectively).

Among the overall respondents, majority had medium level of risk orientation (60.00%) followed by high (26.25%) and low (13.75%).

4.2 UTILIZATION PATTERN OF KHILLAR CATTLE AMONG DIFFERENT CATEGORIES OF FARMERS

4.2.1 Own Use

It could be observed from the Table 15 that utilization pattern varies among different categories of farmers. Among the small farmers who were using Khillar cattle for own use, used Khillar cattle for milking purpose (96.25%) followed by agricultural activities (63.75%), manure (56.25%), carting (40.00%) and breeding purpose (8.75%). None of the small farmer used Khillar cattle for prestige/show purpose. Among the medium farmers who were using Khillar cattle for own use, used Khillar cattle for milking purpose (88.75%) followed by agricultural activities (52.50%), manure (75.00%), carting (52.50%) and breeding purpose (10.00%). None of the medium farmers used Khillar cattle for prestige/show purpose. Majority of the large farmers used Khillar cattle for manuare purpose (97.50%) followed by milking purpose (81.25%), agricultural activities (47.50%), carting (38.75%) and equal percentage of farmers used Khillar cattle for breeding and prestigious/show purpose (3.75%).

Among the overall farmers, who were using Khillar cattle for own use, used Khillar cattle for milking purpose (88.75%), followed by manure purpose (76.25%), agricultural activities (54.58%) , carting purpose (43.75%), breeding purpose (7.50%) and for prestige/show purpose (1.25%).

4.2.2 Hiring out

It could be observed from the Table 15 that, the small farmers (83.75%), followed by medium farmers (56.25%) and large farmers (17.20%) were using their Khillar bullocks

for hiring out for agricultural activities and 23.75 per cent of small farmers followed by same per cent of medium and large farmers (15.00%) were hiring out their Khillar bullocks for transportation.

Among the overall farmers, 52.50 per cent farmers were hiring out their Khillar bullocks for agricultural activities and 17.91 per cent for the transportation.

4.2.3 Other use

None of the small, medium and large farmers were using their Khillar cattle either for edible oil extraction or for electricity generation and it was found the same with the overall respondents also.

Table 15: Distribution of respondents based on utilization pattern of Khillar breed

Sl. No.	Category	Small (N=80)		Medium (N=80)		Large (N=80)		Total (N=240)	
		F	%	F	%	F	%	F	%
1.	**Own use**								
	i. Milking	77	96.25	71	88.75	65	81.25	213	88.75
	ii. Agriculture activities	51	63.75	42	52.50	38	47.50	131	54.58
	iii. Manure	45	56.25	60	75.00	78	97.50	183	76.25
	iv. Carting	32	40.00	42	52.50	31	38.75	105	43.75
	vi. Breeding Purpose	7	8.75	8	10.00	3	3.75	18	7.50
	vii. Prestige/show purpose	_	_	_	_	3	3.75	3	1.25
2.	**Hiring out**								
	i. Agricultural activities	67	83.75	45	56.25	14	17.50	126	52.5
	ii. Transportation	19	23.75	12	15.00	12	15.00	43	17.91

Note: F= Frequency

4.3 MARKETING PATTERN OF KHILLAR BREED

4.3.1 Procurement of Khillar breed by the farmer

It could be observed from the Table 16 that, majority of the small farmers purchased Khillar cattle from neighbours (43.75%) followed by market (41.25%) and middleman (15.00%). Among the medium farmers, majority purchased Khillar Cattle from market (63.75%) followed by middleman (20.00%) and neighbours (15.00%). Majority of large farmers purchased Khillar cattle from market (57.50%) followed by neighbours (21.25%) and middleman (21.25%).

Among the overall farmers it could be observed that, majority of the farmers purchased Khillar cattle from the market (54.59%) followed by neighbours (26.66%) and from the middle man (18.75%).

4.3.2 Market structure of the village where the Khillar cattle were exchanged

It could be observed from the Table 16 that equal per cent (65.00%) of the small, medium and large farmers expressed that shandy was the marketing structure of their village and equal percentage (15.00%) of small, medium and large farmers expressed that cattle fair was the marketing structure in their village where the Khillar cattle was exchanged.

4.3.3 Selection of good Khillar cattle

Table 16 indicated that majority of the respondents among small farmers (62.50%), medium farmers (58.75%) and large farmers (55.00%) selected Khillar cattle based on both hair whorls and breed characteristics followed by 26.25 per cent of small

farmers, 21.25 per cent of medium farmers and 16.25 per cent of large farmers selected Khillar cattle based on the hair whorls alone. Less number of respondents among the small farmers (10.00%) followed by medium farmers (13.75%) and large farmers (16.25%) were selecting the Khillar animal based on the breed characteristics alone. Only small per cent of the small farmers (1.25%), medium farmers (6.25%) and large farmers (12.50%) sought advice from the Veterinary officers.

Among the overall farmers, it could be observed that, 58.75 per cent farmers selected the Khillar animal based on the breed characteristics and hair whorls followed by 21.25 per cent of the farmers selected based on hair whorls 13.33 per cent of the farmers selected based on the breed characteristics. Only 6.67 per cent of the farmers selected Khillar animal based on the advice of Veterinary officers.

4.3.4 Livestock marketing pattern in cattle fair/ market

Table 16 indicated that none of the respondents among the small, medium and large farmers opined about open auction in the cattle fair or cattle market. Majority of the respondents among small farmers (83.75%), medium farmers (88.75%) and large farmers (95.00%) opined negotiation as the main marketing pattern in the cattle fair or cattle market. Less number of respondents among small farmers (16.25%), medium farmers (11.25%) and large farmers (5.00%) opined about the undercover mechanism was the marketing pattern in the cattle fair or cattle market.

Among the overall farmers, it was observed that 89.58 per cent of the farmers opined negotiation and 10.42 per cent opined under cover mechanism as the livestock marketing pattern in cattle fair/ market

Table 16: Distribution of respondents based on marketing pattern of Khillar Breed

Sl. No.	Category	Small (N=80)		Medium (N=80)		Large (N=80)		Total (N=240)	
		F	%	F	%	F	%	F	%
1.	**Khillar Breed Procurement**								
	i. From market	33	41.25	51	63.75	46	57.50	130	54.59
	ii. From neighbour	35	43.75	12	15.00	17	21,25	64	26.66
	iii. From middleman	12	15.00	16	20.00	17	21.25	45	18.75
2.	**Market structure**								
	i. Shandy	65	81.25	65	81.25	65	81.25	195	81.25
	ii. Cattle fair	15	18.75	15	18.75	15	18.75	45	18.75
3.	**Selection of good Khillar cattle**								
	i. Breed characteristics	8	10.00	11	13.75	13	16.25	32	13.33
	ii. Hair whorls	21	26.25	17	21.25	13	16.25	51	21.25
	iii. Both	50	62.50	47	58.75	44	55.00	141	58.75
	iv. By the advice of veterinary officer	1	1.25	5	6.25	10	12.50	16	6.67
4.	**Livestock marketing pattern in cattle fair/ market**								
	i. Open auction	-	-	-	-	-	-	-	-
	ii. Negotiation	67	83.75	71	88.75	76	95.00	215	89.58
	iii. Under cover mechanism	13	16.25	9	11.25	4	5.00	26	10.42

Note: F= Frequency

4.3.5 Factors determining the economic value of Khillar breed

4.3.5.1 Khillar cow

Table 17 indicated that, the first and foremost factor determining the economic value of Khillar cow was the prize won in the competition (MS 76.22), followed by presence or absence of undesirable marks (MS 73.59), breed characters (MS 59.70) calf at

foot (MS 55.60) parity (MS 54.00) age (MS 49.00) general appearance (MS 43.30), health status (MS 40.50), temperament (MS 29.00) and milk yield (MS 18.00).

Table 17: Ranking of factors determining the economic value of Khillar cow

Sl. No.	Factors	Mean score (MS)	Rank
1.	Prize won in the competition	76.22	I
2.	Presence / absence of undesirable marks	73.59	II
3.	Breed characters	59.70	III
4.	Calf at foot	55.60	IV
5.	Parity	54.00	V
6.	Age	49.00	VI
7.	General appearance	43.30	VII
8.	Health status	40.50	VIII
9.	Temperament	29.00	IX
10.	Milk yield	18.00	X

4.3.5.2 Draft animal

Table 18 indicated that the first and foremost factor determining the economic value of Khillar bullock was the prize won in the competition (MS 72.80), followed by presence or absence of undesirable marks (MS 67.20), breed characters (MS 54.00),general appearance (MS 46.00), age (MS 32.80) and pair set (MS 27.20).

Table 18: Ranking of factors determining the economic value of Khillar draft animal

Sl. No.	Factors	Mean score	Rank
1.	Prize won in the competition	72.80	I
2.	Presence or absence of undesirable marks	67.20	II
3.	Breed characteristics	54.00	III
4.	General appearance	46.00	IV
5.	Age	32.80	V
6.	Pair set	27.20	VI

4.3.6 Problems in Khillar cattle marketing

It was observed (Table 19) that the major problem in marketing of Khillar cattle was cheating by brokers (MS 67.63), followed by transportation (MS 63.56), lack of drinking water arrangements (MS 51.02), lack of animal sheds (MS 41.10), lack of fodder (MS 38.33), absence of farmers rest house (MS 35.22), lack of hygiene (MS 34.19), uneven/ kaccha floor (MS 30.15), inadequate area for animal assembly (MS 29.10), lack of parking space (MS 27.67), lack of fencing (MS 26.19), absence of internal roads in the market area (MS 24.55), lack of loading/unloading dock (MS 23.20), lack of veterinary facilities (MS 19.19) and high market fee (MS 17.77).

