Study No. 99

Economics of Production Processing and Marketing of Fodder Crops in Madhya Pradesh

BY

Hari Om Sharma
N. K. Raghuwanshi

Agro- Economic Research Centre

for Madhya Pradesh and Chhattisgarh

JNKVV, Jabalpur

December, 2010

PREFACE

The present study entitled ***"Economics of production, processing and marketing of fodder in M.P."*** *has been assigned by the Directorate of Economics and Statistics Ministry of Agriculture Government of India to this centre along with AERCs Ludhiana(Punjab) Vallabh Vidyanaga (Gujarat) and Banglore (Karnataka) under the close coordination of Agro-Economic Research Centre, Punjab.*

The study was conducted in 3 districts viz. Rajgarh, Shajapur and Ujjain districts of Madhya Pradesh having maximum fodder area in the state. The study comprised the information which was colleted for all the districts of M.P. from the year 1990-2009 (secondary data) and the primary data colleted from 150 fodder growers by personal contact of these 3 districts.

The fodder cultivation was not shown too much progress in the state since 1990. The cultivator still growing fodder in the line of crop cultivation and the majority of them were not known the recommended package of practices of fodder cultivation. The fodder growers were also found to be not doing fodder preservation techniques viz. hay and silage making for the lean period. They were not cultivating fodder in commercial line as none of them involved in marketing of fodder in the state. Hence, it is the right time that state government re-intensified their efforts in progress of fodder in the state because without introducing dairy based faming system approach on the farmers' farm, their income should not became double, which is the ultimate target of the state government. It is only activity which not only generated income but also enhanced employment at their owned farm.

The present study was conducted by Dr. Hari Om Sharma, Principal Scientist of this Centre. He has done field investigation, tabulation, and analysis, interpretation of results and drafting of the report in stipulated time limit, besides he is also deputed as Professor In-charge (Examination) and Deputy Registrar (Examination) of the university. I wish to express my deep sense of gratitude to him and his team members namely; Shri B.S. Patel, Mr. Shrikant Upadhye, and Mr. C.K. Mishra. All the other Research Offices namely; Dr. Ashutosh Shrivastava and Dr. N. Khan and supporting staff members namely; Mr. Anil Denial and Mr. S.K. Sharma of Agro-Economic Research Centre deserved to be complemented for their untiring efforts in bringing this innovative study to its perfect shape.

I extend my heartfelt thanks to the Coordinator of this study Dr. D.K. Grower, Project Coordinator, Agro-Economic Research Centre, Ludhiana (Punjab) who has provided necessary guidelines for conducting the study.

On behalf of the Centre, I express my deep sense of gratitude to Dr. Gautam Kalloo, Hon'ble Vice-Chancellor, Dr. S.S. Tomar, Director Research Services and Dean, Faculty of Agriculture, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur for providing all facilities and help during various stages in successful completion of this study of high importance.

I express my sincere thanks to the Deputy Director Agriculture, Shajapur, Deputy Director Agriculture Ujjain, Deputy Director Agriculture Rajgarh, Deputy Director Veterinary Services Shajapur, Deputy Director Veterinary Services, Rajgarh, and Deputy Director Veterinary Services, Ujjain and their field staff for providing not only secondary data but also extending help in collection of field data from the selected respondents .

All the Scientists and supporting staff members of Department of Agricultural Economics and Farm Management, JNKVV, Jabalpur deserved to be complemented for their untiring efforts in bringing this innovative study to its perfect shape.

I would also offer my thanks to Mr. Sikandar Khan and Mr. C. K. Mishra, who took painstaking job of doing the computer typing and photocopy of the report.

I hope the findings and suggestions made in the study would be useful to policy makers of the states and Govt. of India.

Date : 30.12.2010
Place: Jabalpur

(N.K. Raghuwanshi)
Honorary Director

CONTENTS

LIST OF TABLES

.....

CHAPTER-I

INTRODUCTION

1.1 Background

Livestock production is backbone of Indian Agriculture and source of employment in rural areas for centuries. This sector has been the primary source of energy for agriculture operation and major source of animal protein for the masses. Therefore India has been house to major draught, milch and dual-purpose breeds of cattle. Our whole system of rural economy has revolved around livestock production.

However, there has been a rapid change in the way agriculture operations are carried out like;

- Agriculture production i.e. cropping system, water resources, diversification of crops, intensification of agriculture
- Increasing use of machine labour V/S bullock labour
- Transformation from sustainable farming to market oriented farming
- Changing food habits of consumers

All this has its impact on animal husbandry practices including breed character requirements of Indian farmer and thus their feeding.

India is house of 15 per cent world cattle population and 16 per cent of human population to be sustained and progressed on per cent of total geographical areas. Due to ever increasing population pressure of human, cultivable land is mainly used for food and cash crops, thus, there is little chance of having good quality cultivable land available for fodder production, and until milk production is remunerative to the farmer as compared to other crops.

There is tremendous pressure of livestock on available feed and fodder, as land available for fodder production has been decreasing. Scenario of feed and fodder availability till 2025 is given in Table 1.1

Table1.1: Supply and Demand of Feed & Fodder till 2025

(In million tones)

Year	Supply		Demand		Deficit as % of demand (actual demands)	
	Green	Dry	Green	Dry	Green	Dry
1995	379.3	421	947	526	59.95 (568)	19.95 (105)
2000	384.5	428	988	549	61.10 (604)	21.93 (121)
2005	389.9	443	1025	569	61.96 (635)	22.08 (126)
2010	395.2	451	1061	589	62.76 (666)	23.46 (138)
2015	400.6	466	1097	609	63.50 (696)	23.56 (143)
2020	405.9	473	1134	630	64.21 (728)	24.81 (157)
2025	411.3	488	1170	650	64.87 (759)	24.92 (162)

Source: Draft report of the working group on animal husbandry and dairying for five-year plan (2002-2007, Govt. of India, Planning Commission, August – 2001).

According to another estimate by National Dairy Development Board (NDDB) for an expected production of 86 million of milk by the end of 9th plan, annual requirement of green fodder will be to tune of 1064 million T and dry fodder to tune of 585 million T. The current availability, however if estimated at 570 million T and 400 million T respectively.