Table 19: Problems in Khillar cattle marketing

Sl. No.	Factors	Mean score	Rank
1.	Cheating by brokers	67.63	I
2.	Transportation Problem	63.56	II
3.	Lack of drinking water facilities	51.02	III
4.	Lack of animal sheds	41.10	IV
5.	Lack of fodder	38.33	V
6.	Absence of farmers rest house	35.22	VI
7.	Lack of hygiene	34.19	VII
8.	Uneven/ kachha floor	30.15	VIII
9.	Inadequate area for animal assembly	29.10	IX
10.	Lack of parking space	27.67	X
11.	Lack of fencing	26.19	XI
12.	Absence of internal roads in the market area	24.55	XII
13.	Lack of loading/ unloading dock	23.20	XIII
14.	Lack of veterinary facilities	19.19	XIV
15.	High market fee	17.77	XV

4.4 CONSTRAINTS FACED BY THE LIVESTOCK FARMERS IN MANAGEMENT OF KHILLAR CATTLE OF KARNATAKA

4.4.1 Economic Constraints

It was observed from the Table 20 that, the first and foremost economic constraint faced by livestock farmers in management of Khillar cattle was, lack of credit facility from Government/ Banks (MS 56.01) and the second constraint was lack of subsidized insurance policy from Government (MS 46.81). High cost of animal (MS 43.92) was ranked as third constraint. The fourth constraint was high cost of implements and spares (MS 41.10) and high cost of feed (MS 40.36) was ranked as fifth. The sixth constraint was low price of milk (MS 38.63) whereas difficulty in finding market for sale (MS 31.88) was seventh constraint. The eighth constraint was reduction in demand of Khillar animal (MS 22.66) and finally the high cost of treatment (MS 18.15) was ranked as the ninth constraint.

Table 20: Economic constraints faced by livestock farmers

Sl. No.	Factors	Mean score	Rank
1.	Lack of credit facility from Government/ Banks	56.01	I
2.	Lack of subsidized insurance policy from Government	46.81	II
3.	High cost of animal	43.92	III
4.	High cost of implements and spares	41.10	IV
5.	High cost of feed	40.36	V
6.	Low price of milk	38.63	VI
7.	Difficulty in finding market for sale	31.88	VII
8.	Reduction in demand of Khillar animal	22.66	VIII
9.	High cost of treatment	18.15	IX

4.4.2 Managerial constraints

On perusal of Table 21 revealed that, the first and foremost factor determining the managerial constraints was lack of labour (MS 68.55) followed by seasonality of agricultural work (MS 64.43), low productivity of cows (MS 62.07), less utility because of mechanization (MS 51.47), changes from traditional farm practices (MS 47.65), lack of modern scientific implements (MS 45.30), poor management (MS 36.51), lack of trained extension staff (MS 26.12) and non-availability of veterinary and AI services (MS 21.53).

Table 21: Managerial constraints faced by Khillar cattle farmers

Sl. No.	Factors	Mean score	Rank
1.	Lack of labour	68.55	I
2.	Seasonality of agricultural work	64.43	II
3.	Low productivity of cows	62.07	III
4.	Less utility because of mechanization	51.47	IV
5.	Changes from traditional farm practices	47.65	V
6.	Lack of modern scientific implements	45.30	VI
7.	Poor management	36.51	VII
8.	Lack of trained extension staff	26.12	VIII
9.	Non availability of veterinary and AI services	21.53	IX

Discussion

V. DISCUSSION

The results presented in the previous chapter were compared with reported findings of other research investigations, discussed and conclusions were drawn. The discussion is presented under the following heads.

5.1 Personal, socio economic and psychological characteristics of livestock farmers owning Khillar cattle of Karnataka

5.2 The utilization pattern of Khillar cattle among different categories of farmers

5.3 Marketing pattern of Khillar cattle of Karnataka.

5.4 Constraints faced by the livestock farmers in management of Khillar cattle of Karnataka.

5.1 PERSONAL SOCIO ECONOMIC AND PSYCHOLOGICAL CHARACTERISTICS OF LIVESTOCK FARMERS OWNING KHILLAR CATTLE OF KARNATAKA

5.1.1 Age

In the present study of the overall respondents, large number of the respondents were middle aged (43.34%) followed by young (29.16%) and old aged (27.50%).

This indicated that majority of the Khillar animal owners were middle aged and it might be due to the labour and skill involved in the utilization of draught bullocks. Further, it also might be due to involvement of younger generation into farming realizing its cultural value and its importance in livelihood security. The results are in confirmation with the findings of Akila (2009), Vivek (2014) and Kuralkar et al. (2015).

5.1.2 Gender

In the present study, majority of the respondents among all the small (87.50%), medium (97.50%) and large (90.00%) farmers were men, resulting in 91.66 per cent of the total respondents of the study area and the rest being women (8.34%). This could be due to the fact that, men were more involved in livestock farming, more easily handle native breeds and were more likely to work for their family income and women looked after the household works. Similar findings were also reported by Kuralkar *et al.* (2015) in their study area.

5.1.3 Education

In the present study, most of the respondents had middle school education among both small (36.25 %) and medium (37.50%) farmers whereas more number (30.00%) of the large farmers had high school education. These findings are in contrary with the reports of Verma (2013), Thombre *et al*. (2010) and Vivek (2014) indicating that, majority of the respondents had primary education. This might be due to the fact that the literacy rates of Karnataka are better in the present days and hence, the literacy rates are higher in the study area. However, Kauthale *et al*. (2019) revealed that majority of the farmers were literate in their study area.

5.1.4 Caste

In the present study, among the overall respondents, 73.33 per cent belonged to OBC category followed by General category (15.83%), SC category (9.16%) and ST category (1.68%). Khillar cattle rearing is a traditional occupation in a particular tract might be the reason for all the community rearing the breed.

Similar findings were also observed by Verma (2013) and Vivek (2014) in their study area. In a similar study, Kuralkar *et al*. (2015) reported that most of the cattle owners belonged to OBC categoty followed by sheduled tribes.

5.1.5 Family size

In the present study, among the overall respondents, majority (62.50%) had medium family size followed by small (29.58%) and large family size (7.92%).

Since the joint families are getting fragmented into smaller units and also because of the advantages of small family, the above trend was observed. Similar observations were reported by Vivek (2014) and Kauthale *et al*. (2019)

5.1.6 Family Type

In the present study, among all the respondents, majority (92.08%) were living in nuclear family and only 7.92 per cent were living in joint family as per the current trend in the social system, still indicating the continuity of rearing the Khillar cattle and importance of the Khillar breed in the agricultural operations of the families.

The findings are in accordance with the reports of Thombre *et al.* (2010) and Vivek (2014). The present findings were not in agreement with Akila (2009), where the majority of the draught animal farmers were living in joint family.

5.1.7 Occupation

In the present study, among the overall respondents, animal husbandry with agriculture (78.75%) was found to be their main occupation.

Since animal husbandry and agriculture are interdependent and integrated farming system is practiced since generations, the same findings were observed in the present study. Akila (2009), Thombre *et al.* (2010), Vivek (2014), Kuralkar *et al.* (2015) and Kauthale *et al*. (2019) also reported similar findings.

5.1.8 Experience in Khillar cattle rearing

In the present study, around one half of the respondents among small (42.50%), medium (57.50%) and large (60.00%) farmers had medium level of Khillar cattle rearing experience. The overall level of Khillar cattle rearing experience was medium (53.33%) followed by high (31.25%) and low (15.42%).

This indicated that there was medium to high experience in rearing Khillar cattle and Khillar cattle plays an important role in daily agricultural operations. Similar findings were also observed by Akila (2009) in their study area, where most of the respondents had medium number of years of experience in rearing Khillar cattle.

5.1.9 Extension contact

In the present study, among the overall respondents, majority had medium level of extension contact (56.26%) followed by high (29.16%) and low (14.58%).

Though the results of the study appeared to be fairly satisfactory with majority of the Khillar rearing farmers in medium category as most respondents had often contact with informal sources like friends, relatives, neighbours and progressive farmers but not all farmers had availed the opportunity of contacting various formal sources like veterinary/agriculture college, KVKs and Research Institutes for obtaining information on

improved management practices of their animals. It was also observed that majority of the institutions were not much involved in delivering need based and demand driven information about indigenous cattle.

5.1.10 Annual income

In the present study, majority among the overall farmers had low annual income (56.66%) followed by medium (30.00%) and high (13.34%). This might be due to the fact that majority of the farmers had small acres of rain fed land holding due to which the annual income was very low. Further, seasonality of agricultural work and low agricultural production also added to their low annual income category. These results are in contrary with the reports of Thombre *et al.* (2010) and Vivek (2014) where the majority of the farmers had medium annual income.

5.1.11 Land holding

In the present study, among the all respondents, higher percentage (28.34%) of the farmers were medium land holders followed by small (27.08%), large land holders (20.00%), marginal (14.45%) and landless farmers (12.22%).