Table 1.2: Concentrate Deficit in India (in million tones)

Particulars	2002-03	2003-04	2004-05	2005-06	2006-07
Concentrates available	41.96	43.14	44.35	45.63	48.27
Concentrates required	117.44	120.52	123.59	127.09	130.55
Concentrate Deficit	64.27	64.21	64.12	64.10	63.03

Source: Draft report of the working group on animal husbandry and dairying for five-year plan (2002-2007, Govt. of India, Planning Commission, August – 2001).

The most common livestock feed resources are: -

1. Crop reduces (Straw, stoves, haulms etc)
2. Grass land, alpine, sub-alpine, pasture land
3. Community lands, Common property resources, wasteland
4. Cultivated fodder
5. Forest lands
6. Cut and carry grasses
7. Novel unconventional feeds, top feeds, famine feeds
8. Coarse grain
9. Oil meals
10. Cereal bran, hulls, husks
11. Agro products
12. Fish meals
13. Bone meals

Source: Draft report of the working group on animal husbandry and dairying for five-year plan (2002-2007, Govt. of India, Planning Commission, August – 2001).

It is obvious from the table 1.2 that deficit in green and dry fodder is increasing every year, while for concentrate gap almost static. But this gap is critical and is going to determine the type of animal and husbandry practices to be followed. The above requirements have been worked out on the projected livestock population (equivalent to adult cattle unit) as below: -

The projected livestock estimates when converted into adult cattle unit (ACUs) massing are of their expected age profiles are given in the Table 1.3.

Table 1.3: Projected livestock estimates (ACU)

Year	Cattle	Buffalo	Sheep	Goat	Equine	Camel	Total
1995	180.5	82.8	4.0	9.2	0.5	0.9	278.0
2000	187.1	87.7	4.1	9.9	0.4	1.0	290.0
2005	192.2	92.6	4.2	10.5	0.3	1.0	30 1.0
2010	197.3	97.5	4.3	11.2	0.3	1.0	312.0
2015	202.3	102.4	4.4	11.8	0.1	1.1	322.0
2020	207.4	107.3	4.5	12.5	0.1	1.1	333.0
2025	212.5	112.2	4.6	13.2	0.1	1.1	344.0

Source: Draft report of working group for X plan for AHCD, Planning Commission, August 2001

The estimated livestock population was converted to ACUs assuming that 350 kg of body weight =1 ACU in cattle, 450 kg=1 ACU in buffalo, 10 goats=1 ACU, 10 sheep=1 ACU.

Livestock rearing in India is changing with the requirement of time as is also evident that demand for milch breed of cattle is going up as compared to dual or draught breed. Population of indigenous breed like Haryana, Nagori, Khilar i.e. dual & draught purpose breeds has declined more than milch breeds. In this globalize / market economy dependent agri-economy, milk production has to compete for growing fodder on good or able land. Thus milch animals have to be of high productivity and reproductive efficiency.

The cultivating fodder as a cattle's' plays an important role as:

i) Feed & fodder cost constitute about 60-70 per cent of cost of milk production thus cultivated fodder has an important role in meeting requirement of various nutrients & roughage in our country to produce milk most economically as compared to concentrates

ii) It needs feed, which not only meet nutrient requirement but fills the rumen to satisfy the animal.

iii) In view of microbial digestion system, feeds have to meet requirement of cattle maintenance, production and requirement of microbes to promote digestion.

Cultivated fodder crops have a place of importance for feeding of ruminants in view of the following aspects: -

a) In view of the peculiar digestive system, provided by nature, ruminants need feeds, which not only meet their nutritional requirements but also fill the rumen and satisfy the animal.

b) In view of microbial digestion system the feeds have to meet requirements of the animal, its production as well as the needs of microbes for promoting digestion.

c) The fodder crops meet these requirements very effectively and hence are important for ruminant production system. As evident from reports that mixed with coarse roughages, like wheat straw, its intake and digestion are improved.

Fodder crops provide all the critical elements like highly digestible protein, carbohydrates, fats and minerals. Green fodders are a very good source of B-carotene (precursor of vitamin A).

i) Common cereal fodder crops like Maize, Sorghum and Oats are rich in energy and the leguminous crops like Lucerne, Berseem & Cowpea are rich in proteins.

ii) Leguminous crops, like Berseem, Lucerne & Cowpea, are a good source of major &micro minerals, so critical for rumen microbes as well as animal system

iii) Fodder cultivation has been traditional in most parts of the country since farmers feel that the fodder crops have some factor, which keeps the animal healthy and productive. And hence since generations farmers have marked out certain varieties and crops for fodder production and cultivate these, depending on availability of land and water.

The green fodder crops are known to be cheaper source of nutrients as compared to concentrates and hence useful in bringing down the cost of feeding and reduce the need for purchase of feeds/ concentrates from the market.

The stage of harvest of crop has profound effect on the nutrient contents of the fodder crop. The moisture and nutrient contents of the crop decreases and fiber content increases with maturity and hence harvesting at proper stage is crucial.

Fodder production programme should aim at selecting crops and varieties, which produce highest quantities of ' Nutrients per unit of land and time period' and hence a continuous search for improved varieties is crucial.

i) Grasses like Hybrid Napier and Guinnea grass are known for high yields and their new varieties produce good quality fodder. These grasses being perennial and high yielding are useful.

ii) Shrubs and small trees (like Gliricidia, Desmanthus, Leucaena, Sesbania spp.) are very good and cheap source of protein and minerals and can be introduced between farm plots and have multipurpose utility.

In case surplus fodder is available in some season it can be stored in form of silage or hay for lean season. Leguminous crops like Lucerne and Berseem are useful in promoting ruminal development in calves.