The land holding size is on decreasing trend due might be due to fragmentation of land holding along the generations in rural India. Similar findings were reported by Vivek (2014), Kuralkar *et al.* (2015) and Kauthale *et al*. (2019). However, the present findings are in contrary with the study findings of Verma *et al.* (2014) in which majority of the respondents belonged to marginal category of land holdings.

5.1.12 Sources of farm power

In the present study, 47.5 per cent of the overall farmers used Khillar bullocks and tractors as source of farm power followed by Khillar bullocks only (46.25 %), and other machinery like power tiller (6.25%). These findings were in line with the Akila (2009) and Kuralkar *et al.* (2015) who reported that that some agricultural operations still depend on draught power bullocks despite having great farm mechanization.

5.1.13 Decision making ability

Among the overall farmers, majority had medium level of decision making ability (65.84%) followed by high level (24.16%) and low level of decision making ability (10.00%).

As agriculture or livestock farming involves investment, risk and demands time, the respondents discussed with other family members about farming activities or rearing of cattle. This clearly indicated that the respondents took the farming related decisions in consultation with their family members placing them in the medium level of decision making ability.

5.1.14 Risk orientation

Among the overall respondents, majority had medium (60.00%) level of risk orientation followed by high (26.25%) and low (13.75%).

As majority of the respondents had medium decision making ability and low family income, they were wary of taking any risk in farming activities. However, very few farmers

were ready to take risk in cattle rearing and hence, the farming related decisions were taken in consultation with their family members.

5.2 UTILIZATION PATTERN OF KHILLAR CATTLE AMONG DIFFERENT CATEGORIES OF FARMERS

5.2.1 Own use

In the present study, utilization pattern varies among different categories of farmers. Majority of the small (96.25%) and medium farmers (88.75%) who were using Khillar cattle for own use, used Khillar cattle for milking purpose. While none of the small and medium farmers used Khillar cattle for prestige/show purpose. Majority of the large farmers who were using Khillar cattle for own use, used Khillar cattle for manure purpose (97.50%) and equal percentage of large farmers used Khillar cattle for breeding and prestigious/show purpose (3.75%). Akila (2009) also reported that large farmers kept draught bullocks for prestigious/show purpose. In a similar study, Kuralkar *et al.* (2015) and Kauthale *et al.* (2019) indicated that majority of the livestock farmers reared indigenous animals for both milk and draught purpose.

5.2.2 Hiring out

In the present study, small farmers (83.75%) were using their Khillar bullocks for hiring out for agricultural activities. This is mainly because majority of the small farmers were focused on revenue generation as they had less land, seasonality of agricultural work and poor economic status. About 56.25 per cent of medium farmers and 17.20 per cent of large farmers hired out their Khillar bullocks.Nearly one fourth of small farmers (23.75%) followed by same per cent of medium and large farmers (15.00%) hired out their Khillar

bullocks for transportation. Among the overall farmers, 52.50 per cent farmers hired out their Khillar bullocks for the agricultural activities and 22.08 per cent for transportation. In a similar study, Akila (2009), Akila and Chander (2010) and Gadekar *et al*. (2017) reported that farmers maintained the animals mainly for ploughing in others' field, commercial carting and for both the activities, while, few bullock owners also used their bullocks for commercial carting apart from their own use. The previous studies also reported that draught bullocks were still a main source of farm power for small farmers, to certain extent for medium farmers and for certain operations among large farmers.

5.2.3 Other use

In the present study, none of the small, medium and large farmers used their Khillar cattle either for edible oil extraction or for electricity generation. This is mainly due to the high usage of electric oil mills due to technology advancements.

5.3 MARKETING PATTERN OF KHILLAR BREED

5.3.1 Procurement of Khillar breed by the farmer

In the present study, among the small farmers majority purchased Khillar cattle from the neighbours (43.75%) and among the medium (63.75%) and large farmers (57.50%), majority purchased Khillar cattle from the market. This clearly indicated that small farmers faced financial constraints and hence farmers purchased Khillar cattle on credit basis or on instalment basis with negotiation. Majority of the medium and large farmers purchase Khillar bullocks from the market. This could be due to wide range of availability of Khillar bullocks with different range of prizes. Only few per cent of farmers purchased from middle man which might be due to trust related aspects with the brokers.

These findings are in agreement with findings of Akila and Chander (2010) and Sudeep Kumar *et al*. (2015).

5.3.2 Market structure of the village where the Khillar cattle were exchanged

In the present study, equal per cent of the small, medium and large farmers (65.00%) had expressed that shandy was the place of marketing and equal percentage of small, medium and large farmers (15.00%) expressed that cattle fair was the place of marketing structure in their village. In a similar study, Sudeep Kumar *et al*. (2015) also opined that draught cattle were marketed mainly in shandies, cattle fairs and at home directly to buyers / farmers or with the help of brokers / commission agents.

Out of the 16 villages in the present study area, only Horti village of Indi taluk had the cattle fair in the month of December every year for the period of 7 days. The findings are in agreement with the findings of Sharma and Singh (1998), who reported that cattle fairs were organized for one to three weeks in a year in their study area and remaining villages had shandy as their cattle market.

5.3.3 Selection of good Khillar cattle

In the present study, among the overall farmers it could be observed that, 58.75 per cent of the farmers were selecting the Khillar animal based on the breed characteristics with hair whorls followed by hair whorls alone (21.25%) and breed characteristics alone (13.33%). This indicated that Khillar cattle which has both breed characteristics and hair whorls priced high in the market. In certain conditions like securing bank loans for purchase of Khillar cattle, farmers sought advice of the veterinary officer.

In a similar study, Mahesh (2013) reported that prize won in the competition, presence or absence of undesirable marks, breed characteristics, general appearance and age (number of front teeth and horn rings) had significant impact on price of bullock. Further, Akila and Chander (2010) also reported that the majority of the farmers selected animals based on their physical characteristics like body dimensions, conformation, and presence and position of hair whorls.

5.3.4 Livestock marketing pattern in cattle fair/ market

In the present study, none of the respondents among the small, medium and large farmers opined about open auction in the cattle fair or cattle market. Majority of the respondents among small farmers (83.75%), medium farmers (88.75%) and large farmers (95.00%) mentioned negotiation as the main marketing pattern in the cattle fair or cattle market. Respondents among small farmers (16.25%), medium farmers (11.25%) and large farmers (5.00%) mentioned that the undercover mechanism was the marketing pattern in the cattle fair or cattle market. Among the overall farmers, it could be observed that 89.58 per cent of the farmers expressed negotiation and 10.83 per cent opined undercover mechanism as the livestock marketing pattern in cattle fair/ market.

In a similar study, Sudeep Kumar *et al.* (2015) opined that draught cattle were marketed mainly in shandies, cattle fairs and at home directly to buyers / farmers and valuation of the animals was not fixed on scientific basis but through traditional method “Hatha” where the process of negotiation on pricing the animals was hidden.

5.3.5 Factors determining the economic value of Khillar breed

5.3.5.1 Khillar cow

In the present study, the major factors determining the economic value of Khillar cow were prize won in the competition, presence or absence of undesirable marks, breed characters and calf at foot. Age, parity, presence of undesirable marks, temperament and milk yield were ranked least.

Khillar cows are low milk producers and they yield on an average 2-4 litre of milk per day, therefore milk yield is not the main criteria for determining the economic value of Khillar cow. Prize won in the competition increases the value of Khillar cow because prizes were determined by the expert committee which involves Veterinary doctors. Higher age, parity and presence of undesirable marks had negative impact on economic value of Khillar cow. In a similar study, Mahesh (2013) reported that prize won in the competition, presence or absence of undesirable marks, breed characteristics, general appearance and age (number of front teeth and horn rings) had significant impact on price of cow.

5.3.5.2 Draft animal

Table 8 indicated that the major factors determining the economic value of Khillar bullocks were prize won in the competition, presence or absence of undesirable marks, breed characters and general appearance. Age and pair set were ranked least.

Khillar bullock price variations were determined by one quantitative (Age) and five qualitative characters (pair set, breed, general appearance, presence or absence of marks and prize won). All the five qualitative factors had significant influence on economic value

of bullocks. Being Khillar breed, winning a prize, breed characteristics, general appearance age, and pair set fetched additional economic value. But Khillar cattle with inauspicious marks loose its economic value. This revealed that farmers were ready to pay more price to Khillar bullocks which have won prize associated with prestige and recognition in society. Farmers' belief in fortune associated with marks on the body of animal they possess influenced price of cattle.

Mahesh (2013) also reported that prize won in the competition, presence or absence of undesirable marks, breed characteristics, general appearance and age (number of front teeth and horn rings) had significant impact on price of bullock.

5.3.6 Constraints in Khillar cattle marketing

Table 10 revealed that, the major problem in marketing of Khillar cattle was cheating by brokers (MS 67.63), followed by transportation (MS 63.56), lack of drinking water arrangements (MS 51.02), lack of animal sheds (MS 41.10), which were ranked as major constraints. Lack of loading/unloading dock (MS 23.20), lack of veterinary facilities (MS 19.39) and high market fee (MS 17.77) were ranked as least, indicating attention need to be given by the concerned authority.

Findings of the present study are in contrary to the findings of Mahesh (2013), Singh *et al*. (2006) and Kumar and Meganathan (2005) who reported lack of transportation facilities as major constraint. Further Kumar and Suhag (2003) and Rooparani (2007) reported lack of drinking water for animals and men as major constraint in cattle marketing. However, Rajarajan (2000) reported that non-remunerative price for cattle, absence of market regulation, lack of infrastructure facilities, high market charges, exploitation by

middlemen, inadequate transportation facilities and lack of market information as the major constraints in marketing.

5.4 CONSTRAINTS FACED BY THE LIVESTOCK FARMERS IN MANAGEMENT OF KHILLAR CATTLE OF KARNATAKA

5.4.1 Economic Constraints

In the present study, the first and foremost economic constraint faced by farmers in management of Khillar cattle was lack of credit facility from Government/ Banks (MS 56.01). Since majority of the farmers were economically poor, they required subsidized financial assistance from the banks. The second constraint ranked by the farmers was lack of subsidized insurance policy from Government (MS 46.81). Cattle rearing involves risk of loss due to death and incurable diseases and hence, farmers required subsidized insurance to their livestock to overcome the financial loss. High cost of animal (MS 43.92), high cost of implements and spares (MS 41.10) and high cost of feed (MS 40.36), low price of milk (MS 38.63), difficulty in finding market for sale (MS 31.88), reduction in demand of Khillar animal (MS 22.66) and high cost of treatment (MS 18.15) were ranked in descending order.

Findings of the present study are in line with the findings of Thombre *et al*. (2010) who reported, high prices of feed and fodder, low sale price of milk, costly veterinary services, high labour wages were the constraints which did not permit them to maintain the cattle. Further, Akila *et al*. (2016) concluded that the constraints in rearing draught bullocks includes mechanization, topographic variation, problem in soil, imbalanced land

use etc., while Ainlawar *et al*. (2012) reported that non-availability of loans and subsidy were the major economic constraints in rearing indigenous cattle.

5.4.2 Managerial constraints

In the present study, the first and foremost factor determining the managerial constraints was lack of labour (MS 68.55). Majority of the farmers were facing labour problem, which could be due to the fact that people were interested in other jobs which were highly remunerative. Second constraint was seasonality of agricultural work (MS 64.43), which could be due to majority of the farmers possessed rain fed agricultural land. Low productivity of cows (MS 62.07) was ranked as third constraint followed by less utility because of mechanization (MS 51.47). Lack of trained extension staff (MS 26.12) and non-availability of veterinary and AI services (MS 21.53) were ranked as least constraints.

Wagh *et al.* (2017) also reported that maintenance of bullock pair with wages of hired labour was the main constraint followed by increasing price of bullock pair and lack of sufficient work throught the year. Further, Kawuyol *et al*. (2012) reported that lack of feed resources, lack of village level repair services, availability of advanced implements and inadequate training of animals as the major constraints in utilization of draught animal power. While, Ainlawar *et al*. (2012) reported that non-availability of fodder throughout the year and shortage of grazing land as the major managerial constraints in rearing indigenous cattle.

Summary

VI. SUMMARY

In the present study, four districts were selected purposively possessing highest Khillar breed population in the state of Karnataka *viz*. Belagavi, Kalaburagi, Vijayapur and Haveri. From each district, 60 farmers possessing Khillar breed of cattle were randomly selected making a final sample size of 240 farmers with 80 small, 80 medium and 80 large farmers. The data was collected from farmers by personal interview method with the help of interview schedule keeping in view the objective of the study.

Major findings of the study

The major findings of the study are as below.

Socio economic and psychological characteristics of livestock farmers owning Khillar of Karnataka

It was observed that, among the overall respondents, large number of the respondents belong to middle age (43.34%) followed young (29.16%) and old age group (27.50%).

Majority of the respondents among all the small (87.50%), medium (97.50%) and large (90%) farmers were men, forming 91.66 per cent of the total respondents of the study area and the rest were women (8.34%).

Among the total respondents, 29.58 per cent had middle schooling followed by primary school (24.16%), high school (22.08%), PUC education (13.75%), graduation (7.93%) and illiterates (2.50%).

Among the overall caste of the respondents, 73.33 per cent belong to OBC category followed by General (15.83%), SC (9.16%) and ST category (1.68%).

Among the overall respondents, majority had medium family size (62.50%) followed by small (29.58%) and large family size (7.92%).

Among the total respondents, majority were living in nuclear family (92.08%) and only 7.92 per cent lived in joint family.

Among the overall respondents, animal husbandry with agriculture was found to be their main occupation (78.75%) followed by animal husbandry and agriculture with business (21.25%) as the major occupation.

Among the overall respondents, majority had medium level of Khillar cattle rearing experience (53.33%) followed by high (31.25%) and low (15.42%).

Among the overall respondents, majority had medium level of extension contact (56.26%) followed by high (29.16%) and low (14.58%).

Majority among the overall farmers had low annual income (56.66%) followed by medium (30.00%) and high (13.34%).

Among all the respondents, majority (28.34%) of the farmers were medium land holders followed by small (27.08%), large land holders (20.00%), marginal (14.45%) and landless farmers (12.22%).

Among the overall farmers, 47.5 per cent of them used Khillar bullocks and tractors asasource of farm power followed by Khillar bullocks only (46.25 %), and other machinery like power tiller (6.25 %).

Among the overall farmers, majority had medium level of decision making ability (65.84%) followed by high level (24.16%) and low level of decision making ability (10.00%).

Among the overall respondents, majority had medium (60.00%) level of risk orientation followed by high (26.25%) and low (13.75%) level of risk orientation

Utilization pattern of Khillar cattle among different categories of farmers

Among the overall farmers, who were using Khillar cattle for own use, used Khillar cattle for milking purpose (88.75%), followed by manure purpose (76.25%), agricultural activities (54.58%), carting purpose (43.75%), breeding purpose (7.50%) and for prestige/show purpose (1.25%).

Among the overall farmers, 52.50 per cent farmers hired out their Khillar bullocks for agricultural activities and 17.91 per cent for the transportation and none of the small, medium and large farmers used their Khillar cattle either for edible oil extraction or for electricity generation and it was found same for the overall respondents.

Marketing pattern of Khillar breed

Among the overall farmers, it could be observed that majority of the farmers purchased Khillar cattle from the market (54.59%) followed by neighbours (26.66%) and from the middle man (18.75%).

Equal per cent of the small (65.00%), medium (65.00%) and large (65.00%) farmers expressed that shandy was the marketing structure of their village and equal percentage of small (15.00%), medium (15.00%) and large farmers (15.00%) expressed that cattle fair was the marketing structure in their village.

Among the overall farmers it could be observed that 58.75 per cent of the farmers were selecting the Khillar animal based on the breed characteristics with hair whorls followed by hair whorls only (21.25%) and breed characteristics only (13.33%).

Among the overall farmers it could be observed that, 89.58 per cent of the farmers responded that negotiation was the marketing pattern followed by undercover mechanism (10.42%) in the market.

The first and foremost factor determining the value of Khillar cow was the prize won in the competition (MS 76.22), followed by presence or absence of undesirable marks (MS 73.59), breed characters (MS 59.70), calf at foot (MS 55.60) parity (MS 54.00), age (MS 49.00), general appearance (MS 43.30), health status (MS 40.50), temperament (MS 29.00) and milk yield (MS 18.00).

The first and foremost factor determining the economic value of Khillar bullock was the prize won in the competition (MS 72.80), followed by presence or absence of

undesirable marks (MS 67.20), breed characters (MS 54.00), general appearance (MS 46.00), age (MS 32.80) and pair set (MS27.20).

The major problem in marketing of Khillar cattle was cheating by brokers (MS 67.63), followed by transportation (MS 63.56), lack of drinking water arrangements (MS 51.02), lack of animal sheds (MS 41.10), lack of fodder (MS 38.33), absence of farmers rest house (MS 35.22), lack of hygiene (MS 34.19), uneven/ kaccha floor (MS 30.15), inadequate area for animal assembly (MS 29.10), lack of parking space (MS 27.67), lack of fencing (26.19), absence of internal roads in the market area (MS 24.55), lack of loading/unloading dock (MS 23.20), lack of veterinary facilities (MS 19.19), and high market fee (MS 17.77).

Constraints faced by the livestock farmers in management of Khillar cattle of Karnataka

The first and foremost economic constraints faced by livestock farmers in management of Khillar cattle was lack of credit facility from Government/ Banks (MS 56.01), and the second constraint was lack of subsidized insurance policy from Government (MS 46.81). Further, high cost of animal (MS 43.92) was ranked as third constraint followed by high cost of implements and spares (MS 41.10) and high cost of feed (MS 40.36). The sixth constraint was low price of milk (MS 38.63) whereas, difficulty in finding market for sale (MS 31.88) was seventh constraint. The eighth constraint was reduction in demand of Khillar animal (MS 22.66) and finally the high cost of treatment (MS 18.15) was ranked as ninth constraint.

The first and foremost factor determining the managerial constraints was lack of labour (MS 68.55) followed by seasonality of agricultural work (MS 64.43), low productivity of cows (MS 62.07), less utility because of mechanization (MS 51.47), changes from traditional farm practices (MS 47.65), lack of modern scientific implements (MS 45.30), poor management (MS 36.51), lack of trained extension staff (MS 26.12) and non-availability of veterinary and AI services (MS 21.53).