It has been tradition in India to have community pasture land in each village, which has been an important source of feed for cattle particularly of weaker sections like landless / small / marginal farmers. Each family has equal access to these resources in the village. In the past, group of villagers were taking care of such lands and maintaining them, but after abolition of this system, these properties became no body's property and are now in denuded condition and encroached upon by influential or sold by panchayat to mobilize resources. Various type of natural CPR is as below: -

a) <u>Land resources</u>:

i) Gochar (plot of land left vacant for livestock grazing)

ii) Banjar (degraded and wastelands, under individual or group ownership but used as resting place by livestock of the community).

iii) Gaura (plot of land where milking of milch cattle is done)

iv) Khaliyan (land where all the members of the community store their crop produce together)

v) Nistar (land reserved & left vacant for fairs, haat market, cultural ceremonies etc).

b) <u>Forest resources:</u>

1) Kakad bani (plot of land with vegetative cover specially between two village boundaries)

2) Devbani (plot of forest land left by the community in the name of god and used only in the vent of natural crisis / disaster)
3) Rakhabani (plot of forest land left by consensual decision of the community used as the last resort)
4) Devaranya (plot of forest land for god)
5) Waal (forest land owned by zamindars or temples, may be used for cultivation)
6) Beed (mostly private dense forests used by the community at the time of crisis)
7) Rundh (private dense forests which could be used by the community after paying taxes)

c) Water resources:

These include ponds, tanks, bunds, checks, wells, canals, rivers, rivulets etc. These CPR, are important for livelihood and income generation of poor people in all the states as is evident by table 1.4.

Table 1.4 : Extent of dependence of poor and wealthy households on CPRs in dry land India

(In million adult cattle)

State	Household category	CPR contributions			
		Income %	Fuel supplies %	Animal grazing %	Days of employment per household
Andhra Pradesh	Poor	17	84	0	139
	Wealthy	1	13	0	35
Gujarat	Poor	18	66	82	196
	Wealthy	0	0	0	0
Karnataka	Poor	20	0	83	185
	Wealthy	3	0	29	34
Madhya Pradesh	Poor	22	74	79	183
	Wealthy	2	32	34	52
Maharashtra	Poor	14	75	69	128
	Wealthy	1	12	27	43
Rajasthan	Poor	23	71	84	165
	Wealthy	2	23	38	61
Tamil Nadu	Poor	22	0	0	137
	Wealthy	2	0	0	31

Source: Integrated Watershed Management by Rajesh Rajora

CPRs contribute and allow considerable access to all users, but not all the sections of the rural community are equally attracted by these potentials and opportunities.

The proportion of poor households dependent on fuel, fodder and food items from CPR's ranged between 84-100 per cent in different villages. In general, the rural poor obtain the bulk of their fuel supplies and fodder from CPR's. Income from CPR's

account for 14-23 per cent of household income from all other incomes and they form an important source of income and employment, especially during the periods when other opportunities are almost non-existent. CPR's complement private farming by providing crop inputs, sustaining animals and are especially predominant in drought.

In India current land use provides 12 million ha. area under permanent pasture and grazing lands which is lying as wasteland. Out of 75 million ha. area under forest, half is lying at the last stage of degradation. Similarly, different surveys have pointed out 155 to 175 million ha as wastelands. These land resources are vital for fuel and fodder production.

Cereal and legume crop straws have been traditional source of feed for Indian livestock. These straws have not been valued much in the past but with competitive milk production, its importance as source of feed has gone up tremendously. Therefore, there has been greater emphasis and efforts to enhance nutritive value of these straws with methods of treatment like: -

- Urea treatment
- Alkaline treatment
- Ammonia treatment
- Thermal treatment (steam pressure treatment)

Though different methods of treatment have been developed but have not been taken or adopted by farmers yet.

Now there is emphasis on, treating straws with biological agents like fungi.

However, it should be clear that no toxic residues must be left by these substances, which are harmful to the ruminant and rumen microbes.

The net effect of any treatment is a result in reduction in rigidity of cell structure and swelling of cell walls, so that electrolytes and cellulslytic enzymes from rumen microbes can penetrate these cells. These microbes can then colonize the vegetal matter and decompose it more quickly because hydrolysis has already taken place.

Similarly, lot of work has been done to provide supplemental feed to not only cattle through urea / molasses block but it also enhances nutrient supply to rumen microbes. Thus, making it more efficient to digest forage.

Most common supplements consist of:

i) Urea strategic ingredient
ii) Molasses
iii) Mineral
iv) Fibrous feed
v) Cementing material

If all the treatments are given with recommended dosages, rumen microbes have been found to be efficient to convert these feed into nutrients without any residual effect on cattle rumen microbes and milk.

1.2 Need for the Study

Madhya Pradesh is basically an agricultural state and about 70 per cent of its people live in villages. Their livelihood is dependent mainly on agriculture and animal husbandry. Though state has a huge livestock population of over 4162.96 millions, besides poultry, yet the production of milk and other livestock products is about the lowest in India. In the state, the people are highly deficient in various cattle products, though we have about one-fourth of the total cattle population of India. As against the minimum nutritional requirement of 201 g/head/day of milk set by the nutritionists, 100 g/head/day is the availability per head. One of the main reasons for the low productivity of livestock is malnutrition, under-nutrition or both, besides the low genetic potential of the animals. In fact, the economic viability of livestock husbandry depends on sources of feed and fodder as feeding cost constitutes about 65 - 70 per cent of the total cost of livestock farming. The feed given to cattle comprises dry fodder, green fodder and concentrates of which dry fodder forms the major share. The adequate supply of feed and fodder is a critical factor affecting performance of animals. This fact is adequately supported by the figures of availability, *vis-a-vis* the requirement of green-fodder crops, crop residues and concentrates, which shows that there is a huge gap of between demand and supply of all kinds of these feeds and fodders, in the state.

Fodder crops may be classified as temporary or as permanent crops; the former are cultivated and harvested like any other crop, the latter relate to land used permanently (five years or more) for herbaceous forage crops, either cultivated or growing wild (wild prairie or grazing land). They may include some areas of forest lands that are used for grazing. Temporary crops grow in artificial meadows which are normally used very intensively, with various cuttings per year. They contain three major groups of fodder: grasses, including cereals harvested green; legumes, including pulses harvested green;

and root crops that are cultivated for fodder. Through processing, the fodder can be fed to animals as green feed; as hay, i.e. crops harvested dry or left to dry if harvested green; or as silage products. Though, Silage or ensilage is a method of preservation of green fodder through fermentation to retard spoiling and this method of processing is more popular in India as compared to hay making But ,it M.P. the hay and silage making method of preservation of fodder are not been found in practices by the cultivators.