Conclusions and recommendations of the study

- ✓ The findings would help the policy makers to take necessary steps to provide subsidized loan and insurance policies motivating farmers in breed conservation
- ✓ The findings would help the policy makers to provide basic amenities in the cattle markets
- ✓ This study will help the policy makers to frame the strict rules to curb the middle man activities in the cattle markets.
- ✓ The utility of indigenous cow other than milk and draught power can be explored.
- ✓ Action research can be conducted by formation of breeders association for each of the livestock breed in Karnataka and its effect on conservation of animal genetic resources can be ascertained.

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Abstract

VIII. ABSTRACT

Over the years, there is a decline in the indigenous cattle population due to declining land holding and advancements in mechanization. Hence, an effort was made to analyze the utilization pattern, identify the marketing pattern and also to find the constraints faced by livestock farmers in management of Khillar cattle in Karnataka. The study was conducted in four districts possessing highest Khillar breed of cattle in Karnataka *viz*. Belagavi, Kalaburagi, Vijayapur and Haveri with total sample size of 240 respondents. The data was collected through personal interview method using a pretested semi-structured interview schedule and observation. The study found that majority of the respondents availed farm power by using Khillar bullocks and tractors followed by Khillar bullocks only. With regards to marketing pattern, it was found that majority of the farmers purchased Khillar cattle from the market followed by their neighbors in cattle shandy or cattle fair based on the breed characteristics followed by based on hair whorls. Majority of the farmers followed negotiation followed by undercover mechanism and determined the economic value of Khillar cow based on the prize won in the competition, followed by presence or absence of undesirable marks and breed characters. Further, cheating by brokers followed by transportation were the major problems in marketing of Khillar cattle. Major economic constraints were lack of credit facility from Government/ Banks followed by lack of subsidized insurance policy from Government and high cost of animal while, major managerial constraints expressed by farmers were lack of labour followed by seasonality of agricultural work. The study recommends to conduct comprehensive studies for different breeds in their home tracts for quantification of utility and draught animal power generation. Further, comparative economical studies between indigenous cattle, crossbred cattle and mechanization may also be conducted.

ಕರ್ನಾಟಕದ ಖಿಲ್ಲಾರ ತಳಿ - ಒಂದು ವಿವರಣಾತ್ಮಕ ಅಧ್ಯಯನ

ರಾಜಶೇಖರ ಕಾರಜೋಳ **ಎಂ.ವಿ. ಎಚ್.ಕೆ. ೧೯೩೩**

ಸಾರಾಂಶ

ವರ್ಷದಿಂದ ವರ್ಷಕ್ಕೆ ಕ್ಷೀಣಿಸುತ್ತಿರುವ ಭೂ ಹಿಡುವಳಿ ಮತ್ತು ಯಾಂತ್ರೀಕರಣದ ಪ್ರಗತಿಯಿಂದಾಗಿ ದೇಶಿ ಜಾನುವಾರುಗಳ ಸಂಖ್ಯೆ ಇಳಿಮುಖವಾಗಿದೆ. ಆದ್ದರಿಂದ ಖಿಲ್ಲಾರ ತಳಿಯ ಬಳಕೆಯ ವಿಧಾನವನ್ನು ವಿಶ್ಲೇಷಿಸಲು, ಮಾರುಕಟ್ಟೆ ಮಾದರಿಯನ್ನು ಗುರುತಿಸಲು ಮತ್ತು ಕರ್ನಾಟಕದ ಖಿಲ್ಲಾರ ಜಾನುವಾರುಗಳ ನಿರ್ವಹಣೆಯಲ್ಲಿ ಜಾನುವಾರು ರೈತರು ಎದುರಿಸುತ್ತಿರುವ ಸಮಸ್ಯೆಗಳನ್ನು ಕಂಡುಹಿಡಿಯಲು ಪ್ರಯತ್ನಿಸಲಾಗಿದೆ. ಕರ್ನಾಟಕದಲ್ಲಿ ಅತಿ ಹೆಚ್ಚು ಖಿಲ್ಲಾರ ತಳಿಯ ಜಾನುವಾರುಗಳನ್ನು ಹೊಂದಿರುವ ನಾಲ್ಕು ಜಿಲ್ಲೆಗಳಾದ ಬೆಳಗಾವಿ, ಕಲಬುರಗಿ, ವಿಜಯಪುರ ಮತ್ತು ಹಾವೇರಿ ಜಿಲ್ಲಗಳಲ್ಲಿನ ಒಟ್ಟು ಮಾದರಿ ಗಾತ್ರದ 240 ಖಿಲ್ಲಾರ ತಳಿ ಹೊಂದಿರುವ ರೈತರನ್ನು ಬಳಸಿಕೊಂಡು ಪೂರ್ವ ಪರೀಕ್ಷಿತ ಅರೆ ರಚನಾತ್ಮಕ ಸಂದರ್ಶನ ವೇಳಾ ಪಟ್ಟಿಯನ್ನು ಬಳಸಿಕೊಂಡು ವೈಯಕ್ತಿಕ ಸಂದರ್ಶನ ವಿಧಾನದ ಮೂಲಕ ಮಾಹಿತಿಯನ್ನು ಸಂಗ್ರಹಿಸಲಾಗಿದೆ. ಪ್ರತಿಕ್ರಯಿಸಿದವರಲ್ಲಿ ಹೆಚ್ಚಿನವರು ಖಿಲ್ಲಾರ ಎತ್ತುಗಳು ಮತ್ತು ಟ್ರ್ಯಾಕ್ಟರ್‌ಗಳನ್ನು ಬಳಸುವ ಮೂಲಕ ಕೃಷಿ ಚಟುವಟಿಕೆ ನಡೆಸುತ್ತಿದ್ದಾರೆಂದು ಅಧ್ಯಯನದಿಂದ ತಿಳಿದುಬಂದಿದೆ. ಖಿಲ್ಲಾರ ಜಾನುವಾರು ಮಾರಾಟಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ ಬಹುತೇಕ ರೈತರು ಅವುಗಳನ್ನು ಮಾರುಕಟ್ಟೆಯಿಂದ ಹಾಗೂ ಕೆಲವು ರೈತರು ಅವರ ನರೆಹೊರೆಯವರಿಂದ ಹಾಗೂ ಜಾನುವಾರು ಸಂತೆ ಅಥವಾ ಜಾನುವಾರು ಜಾತ್ರೆಯಲ್ಲಿ ತಳಿ ಗುಣ ಲಕ್ಷಣಗಳನ್ನು ಮತ್ತು ಕೂದಲುಸುರುಳಿಗಳನ್ನು ಆಧರಿಸಿ ಖಿಲ್ಲಾರ ರಾಸುಗಳನ್ನು ಖರೀದಿಸುವ ಪದ್ಧತಿ ಇದೆ. ಬಹುಪಾಲು ರೈತರು ಸಂಧಾನದ ನಂತರ ಗೌಪ್ಯ ವಿಧಾನವನ್ನು ಖಿಲ್ಲಾರ ರಾಸುಗಳ ಖರೀದಿಯಲ್ಲಿ ಅನುಸರಿಸುವರು ಮತ್ತು ಸ್ಪರ್ದೆಯಲ್ಲಿ ಗೆದ್ದ ಬಹುಮಾನದ ಆಧಾರದ ಮೇಲೆ ಖಿಲ್ಲಾರ ತಳಿಯ ಆರ್ಥಿಕ ಮೌಲ್ಯವನ್ನು ನಿರ್ಧರಿಸುವರು. ನಂತರ ದೇಹದ ಮೇಲಿನ ಅನಪೇಕ್ಷಿತ ಗುರುತುಗಳು ಮತ್ತು ತಳಿಯ ಗುಣಲಕ್ಷಣಗಳ ಉಪಸ್ಥಿತಿ ಅಥವಾ ಅನುಪಸ್ಥಿತಿಯನ್ನು ಆಧರಿಸಿ ಖಿಲ್ಲಾರ ತಳಿಯ ಆರ್ಥಿಕ ಮೌಲ್ಯವನ್ನು ನಿರ್ಧರಿಸುವುರು. ದಲ್ಲಾಳಿಗಳಿಂದ ವಂಚನೆ ಮತ್ತು ಸಾಗಾಣಿಕೆಯಲ್ಲಿನ ತೊಂದರೆಗಳು ಖಿಲ್ಲಾರ ಜಾನುವಾರುಗಳ ಮಾರುಕಟ್ಟೆಯ ಪ್ರಮುಖ ಸಮಸ್ಯೆಗಳಾಗಿವೆ. ಪ್ರಮುಖ ಆರ್ಥಿಕ ನಿರ್ಬಂಧಗಳೆಂದರೆ ಸರ್ಕಾರದಿಂದ/ ಬ್ಯಾಂಕುಗಳಿಂದ ಸಾಲ ಸೌಲಭ್ಯದ ಕೊರತೆ ಮತ್ತು ಸರ್ಕಾರದಿಂದ ಸಬ್ಸಿಡಿ ಸಹಿತ ವಿಮಾ ಪಾಲಿಸಿಯ ಕೊರತೆ ಮತ್ತು ಪ್ರಾಣಿಗಳ ಹೆಚ್ಚಿನ ಬೆಲೆ. ರೈತರು ವ್ಯಕ್ತ ಪಡಿಸಿದ ಪ್ರಮುಖ ನಿರ್ವಹಣಾ ನಿರ್ಬಂಧಗಳೆಂದರೆ ಕಾರ್ಮಿಕರ ಕೊರತೆ ಮತ್ತು ಹವಮಾನ ಆಧರಿತ ಕೃಷಿ ಕೆಲಸ. ಈ ಅಧ್ಯಯನವು ದೇಶಿ ಹೋರಿ/ ಎತ್ತುಗಳ/ ವಿವಿಧ ತಳಿಗಳ, ವಿವಿಧ ಉಪಯೋಗಗಳ ಸಮಗ್ರ ಅಧ್ಯಯನಗಳನ್ನು ನಡೆಸಲು ಶಿಫಾರಸ್ಸು ಮಾಡುತ್ತದೆ. ಇದಲ್ಲದೆ, ತುಲನಾತ್ಮಕ ಆರ್ಥಿಕ ಅಧ್ಯಯನಗಳನ್ನು ಸಹ ನಡೆಸಬಹುದು.