On the other hand, if we examine the land resources available for growing fodder and forage crops, it is estimated that the average cultivated area devoted to fodder production is only 4.4 per cent of the total area in India, and it was found to be only 3 per cent in M.P. Similarly, the area under permanent pastures and cultivable wastelands is approximately 13 and 15 million hectares respectively but it was found to be only 4.42 and 3.37 per cent of net area sown (150.74 lac ha) Likewise, the total area under forests is 2.51 crore hectares and that open to grazing is 2.1 crore hectares. All these resources are able to meet the forage requirements of the grazing animals only during the monsoon season. But for the remaining periods of the year, the animals have to be maintained on the crop residues or straws of *jowar*, *bajra*, *ragi*, wheat, barley, etc. either in the form of whole straw or a *bhusa*, supplemented with some green fodder, or as sole feed. The crop residues are available mainly from wheat, paddy, *bajra*, *jowar*, *soybean*, sugarcane trash, etc., which are poor in nutritive value. Cultivation of hybrid varieties of wheat and paddy to enhance grain production has changed the grain-foliage ratio more favorable to humans, thus affecting the production and availability of straw. Besides this, the decrease in paddy cultivation due to drought and water shortage has also affected the availability of straw. The green fodder resources for livestock are mainly derived from grazing in grasslands and pastures, fodder crops from cropped lands, weeds, bund grasses, tree leaves and mixed forages. The sustainability of dairy industry in India largely depends upon the quality of herbage based animal feed and fodder. Green fodder is the essential component of feeding high yielding milch animals to obtain desired level of milk production. The technology of growing year round fodder production has helped the farmers/dairy owners to sustain their milch animals of 6-7 liters per day potential with minimum use of concentrates, thus producing milk at cheaper cost.

The cost production of milk increased day by day and in the production cost of milk, 60 percent cost was incurred of the green fodder, If the cost of production of green fodder decreases it also decreases the cost of milk production Hence, looking to the

above points in consideration present study is formulated to examine the costs and returns analysis for various fodder crops will be helpful to examine the relative profitability of these crops in the region. The farmers will get the remunerative prices for their surplus produce only when the effective and efficient processing and marketing system is in place.

1.3 Objectives of the study

The study will be carried out to accomplish the following objectives:

1. To study the status of fodder crops cultivated in the state;
2. To estimate the costs of production and returns associated with the cultivation of important fodder crops.
3. To examine the present processing and marketing system of fodder crops and to estimate costs and returns at each link for these fodder crops.
4. To identify the processing and marketing system of fodder crops and to estimate costs and returns across different channels of fodder crops.
5. To study the problems faced by the producers in production of these fodder crops and remedial measures thereof.

1.4 Limitation of the Study:

1. As none of the fodder grower was found to be done processing of fodder viz. hay and silage making for the lean period. They were not also found to be cultivated fodder at commentarial line and not yet involved in the marketing of fodder. Hence, the aspects related to processing and marketing of fodder have not been covered in this study.
2. The time series data related to the productivity and production of fodder were not been available to the investigators. As in Madhya Pradesh the yield & production data of any crop were estimated by the crop cutting experiments. As there is no provision of crop cutting experiments for the fodder crops hence, due to unavailability of the data the aspects related to the productivity and production of fodder crops were not also dealt in the study.
3. The all the primary data which were colleted from the respondents are based on their memory as they are not keeping any farms record on their farms.

.....

CHAPTER –II

METHODOLOGY

This chapter deals with the sampling techniques used, nature and type of data required, tools of data collection, methods of classification, tabulation and analysis of collected data and concepts used while interpretation of data analyzed the data for interpretations.

2.1 Sampling Techniques:

Amongst different districts (50), 3 districts i.e. Rajgarh (8.93%), Shajapur (8.51%), and Ujjain (6.69%) has been selected purposively (Table 2.1) for the study on the basis of highest area in fodder cultivation in M.P. (569987 ha).Amongst the selected districts, two blocks from each district, one block near and one distant to the periphery of district headquarter has been selected randomly to realize the effect of distance factor in the findings. From each block, a cluster of 3 villages has been randomly chosen. Finally, a sample of 25 farmers was selected randomly from each selected cluster, spreading over various farm size categories i.e., Marginal (less than one hectare), small (1-2 hectares), semi-medium (2-4 hectares), medium (4-10 hectares) and large (more than 10 hectares) based on the size of the operational holding, making a total sample of 150 farmers. (Table 2.2) The primary data collections were done by the personal interview method for the reference year 2008-09.

Table 2.1 : Area of Fodder in different Districts of M.P.