Annexures

IX. ANNEXURES

KHILLAR CATTILE OF KARNATAKA - A DESCRIPTIVE STUDY

ಕರ್ನಾಟಕದ ಖಿಲ್ಲಾರ ತಳಿ - ಒಂದು ವಿವರಣಾತ್ಮಕ ಅಧ್ಯಯನ

INTERVIEW SCHEDULE

ಸಂದರ್ಶನ ಪ್ರತಿ

Respondent no: ರೈತರ ಸಂಖ್ಯೆ: District: ಜಿಲ್ಲೆ :

Taluk: ತಾಲೂಕು: Village: ಗ್ರಾಮ:

Category: ವರ್ಗ: SF/MF/LF

I. Personal and socio economic characteristics of livestock farmers owning Khillar cattle of Karnataka:

ಕರ್ನಾಟಕದ ಖಿಲ್ಲಾರ ಜಾನುವಾರುಗಳನ್ನು ಹೊಂದಿರುವ ಜಾನುವಾರು ರೈತರ ವೈಯಕ್ತಿಕ ಮತ್ತು ಸಾಮಾಜಿಕ ಆರ್ಥಿಕ ಗುಣಲಕ್ಷಣಗಳು:

1. Name of the respondent: ರೈತರ ಹೆಸರು
2. Age: ವಯಸ್ಸು:
3. Gender: ಲಿಂಗ
4. Education: ಶಿಕ್ಷಣ:

Illiterate ಅನಕ್ಷರಸ್ಥ	Primary School ಪ್ರಾಥಮಿಕ ಶಾಲೆ	Middle Schoo ಮಾಧ್ಯಮಿಕ ಶಾಲೆ ಶಾಲೆ	High school ಪ್ರೌಢಶಾಲೆ	PUC ಪಿಯುಸಿ	Graduation and above ಪದವಿ ಮತ್ತು ಮೇಲ್ಪಟ್ಟು

5. Caste : ಜಾತಿ : General / OBC/SC/ST

6. Family size: ಕುಟುಂಬದ ಗಾತ್ರ:

Category **ವರ್ಗ**	**Number of family members** **ಕುಟುಂಬದ ಸದಸ್ಯರ ಸಂಖ್ಯೆ**	Tick ☑
Small (ಚಿಕ್ಕದು)	1-3	
Medium (ಮಧ್ಯಮ)	4-6	
Large (ದೊಡ್ಡದು)	7-9	

7. Family type: Joint/Nuclear

ಕುಟುಂಬದ ಪ್ರಕಾರ: ಅವಿಭಕ್ತ/ ವಿಭಕ್ತ

8. Occupation: ಉದ್ಯೋಗ:

Sl. No. **ಸಂ:**	**Occupation Type** **ಉದ್ಯೋಗದ ಪ್ರಕಾರ**	**Tick** ☑
1.	Agriculture + animal husbandry (ಕೃಷಿ + ಪಶುಸಂಗೋಪನೆ)	
2.	Agriculture+ animal husbandry+ business (ಕೃಷಿ+ ಪಶುಪಾಲನೆ+ ವ್ಯಾಪಾರ)	

8. Khillar cattle rearing experience (years):

ಖಿಲ್ಲರ್ ಜಾನುವಾರು ಸಾಕಣೆ ಅನುಭವ (ವರ್ಷಗಳು):

9. Sources of Information about Management Practices of Khillar Cattle (Extension contact):

ಖಿಲ್ಲರ್ ಜಾನುವಾರುಗಳ ನಿರ್ವಹಣಾ ಅಭ್ಯಾಸಗಳ ಬಗ್ಗೆ ಮಾಹಿತಿಯ ಮೂಲಗಳು (ವಿಸ್ತರಣೆ ಸಂಪರ್ಕ):

Sl. No. **ಸಂ:**	**Sources** **ಮೂಲಗಳು**	**F**	**S**	N
1.	Family members (ಕುಟುಂಬದ ಸದಸ್ಯರು)			
2.	Friends and relatives (ಸ್ನೇಹಿತರು ಮತ್ತು ಸಂಬಂಧಿಕರು)			

3.	Neighbours (ನೆರೆ)			
4.	Village key persons (ಗ್ರಾಮದ ಪ್ರಮುಖ ವ್ಯಕ್ತಿಗಳು)			
5.	Veterinary dispensary (ಪಶು ಚಿಕಿತ್ಸಾಲಯ)			
6.	Vet universities/ Colleges/ Training centres (ಪಶುವೈದ್ಯಕೀಯ ವಿಶ್ವವಿದ್ಯಾಲಯಗಳು/ ಕಾಲೇಜುಗಳು/ ತರಬೇತಿ ಕೇಂದ್ರಗಳು)			
7.	KVK (Extension Organizations) (ವಿಸ್ತರಣಾ ಸಂಸ್ಥೆಗಳು)			
8.	NGO's (NGO ಗಳು)			
9.	Newspapers/ magazine/ Books (ಪತ್ರಿಕೆಗಳು/ ನಿಯತಕಾಲಿಕೆಗಳು/ ಪುಸ್ತಕಗಳು)			
10.	TV / Radio (ಟಿವಿ / ರೇಡಿಯೋ)			
11.	Social Media (ಸಾಮಾಜಿಕ ಮಾಧ್ಯಮ)			

F: Frequently S: Sometimes N: Never ಆಗಾಗ್ಗೆ ಕೆಲವೊಮ್ಮೆ ಎಂದಿಗೂ ಇಲ್ಲ

10. **Annual family income** in ₹: ……

ಕುಟುಂಬದ ವಾರ್ಷಿಕ ಆದಾಯ ₹: .....

Sl. No. **ಸಂ**	**Category** **ವರ್ಗ**	**Amount** **ಮೊತ್ತ**
1.	Livestock (ಜಾನುವಾರು)	
2.	Agriculture (ಕೃಷಿ)	
3.	Other sources (ಇತರ ಮೂಲಗಳು)	
4.	Total (in rupees) ಒಟ್ಟು (ರೂಪಾಯಿಗಳಲ್ಲಿ)	

11. **Land holding:** Dry….. Irrigated….. Landless….. Total =

ಜಮೀನು ಹಿಡುವಳಿ: ಒಣ..... ನೀರಾವರಿ.... ಭೂರಹಿತ..... ಒಟ್ಟು =

12. **Source of Farm power:** Tractor/ Khillar Bullocks /Any Others

ಕೃಷಿ ಶಕ್ತಿಯ ಮೂಲ: ಟ್ರ್ಯಾಕ್ಟರ್/ ಖಿಲ್ಲಾರ ಎತ್ತು/ ಇತರೆ

14. Khillar Owners Livestock Possession (ಖಿಲ್ಲಾರ ರೈತರು ಹೊಂದಿರುವ ಜಾನುವಾರುಗಳು)

Sl. No. **ಸಂ.**	**Animal Type** **ಪ್ರಾಣಿ ಪ್ರಕಾರ**	**Number** **ಸಂಖ್ಯೆ**
1.	Khillar Bull (ಖಿಲ್ಲಾರ ಹೋರಿ)	
2.	Khillar Bullock (ಖಿಲ್ಲಾರ ಎತ್ತು)	
3.	Khillar Cow (ಖಿಲ್ಲಾರ ಎತ್ತು)	
4.	Khillar Male Calf (ಖಿಲ್ಲಾರ ಗಂಡು ಕರು)	
5.	Khillar Female Calf (ಖಿಲ್ಲಾರ ಹೆಣ್ಣು ಕರು)	
6.	Cross bred cows (ಮಿಶ್ರ ತಳಿ ಹಸು)	
7.	Buffaloes (ಎಮ್ಮೆ)	
8.	Sheep (ಕುರಿ)	
9.	Goat (ಆಡು)	
10.	Others (ಇತರೆ)	

II. Psychological characteristics of Livestock Farmers:

ಜಾನುವಾರು ಸಾಕಣೆದಾರರ ಮಾನಸಿಕ ಗುಣಲಕ್ಷಣಗಳು:

1. Dicision making ability: (ನಿರ್ಣಯ ಮಾಡುವ ಸಾಮರ್ಥ್ಯ) :

Sl. No. **ಸಂ.**	**Dicision making** **ನಿರ್ಣಯ ಮಾಡುವುದು**	**Agree** **ಒಪ್ಪುತ್ತೇನೆ**	**Undecided** **ನಿರ್ಧರಿಸಲಾಗಿಲ್ಲ**	**Disagree** **ಒಪ್ಪುವುದಿಲ್ಲ**
1.	Fodder purchase (ಮೇವು ಖರೀದಿ)			
2.	Animal purchasing (ಪ್ರಾಣಿಗಳ ಖರೀದಿ)			
3.	Insurance of animals (ಪ್ರಾಣಿಗಳ ವಿಮೆ)			
4.	Applying new practices, idea and technologies (ಹೊಸ ಅಭ್ಯಾಸಗಳು, ವಿಚಾರಗಳು ಮತ್ತು ತಂತ್ರಜ್ಞಾನಗಳನ್ನು ಅನ್ವಯಿಸುವುದು)			
5.	Practicing AI (ಕೃತಕ ಗರ್ಭಧಾರಣೆ)			

6.	Vaccination against contagious diseases (ಸಾಂಕ್ರಾಮಿಕ ರೋಗಗಳ ವಿರುದ್ಧ ಲಸಿಕೆ ಹಾಕುವುದು)			
7.	Milk selling (ಹಾಲು ಮಾರಾಟ)			
8.	Deworming (ಜಂತುಹುಳು ನಿವಾರಣೆ)			

2. Risk orientation: (ಅಪಾಯದ ದೃಷ್ಟಿಕೋನ)

Sl. No. ಸಂ.	**Risk orientation ಅಪಾಯದ ದೃಷ್ಟಿಕೋನ**	**Agree ಒಪ್ಪುತ್ತೇನೆ**	**Undecided ನಿರ್ಧರಿಸಲಾಗಿಲ್ಲ**	**Disagree ಒಪ್ಪುವುದಿಲ್ಲ**
1.	Farmer with Khillar cattle should take greater risk than the average farmer ಖಿಲ್ಲಾರ ದನಗಳನ್ನು ಹೊಂದಿರುವ ರೈತ ಸಾಮಾನ್ಯ ರೈತರಿಗಿಂತ ಹೆಚ್ಚಿನ ಅಪಾಯವನ್ನು ತೆಗೆದುಕೊಳ್ಳಬೇಕು			
2.	Farmer should keep improved breed instead of Local breed ರೈತರು ಸ್ಥಳೀಯ ತಳಿಯ ಬದಲು ಸುಧಾರಿತ ತಳಿಯನ್ನು ಇಟ್ಟುಕೊಳ್ಳಬೇಕು			
3.	Khillar cattle rearing is less profitable than dairy animals ಡೈರಿ ಪ್ರಾಣಿಗಳಿಗಿಂತ ಖಿಲ್ಲಾರ ಜಾನುವಾರು ಸಾಕಣೆ ಕಡಿಮೆ ಲಾಭದಾಯಕವಾಗಿದೆ			
4.	Mechanization is the main cause for less utilization of khillar cattle in farming activities. ಕೃಷಿ ಚಟುವಟಿಕೆಗಳಲ್ಲಿ ಖಿಲ್ಲಾರ ಜಾನುವಾರುಗಳ ಕಡಿಮೆ ಬಳಕೆಗೆ ಯಾಂತ್ರೀಕರಣವು ಮುಖ್ಯ ಕಾರಣವಾಗಿದೆ.			
5.	Marketing price of khillar cattle is decreasing day by day ಖಿಲ್ಲಾರ ಜಾನುವಾರುಗಳ ಮಾರುಕಟ್ಟೆ ಬೆಲೆ ದಿನದಿಂದ ದಿನಕ್ಕೆ ಕಡಿಮೆಯಾಗುತ್ತಿದೆ			
6.	Khillar cow milk has lesser price compared to cross bred cows ಮಿಶ್ರತಳಿ ಹಸುಗಳಿಗೆ ಹೋಲಿಸಿದರೆ ಖಿಲ್ಲಾರ ಹಸುವಿನ ಹಾಲಿಗೆ ಕಡಿಮೆ ಬೆಲೆ ಇದೆ			

7.	Proper marketing channels can improve the sale and price of Khillar cow's milk. ಸರಿಯಾದn ಮಾರ್ಕೆಟಿಂಗ್ ಚಾನೆಲ್‌ಗಳು ಖಿಲ್ಲಾರ ಹಸುವಿನ ಹಾಲಿನ ಮಾರಾಟ ಮತ್ತು ಬೆಲೆಯನ್ನು ಸುಧಾರಿಸಬಹುದು.			
8.	Farmers with khillar cattle should procure newly launched feed supplements rather than traditional feed supplements. ಖಿಲ್ಲಾರ ಜಾನುವಾರುಗಳನ್ನು ಹೊಂದಿರುವ ರೈತರು ಸಾಂಪ್ರದಾಯಿಕ ಆಹಾರ ಪೂರಕಗಳಿಗಿಂತ ಹೊಸದಾಗಿ ಪ್ರಾರಂಭಿಸಲಾದ ಆಹಾರ ಪೂರಕಗಳನ್ನು ಖರೀದಿಸಬೇಕು.			

III. Utilization pattern of Khillar cattle among different categories of farmers.

ವಿವಿಧ ವರ್ಗದ ರೈತರಲ್ಲಿ ಖಿಲ್ಲಾರ ಜಾನುವಾರುಗಳ ಬಳಕೆಯ ಮಾದರಿ.

Sl. No. **ಸಂ.**	**Activities** **ಚಟುವಟಿಕೆಗಳು**	**Yes** **ಹೌದು**	**No** **ಇಲ್ಲ**
1.	**Own Use** **ಸ್ವಂತ ಬಳಕೆ**		
.	**a. Agriculture activities (ಕೃಷಿ ಚಟುವಟಿಕೆಗಳು)** **b. Transportation (ಸಾರಿಗೆ)** **c. Manuare (ಗೊಬ್ಬರ)** **d. Carting (ಸಾಗಾಣಿಕೆ)** **e. Beeding purpose (ಸಂತಾನೋತ್ಪತ್ತಿ)** **f. Prestige/Show purpose (ಪ್ರದರ್ಶನ)**		
2.	**Hiring out** **a. Agriculture activities (ಕೃಷಿ ಚಟುವಟಿಕೆಗಳು)** **b. Transportation (ಸಾರಿಗೆ)**		
3.	**Others** **a. Edible oil extraction (ಖಾದ್ಯ ತೈಲ ಹೊರತೆಗೆಯುವಿಕೆ)** **b. Electricity generation (ವಿದ್ಯುತ್ ಉತ್ಪಾದನೆ)**		

IV. Marketing Pattern of Khillar Breed: (ಖಿಲ್ಲಾರ ತಳಿಯ ಮಾರಾಟದ ಮಾದರಿ):

1. Procurement of Khillar animal:

   ಖಿಲ್ಲಾರ ಪ್ರಾಣಿಗಳ ಖರೀದಿ:

   From where do you Purchase the Khillar Cattle

   ನೀವು ಖಿಲ್ಲಾರ ದನಗಳನ್ನು ಎಲ್ಲಿಂದ ಖರೀದಿಸುತ್ತೀರಿ

   1. From Market (ಮಾರುಕಟ್ಟೆಯಿಂದ): 2. From neighbours (ನೆರೆಹೊರೆಯವರಿಂದ):

   3. From middle man (ಮಧ್ಯವರ್ತಿಯಿಂದ) : 4. Other sources (ಇತರ ಮೂಲಗಳು) :

2. Market Structure in your village where khillar breed is exchanged?

   ಖಿಲ್ಲಾರ ತಳಿಯನ್ನು ವಿನಿಮಯ ಮಾಡಿಕೊಳ್ಳುವ ನಿಮ್ಮ ಗ್ರಾಮದಲ್ಲಿ ಮಾರುಕಟ್ಟೆಯ ರಚನೆ?

   1. Shandy (ಜಾನುವಾರು ಸಂತೆ) 2.Cattle Fair (ದನಗಳ ಜಾತ್ರೆ)

   3. Both (ಎರಡೂ)

3. How do you select a good Khillar cattle.?

   ಉತ್ತಮ ಖಿಲ್ಲಾರ ದನವನ್ನು ಹೇಗೆ ಆಯ್ಕೆ ಮಾಡುತ್ತೀರಿ.?

   1. Physical appearance /Breed characteristics (ದೈಹಿಕ ನೋಟ / ತಳಿ ಗುಣಲಕ್ಷಣಗಳು).

   2. Hair whorls (ಕೂದಲು ಸುರುಳಿಗಳು).

   3. Both (ಎರಡೂ).

   4. By the advice of Veterinary officer (ಪಶುವೈದ್ಯಾಧಿಕಾರಿಯ ಸಲಹೆಯಿಂದ)

4. What are the livestock marketing patterns In Cattle Fair/ Cattle Market?

   ಜಾನುವಾರು ಮೇಳ/ಜಾನುವಾರು ಮಾರುಕಟ್ಟೆಯಲ್ಲಿ ಜಾನುವಾರು ಮಾರಾಟದ ಮಾದರಿಗಳು ಯಾವುವು?

   1. Open auction (ಬಹಿರಂಗ ಹರಾಜು). 2. Negotiation (ಮಾತುಕತೆ).

   3. Under Cover Mechanism (ಕವರ್ ಪದ್ಧತಿ). 4. Any other (ಯಾವುದೇ ಇತರೆ).

5. What are the factors determining the economic value of khillar breed?

   ಖಿಲ್ಲಾರ ತಳಿಯ ಆರ್ಥಿಕ ಮೌಲ್ಯವನ್ನು ನಿರ್ಧರಿಸುವ ಅಂಶಗಳು ಯಾವುವು?