S. No.	Districts	2004-05	2005-06	2006-07	In Average	**Percentage to Total**
1	Jabalpur	795	737	767	766	**0.14**
2	Katni	28	26	16	23	**0.00**
3	Balaghat	24	67	50	47	**0.00**
4	Chhindwara	134	172	524	277	**0.02**
5	Seoni	1809	1547	1684	1680	**0.31**
6	Mandla	0	0	0	0	**0.00**
7	Dindori	0	0	0	0	**0.00**
8	Narsighpur	2051	1819	1686	1852	**0.35**
9	Sagor	26734	26685	24966	26128	**4.59**
10	Damoh	2959	2797	2549	2768	**0.51**
11	Panna	0	0	0	0	**0.00**
12	Tikamgarh	22979	19290	18173	20147	**3.95**
13	Chhtarp[ur	18575	14590	13097	15421	**3.19**
14	Rewa	59	68	80	69	**0.01**
15	Sidhi	0	0	0	0	**0.00**
16	Satna	49	48	42	46	**0.01**
17	Shadol	10	0	0	3	**0.00**
18	Anuppur	0	0	0	0	**0.00**
19	Umaria	1	1	0	1	**0.00**
20	Indore	22950	39886	27245	30027	**3.94**
21	Dhar	19698	18154	18057	18636	**3.38**
22	Jhabua	13222	12503	12027	12584	**2.27**
23	Kargoan	7248	6932	6528	6903	**1.25**
24	Badwani	1726	1456	1818	1667	**0.30**
25	Khandwa	3826	3340	3243	3470	**0.66**
26	Burhanpur	27	28	29	28	**0.00**
27	**Ujjain**	**38959**	**38313**	**34886**	**37386**	**6.69**
28	Mandsour	32814	31123	30879	31605	**5.64**
29	Neemuch	23280	21670	21314	22088	**4.00**
30	Rastlam	35881	33788	33227	34299	**6.17**
31	Dewas	30339	29116	27578	29011	**5.21**
32	**Shajapur**	**49514**	**47548**	**47974**	**48345**	**8.51**
33	Morena	3639	3559	3472	3557	**0.63**
34	Sheopur	1634	2175	2409	2073	**0.28**
35	Bhind	4132	6305	3037	4491	**0.71**
36	Gwalior	5187	4942	4430	4853	**0.89**
37	Shivpuri	32019	30902	27352	30091	**5.50**
38	Gunna	23431	23079	22467	22992	**4.03**
39	Ashoknagar	10164	10094	9349	9869	**1.75**
40	Datia	2318	2455	1625	2133	**0.40**
41	Bhopal	9357	9214	8345	8972	**1.61**
42	Sehore	38259	38978	37789	38342	**6.57**
43	Raisen	13159	13599	13011	13256	**2.26**
44	Vidhisha	10098	9603	9057	9586	**1.74**
45	Betul	5833	17690	8035	10519	**1.00**
46	**Rajgarh**	**51952**	**50865**	**50273**	**51030**	**8.93**
47	Hoshangabad	6940	6329	5674	6314	**1.19**
48	Harda	8166	7004	4720	6630	**1.40**
	Not reported	0	0		0	**0.00**
	Total	581979	588497	539484	569987	**100.00**

Table 2: Selected Locations and Respondents of the Study

Name of the Districts	Name of the Blocks	Name of the Villages	No. of Farmers Selected
1.Rajgarh	1 Sarangpur	1. Baiwara mandu	25
		2. Saidabagh	
		3 Kalukheda	
	2 Narsinghgarh	1. Pipaleheda	25
		2. Kachrodh	
		3 Polipar	
2.Shajapur	1 Shajapur	1. Alaamrodh	25
		2. Mulikheda	
		3 Gudaravan	
	2 Agar	1. Hadaie	25
		2. Bharodh	
		3 Badgoan	
3.Ujjain	1 Tarana	1. Junapani	25
		2. Pardwa	
		3. Guthlae	
	2 Mahidpur	1. Munjakhedi	25
		2. Guradiyadasa	
		3 Ajmabad	
Total	**6**	**18**	**150**

III. Coverage of the crops

The study will be conducted in the Madhya Pradesh states of India and includes; berseem, maize, and jowar chari respectively in the kharif, rabi and summer seasons, which were selected for the in depth analysis. As these fodder crops has been recognized by the majority of fodder growers of the state in the respective seasons.

2.2 Nature & Sources of Data:

The study was based on both primary and secondary data. The primary data of the study were collected from the selected respondents of different locations of the study. The required secondary data were collected on the different aspects of the study from the all the institutions (Department of Farmers Welfare and Agricultural Development, Vindhyachal Bhawan , Bhopal ,M.P; Department of Animal Husbandry , Kamdhenu Bhawan, Bhopal, M.P.; Department of Agril. Statistics, Government of M.P.) from their published and unpublished records. The secondary data were also collected from different Internet websites.

2.3 Tools of Data Collection:

The primary data were collected from an interview schedule, which was provided by the coordinator of the project for collection of required data from the respondents. (Appendix 1) This interview schedule having all the information about the sample farmer viz.; land utilization pattern, cropping pattern, farm assets and expected constraints related to crop production, processing and marketing of fodder . The primary data were collected from the individual sample respondents using this interview schedule through survey method by personal contact. The primary data pertained to the agricultural year 2008-2009 and being collected in the month of April and Sept 2010

2.4 Classification, Tabulation and Analysis of Data:

The primary data were classified and tabulated in light of stated objectives of the study. The SPSS (Statistical Package for Social Science) was used for classification, analysis and tabulation of collected data. The collected data were analyzed with compare means, regression analysis etc.

2.5 Concepts Used:

The different concepts related to production of fodder cultivation were used and are as follows:

(i) Total Variable cost: It includes labour cost and input cost per hectare

(ii) Labour cost: The per hectare expenses on human labour (family & hired) , bullock labour and machine hours were considered in labour cost.

(iii) Input cost: The per hectare expenses on material cost i.e. seed, seed treatment, micro nutrients, bio-fertilizers, fertilizer & manures, insecticides, pesticides fungicide were considered as input cost.

(iv) Gross Income: Yield of fodder X Average rate prevailing rate of fodder

(viii) Net farm income at total variable Cost: Gross income – Total variable Cost

.....

CHAPTER –III

STATUS OF LIVESTOCK POPULATION AND FODDER CROPS CULTIVATED IN MADHYA PRADESH

Madhya Pradesh, in its present form, came into existence on November 1, 2000 following its bifurcation to create a new state of Chhattisgarh. The undivided Madhya Pradesh was founded on November 1, 1956.Madhya Pradesh, because of its central location in India, has remained a crucible of historical currents from North, South, East and West.

Madhya Pradesh is situated in the heart of India between latitudes 21^0 -53' to 22^0 53' North and longitude 77^0 47' to 78 ^{0} 44' East. It is the second largest state after Rajasthan of Indian Union with a total geographical area of 307.56 thousand square Kilometers. In terms of population (6,0348023) it occupies 5^{th} position in India (2001). It has 10 -commissionaire division (Chambal, Gwalior, Bhopal, Ujjain, Indore, Sagar, Rewa, Jabalpur Hoshangabad and Shahdol) divided into 50 districts, 272 tehsil, 313 block & 370 towns and 76,468 villages. (Table 3.01) It is abundantly rich in minerals and bio resources. With 27 per cent of land area under forests, it supports a wide variety of animal and plant life. The state has a rich history, culture and crafts.