Milch Animals: (ಹಾಲುಣಿಸುವ ಪ್ರಾಣಿಗಳು).

Sl. No. **ಸಂ.**	**Factors** **ಅಂಶಗಳು**	**Rank** **ಶ್ರೇಣಿ**
1.	Milk yield (ಹಾಲಿನ ಇಳುವರಿ).	
2.	Age (ವಯಸ್ಸು).	
3.	Parity (ಸೂಲು).	
4.	Calf at foot (ಹಸುವಿನೊಂದಿಗೆ ಕರು ಇರುವಿಕೆ)	
5.	Breed characters (ತಳಿಯ ಗುಣಧರ್ಮಗಳು)	
6.	General appearance (ಸಾಮಾನ್ಯ ಲಕ್ಷಣಗಳು)	
7.	Temperment (ಮನೋಧರ್ಮ)	
8.	Prize won in the competition (ಸ್ಪರ್ಧೆಯಲ್ಲಿ ಬಹುಮಾನ ಗೆದ್ದಿರುವುದು)	
9.	Health status (ಆರೋಗ್ಯ ಸ್ಥಿತಿ)	
10.	Presence / absence of undesirable marks (ಅನಪೇಕ್ಷಿತ ಗುರುತುಗಳ ಉಪಸ್ಥಿತಿ / ಅನುಪಸ್ಥಿತಿ)	

Draft Animals: (ಎತ್ತು/ಹೋರಿಗಳು).

Sl. No. **ಸಂ.**	**Factors** **ಅಂಶಗಳು**	**Rank** **ಶ್ರೇಣಿ**
1.	Age (ವಯಸ್ಸು)	
2.	Pair set (ಜೋಡಿ)	
3.	General appearance (ಸಾಮಾನ್ಯ ಲಕ್ಷಣಗಳು)	
4.	Breed characters (ತಳಿಯ ಗುಣಧರ್ಮಗಳು)	

5.	Presence/ absence of undesirable marks (ಅನಪೇಕ್ಷಿತ ಗುರುತುಗಳ ಉಪಸ್ಥಿತಿ / ಅನುಪಸ್ಥಿತಿ):	
6.	Prize won in competition (ಸ್ಪರ್ಧೆಯಲ್ಲಿ ಬಹುಮಾನ ಗೆದ್ದಿರುವುದು)	

6. Problems In Khillar Cattle Marketing

ಖಿಲ್ಲಾರ ಜಾನುವಾರು ಮಾರಾಟದಲ್ಲಿ ಸಮಸ್ಯೆಗಳು.

Sl. No. ಸಂ.	**Problem ಸಮಸ್ಯೆ**	**Rank ಶ್ರೇಣಿ**
1.	Transportation Problem (ಸಾರಿಗೆ ಸಮಸ್ಯೆ).	
2.	Lack of loading/ unloading dock (ಏರುವಿಕೆ / ಇಳಿಸುವಿಕೆಗೆ ಸೂಕ್ತ ವ್ಯವಸ್ತೆ ಇಲ್ಲದಿರುವುದು).	
3.	Lack of parking space (ಪಾರ್ಕಿಂಗ್ ಜಾಗದ ಕೊರತೆ)	
4.	Inadequate area for animal assembly (ಪ್ರಾಣಿಗಳ ಕೂಡುವಿಕೆಗೆ ಅಸಮರ್ಪಕ ಪ್ರದೇಶ)	
5.	Lack of animal sheds (ಪ್ರಾಣಿಗಳ ಶೆಡ್‌ಗಳ ಕೊರತೆ)	
6.	Uneven/ kachha floor (ಅಸಮ/ಕಚ್ಚಾ ನೆಲ).	
7.	Absence of internal roads in the market area (ಮಾರುಕಟ್ಟೆ ಪ್ರದೇಶದಲ್ಲಿ ಆಂತರಿಕ ರಸ್ತೆಗಳ ಕೊರತೆ).	
8.	Lack of fencing (ಫೆನ್ಸಿಂಗ್ ಕೊರತೆ).	
9.	Absence of farmers rest house (ರೈತರ ವಿಶ್ರಾಂತಿ ಗೃಹ ಇಲ್ಲದಿರುವುದು)	
10.	Lack of drinking water facilities (ಕುಡಿಯುವ ನೀರಿನ ಸೌಲಭ್ಯಗಳ ಕೊರತೆ)	
11.	Lack of hygiene (ನೈರ್ಮಲ್ಯದ ಕೊರತೆ)	
12.	Lack of veterinary facilities (ಪಶುವೈದ್ಯಕೀಯ ಸೌಲಭ್ಯಗಳ ಕೊರತೆ).	
13.	High market fee (ಹೆಚ್ಚಿನ ಮಾರುಕಟ್ಟೆ ಶುಲ್ಕ)	
14.	Cheating by brokers (ದಲ್ಲಾಳಿಗಳಿಂದ ವಂಚನೆ)	
15.	Lack of fodder (ಮೇವಿನ ಕೊರತೆ)	

7. Constraints faced by the livestock farmers in management of Khillar cattle of Karnataka.

ಕರ್ನಾಟಕದ ಖಿಲ್ಲಾರ ಜಾನುವಾರುಗಳ ನಿರ್ವಹಣೆಯಲ್ಲಿ ಜಾನುವಾರು ಸಾಕಣೆದಾರರು ಎದುರಿಸುತ್ತಿರುವ ನಿರ್ಬಂಧಗಳು.

A. Economic constraints: (ಆರ್ಥಿಕ ನಿರ್ಬಂಧಗಳು).

Sl. No. ಸಂ.	**Constraints** ನಿರ್ಬಂಧಗಳು	**Rank** ಶ್ರೇಣಿ
1.	High cost of animal (ಪ್ರಾಣಿಗಳ ಹೆಚ್ಚಿನ ವೆಚ್ಚ)	
2.	High cost of treatment (ಚಿಕಿತ್ಸೆಯ ಹೆಚ್ಚಿನ ವೆಚ್ಚ)	
3.	High cost of feed (ಆಹಾರದ ಹೆಚ್ಚಿನ ವೆಚ್ಚ)	
4.	High cost of implements and spares (ಉಪಕರಣಗಳು ಮತ್ತು ಬಿಡಿಭಾಗಗಳ ಹೆಚ್ಚಿನ ವೆಚ್ಚ)	
5.	Lack of subsidized insurance policy from Government (ಸರ್ಕಾರದಿಂದ ಸಬ್ಸಿಡಿ ಸಹಿತ ವಿಮಾ ಪಾಲಿಸಿಯ ಕೊರತೆ).	
6.	Lack of credit facility from Government/ Banks (ಸರ್ಕಾರ/ಬ್ಯಾಂಕ್‌ಗಳಿಂದ ಸಾಲ ಸೌಲಭ್ಯದ ಕೊರತೆ)	
7.	Reduction in demand of Khillar animals (ಖಿಲ್ಲಾರ ಪ್ರಾಣಿಗಳ ಬೇಡಿಕೆಯಲ್ಲಿ ಕಡಿತ)	
8.	Low price for milk (ಹಾಲಿಗೆ ಕಡಿಮೆ ಬೆಲೆ)	
9.	Difficulty in finding market for sale (ಮಾರಾಟಕ್ಕೆ ಮಾರುಕಟ್ಟೆಯನ್ನು ಹುಡುಕುವಲ್ಲಿ ತೊಂದರೆ)	

B. Managerial constraints: (ನಿರ್ವಹಣಾ ನಿರ್ಬಂಧಗಳು):

Sl. No. ಸಂ.	**Constraints** ನಿರ್ಬಂಧಗಳು	**Rank** ಶ್ರೇಣಿ
1.	Lack of labour (ಕಾರ್ಮಿಕರ ಕೊರತೆ)	
2.	Seasonality of agricultural work (ಋತುಮಾನ ಆಧಾರಿತ ಕೃಷಿ ಕೆಲಸ)	

3.	Poor management (ಕಳಪೆ ನಿರ್ವಹಣೆ)	
4.	Lack of modern scientific implements (ಆಧುನಿಕ ವೈಜ್ಞಾನಿಕ ಉಪಕರಣಗಳ ಕೊರತೆ)	
5.	Lack of trained extension staff (ತರಬೇತಿ ಪಡೆದ ವಿಸ್ತರಣಾ ಸಿಬ್ಬಂದಿ ಕೊರತೆ)	
6.	Changes from traditional farm practices (ಸಾಂಪ್ರದಾಯಿಕ ಕೃಷಿ ಪದ್ಧತಿಗಳ ಬದಲಾವಣೆಗಳು)	
7.	Less utility because of mechanization (ಯಾಂತ್ರೀಕರಣದ ಕಾರಣ ಕಡಿಮೆ ಉಪಯುಕ್ತತೆ)	
8.	Low productivity of cows (ಹಸುಗಳ ಕಡಿಮೆ ಉತ್ಪಾದಕತೆ)	
9.	Non availability of veterinary and AI services (ಪಶುವೈದ್ಯಕೀಯ ಮತ್ತು AI ಸೇವೆಗಳ ಲಭ್ಯತೆ ಇಲ್ಲದಿರುವುದು)	