Table 3.01: Location of Madhya Pradesh

S. No.	Particulars	
1	Number of Tehsils	272
2	Number of Blocks	313
3	Number of Villages	55393
4	Latitude	21° 53` to22° 59`N
5	Longitude	76°47` to 78°44` E
6	Height from see means level	50-1200
7	No of districts	50
8	No. of Gram panchayat	22029
9	No. of electrified Villages	50474
10	Percentage of electrified villages to total Villages	100

The Physiography of the state exhibits a great deal of diversity with areas ranging from less than 50 meter above mean sea level to more than 1200 meter. The state falls under the catchments of Jamuna, Ganga, Narmada, Mahanadi and Godavari. On the basis

of broad land features, the state could be classified in 5 physiographic regions and 11 agro-climatic zones (Table 3.02)

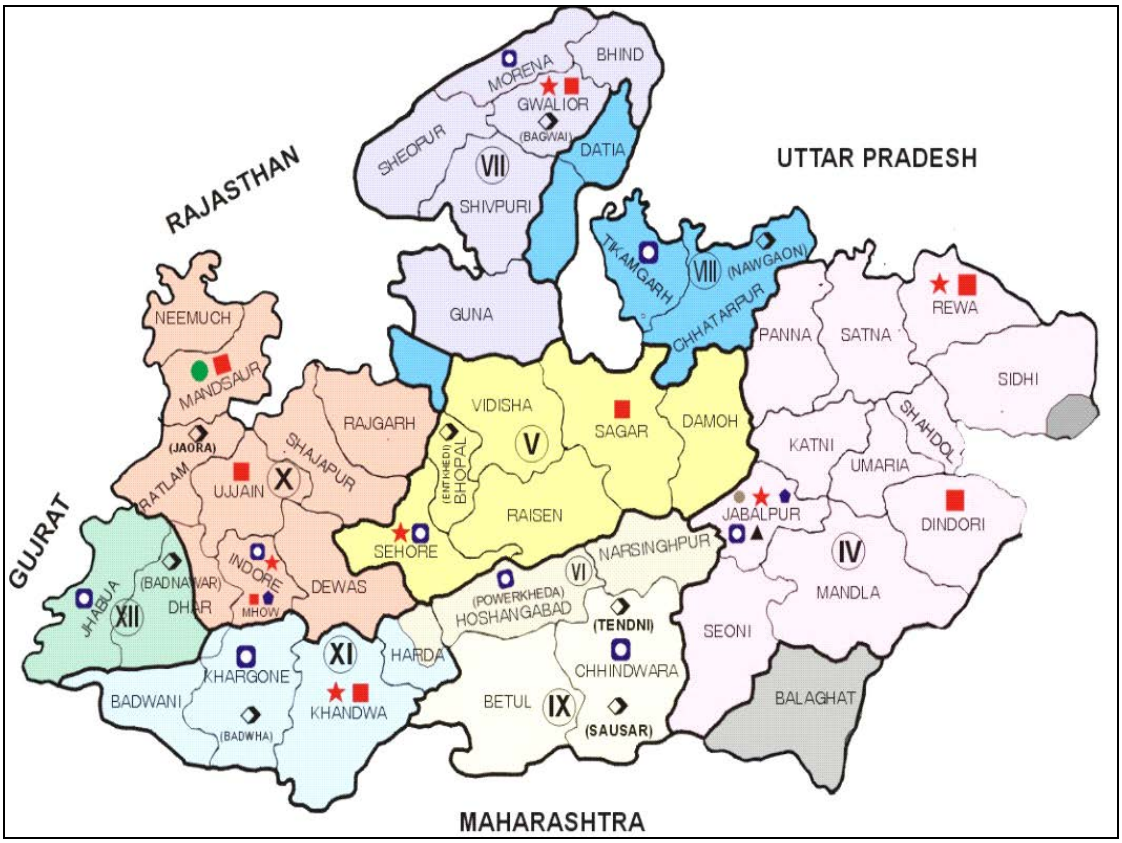
1. Northern low lying plains comprising Gwalior, Bhind and Morena districts and extend to Bundelkhand up to the west of Panna range and excludes certain parts of Rewa district between Panna and Kaymore hills of Baghelkhand.

2. The Malwa and Vindhyan Plateau comprises of Vidisha, Shivpuri, Datia, Guna, Morena, Ujjain and Mandsour districts and parts of Sehore, Raisen and Dewas districts. It consists of large undulating plains of black cotton soil dotted with flat-topped hills. It has also hilly Vindhyan Plateau situated it the north of Narmada Valley and to the south of the low-lying regions of Bundelkhand and Baghelkhand. It spared from east of Malwa plateau to Maikal and Dorea hills Satpura range

3. The Narmada Valley stretching from Jabalpur in the east up to Barwani district in the west. It is nearly 560 Km long and 48 Km wide and is walled on the north by the Vindhyan range and on the south by Satpura range. It covers the districts of Jabalpur, Nasinghpur, Hoshangabad, Khandwa, Khargone, Barwani, Dhar, and some parts of Raisen, Sehore, and Dewas districts.

4. The Satpura range runs from west to east for about 640 Km through Khandwa, Betul, Chhindwara, Seoni, Mandla, Bilaspur and Sarguja districts. Its northern spurs go into Hoshangabad and Nasinghpur districts and in the south an extensive spur of 160 Km covers entire Balaghat districts.

5. Madhya Pradesh also covers Balaghat and Shahdol district of Chhatisgarh Plains and Northern Hills of Chhatisgarh zone respectively.



AGROCLIMATIC ZONES

- I. CHHATTISGARH PLAINS
- IV. KYMORE PLATEAU AND SATPURA HILLS
- V. VINDHYAN PLATEAU
- VI. CENTRAL NARMADA VALLEY
- VII. GIRD ZONE
- VIII. BUNDELKHAND ZONE
- IX. SATPURA PLATEAU
- X. MALWA PLATEAU
- XI. NIMAR VALLEY
- XII. JHABUA HILLS

Fig. 3.1: Agro-Climatic Zones of Madhya Pradesh

Table-3.02: Agro-Climatic Regions and covered Districts /Tehsils in Madhya Pradesh

(Area in Lakh ha)

Agro-Climatic Regions	Districts/Tehsils	Geogra-phical Area	Percent to Geographical Area
1.Malwa Plateau	Indore, Dhar, (Dhar, Badnawar, Sardarpur tehsils) Shajapur, Mandsour, Nimuch, Ratlam, Ujjain, Dewas Rajgarh districts and Petlawad tehsil of Jhabua district	51.47	16.74
2.Vindhyan Plateau	Bhopal, Vidisha, Sehore (Sehore, Ashta, Ichhawar, Narsullaganj tehsils) Raisen (Raisen, Gairatganj, Begamganj, Silwani, Goharganj, Udaipura tehsils), Damoh, Guna (Chachora & Raghogarh tehsils) & Sagar districts	42.59	13.85
3.Central Narmada Valley	Hoshangabad (Seoni-Malwa, Hoshangabad, Sohagpur tehsils), Harda, Nasinghpur districts, Budhani and Barelli tehsil of Sehore and Raisen districts respectively	17.45	5.67
4.Satpura Plateau	Betul, Chhindwara districts	21.93	7.13
5.Jhabua Hills	Jhabua, Jobat, Alirajpur tehsils of Jhabua district & kukshi tehsil of Dhar district	6.88	2.24
6.Gird Region	Gwalior, Bhind, Morena, Shivpur-Kalan, Guna (Mungawali and Ashoknagar tehsils), Shivpuri (Shivpuri, Kalaras, Pohari tehsils)	31.85	10.36
7. Kymore Plateau	Jabalpur, Katni, Rewa, Panna, Satana, Sidhi, Seoni and Gopadbana & Deosar tehsils of Sidhi district.	49.97	16.25
8.Bundel Khand Region	Tikamgarh, Chhatarpur, Datia districts, Karela, Pachore tehsil of Shivpuri and Guna tehsil of Guna district	22.82	7.42
9.Nimar Valley	Khandwa, Khargone, Barwani district, Manawar tehsil of Dhar district and Harda district	25.17	8.18
10.Northern Hills of Chhattisgarh	Shahdol, Umariya Mandla, Dindori district & Singrauli tehsil of Sidhi district	28.17	9.16
11.Chhattisgarh plain	Balaghat district	9.25	3.00
Madhya Pradesh		307.55	100.00

The main soil types found in Madhya Pradesh are alluvial, deep black, medium black shallow black, mixed red and black, mixed red and yellow and skeletal soils. (Table 3.03)

Table 3.03: Soil types and districts covered in Madhya Pradesh.

Types of Soil	Districts covered
Alluvial Soil	Bhind, Morena and Gwalior
Deep Black Soil	Hoshangabad and Narsinghpur
Medium Black Soil	Jabalpur, Sagar, Vidisha, Sehore, Damoh, Guna, Bhopal, Raisen, Rajgarh, Indore, Dewas, Ujjain, Mandsour, Shajapur, Ratlam, Dhar, Khargone and Khandwa
Shallow Black Soil	Betul, Chhindwara and Seoni
Red & Black Soil	Shivpuri, Rewa, Satna, Panna, Sidhi, Chhattarpur, Tikamgarh, Datia and some parts of Guna district.
Red & Yellow Soil	Balaghat.
Gravelly Soil	Mandla.

The climate of Madhya Pradesh by virtue of its location is predominately moist sub humid to dry sub humid, semi arid to dry sub-humid and semi arid in east, west and central plateau and hills respectively, according to agro-climatic regions of India. The seasons in Madhya Pradesh are as given below:

Table 3.04: Seasons and their periods in Madhya Pradesh

Seasons	Period	
	From	**To**
Rainy	June	September
Post Monsoon	October	November
Winter	December	February
Summer	March	May

The annual rainfall received in the state varies from 800 mm. in the northern and western regions to 1600 mm in the eastern districts. In some years rainfall goes much below to the normal. Most of rainfall is received in the Monsoon season from June to September and about 10 per cent of the rainfall is received in the remaining part of the year.

The maximum temperature during extreme summer reaches as high as 47^0C and the minimum during winter dips up to 5^0C. The maximum normal temperature varies between 25 and 35^0C and minimum normal between 10^0 to 20^0C.The relative humidity ranges from 40 to 70 per cent throughout the year.

According to 2001 census the population of the state was 60348023 comprises of 52.10 per cent of male and 47.90 per cent female. Over 1000 male there were only 927 females. State had a rural background as the 73.54 per cent of total population lives in villages and rest 26.46 per cent in urban areas. The percentage of literacy was found only 64.11 per cent with male female ratio of 1:1. Madhya Pradesh comes under tribal area 20.27 per cent of total population were belongs to scheduled tribes. The percentage or workers were 42.68 per cent of total population, while 57.16 per cent of total population belongs to non worker category. 31.16 per cent population classified order main worker category, while, only 18.32 per cent were falls in farmers.

Table 3.05: Population parameters of Madhya Pradesh (Census 2001)

S. No.	Particulars	Population	Percentage to total
1	Total Population	60348023	100
A	Male	31443852	52.10
B	Female	28904371	47.90
2	Sex ratio	927	
3	Rural Population	44380878	73.54
4	Urban Population	15967145	26.46
5	Population of Schedule Caste	9155177	15.17
6	Population of Schedule Tribes	12233474	20.27
7	Number of Literate persons	38689103	64.11
8	Number of Farmers	11058500	18.32
9	Agriculture Labour	7380878	12.23
10	Home Industry	1010067	1.67
11	Other Workers	6307040	10.45
12	Total Main Workers	19077568	31.61
13	Marginal Workers	6678917	11.07
14	Total Workers	25756485	42.68
15	Non Workers	34496254	57.16

The total geographical area of the State is 307.56 lakh ha. in which 49.01 per cent land was found to be under cultivation (**Table 3.06)** and 11.02 per cent land not available for cultivation. The 4.42 per cent of total land was classified under culturable waste land, while 3.38 per cent of total is in fallow land. The cropping intensity of the state was found to be 130.76 per cent.

Table 3.06: Land use Classification of Madhya Pradesh 2005-06

S.No.	Particulars	Area (Lakh ha)	Percentage to Geographical Area
1	Geographical Area	307.56	100
2	Forest	85.89	27.93
3	Area not available for cultivation	33.89	11.02
4	Other non agricultural land (excluding fallow land)	13.58	4.42
5	Culturable Waste lands	11.61	3.77
6	Fallow land	11.85	3.85
7	Net area sown	150.74	49.01
8	Double cropped Area	46.37	
9	Gross Area sown	197.11	
10	**Cropping Intensity (%)**	**130.76**	

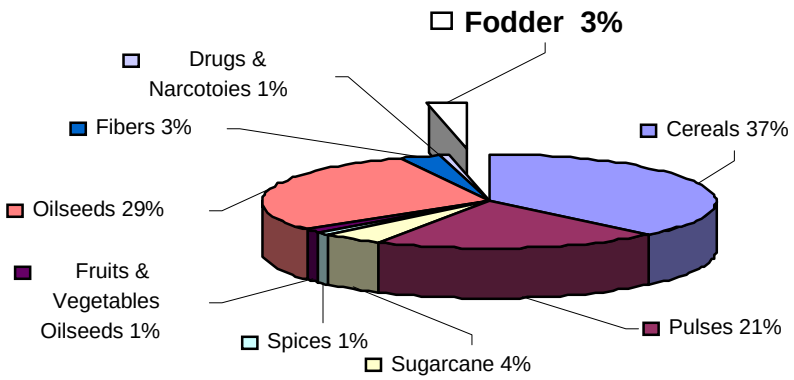
Wells (39.93%), tube-wells (25.42%), canals (18.31%) and tanks (2.35%) are found the major sources of irrigation in M.P. The state had 5681 thousand ha. area under irrigation. (**Table 3.07**)

Table 3.07 Irrigation Status of Madhya Pradesh

S. No.	Source	Net Irrigated Area	Percentage to total	Gross Irrigated Area	Percentage to total
1	Canal	1030	18.13	1076	18.31
2	Tanks	134	2.36	138	2.35
3	Tube-well	1449	25.51	1494	25.42
4	Well	2246	39.54	2347	39.93
5	Others	822	14.46	823	14.00
6	Total	5681	100.00	5878	100.00

Madhya Pradesh have rich diversity and occupied nearly all the cereals (37%), pulses (21 %), oilseeds (29%) fibers (3%), fruits and vegetables (1%), spices(1%), sugarcane (4%) and Fodder (3%) in its total food and non food basket (i.e. 19,710 thousand ha.) (**Fig. 3.2**)

Fig 3.2: Share of Fodder in Gross Cropped Area (21.05 lakh ha) in M.P.



The wheat, paddy, jowar, maize are found the main cereals (7555 thousand ha.) crops of the state. The chickpea, tur , lentil, peas, are the main pulse crop of the state. Madhya Pradesh known for soybean production, about 55 per cent of total area of the country exists in the state. Apart from soybean, sesamum, linseed, groundnut, mustard and rape seed are the other oilseeds grown by the majority cultivators in the state.

3.1 livestock population

The livestock populating in Madhya Pradesh showed increasing trend over the years. The total livestock population found to be increased by 1.90 per cent in the year 2007 as compare to the year 1992 (32400.06 thousand) with the annual growth of 1.90 per cent (Table 3.1.1). As regards to the population of different livestock is concerned the population of cattle, buffalo and goat found to be increased with growth of 0.56 per cent, 7.07 per cent 3.58 per cent per annum, while the population of horse and pony (-4.09%), donkey (-4.18%), sheep (-2.65%), camel (-4.20%) and mule (-6.16%) showed negative growth rates over the years. Among the different livestock, the population of buffalo (7.07%) showed maximum annual growth rates followed by goat (3.58%) and cattle (0.56%).

Table 3.1.1: Number of Livestock 1992-2007

(Thousands)

Particulars	1992	1997	2002	2007	AAGR (%)
Cattle	20207.04	19496.87	19512.61	21915.44	0.56
Buffalo	4430.60	6648.26	7575.31	9129.15	7.07
Horse & Pony	84.85	75.14	41.79	32.76	-4.09
Donkey	70.65	63.51	46.75	26.31	-4.18
Sheep	760.67	788.02	689.40	458.54	-2.65
Goat	6384.69	6472.05	8143.99	9810.70	3.58
Camel	18.33	16.44	13.83	6.79	-4.20
Pig	434.62	486.63	470.60	249.14	-2.85
Mule	8.60	7.12	4.64	0.65	-6.16
Total Live stock	32400.06	34054.03	36498.90	41629.46	1.90

3.1.1 Cattle Population

The number of cattle found to be increased over the period of time with an annual growth rate of 0.56 per cent in Madhya Pradesh. Amongst the different districts of Madhya Pradesh the district Shahdol (2.50 %), Mandla (2.30 %), Damoh (2.13 %), Rajgarh (2.01 %), Satna (1.93 %), Sidhi (1.88 %), Sagar (1.69 %), Jhabua (1.54 %), Rewa (1.37 %), Tikamgarh (1.06 %), Khargone (1.03 %), Panna (0.73 %), and Narsinghpur (0.65%) showed positive growth rates over the year 1992, while Bhind (-2.71%), Gwalior (-2.22%), Chhatarpur (-1.53%), Morena (-1.06%),Indore (-0.47%), Hoshangabad (-0.46%), Mandsaur (-0.17%), Balaghat (-0.13%), and Vidisha (-0.05%) showed negative annual growth rates. The highest population of cattle found to be annually increased in Shahdol (2.50 %) district followed by Mandla (2.30%), Damoh (2.13%), Rajgarh (2.01%), Satna (1.93%), Sidhi (1.88%), Sagar (1.69%), Jhabua (1.54%) and Rewa (1.37%) districts. The highest cattle population found to be annually decreased in Bhind (-2.71%), Gwalior (-2.22%), Chhatarpur (-1.53%) and Morena (-1.06%) districts .The districts namely; Tikamgarh (1.06%), Khargone (1.03%), Panna (0.73%), and Narsinghpur (0.65%) showed more annual growth as compared to Madhya Pradesh (0.56%), while other districts of Madhya Pradesh showed less growth as compared to Madhya Pradesh.

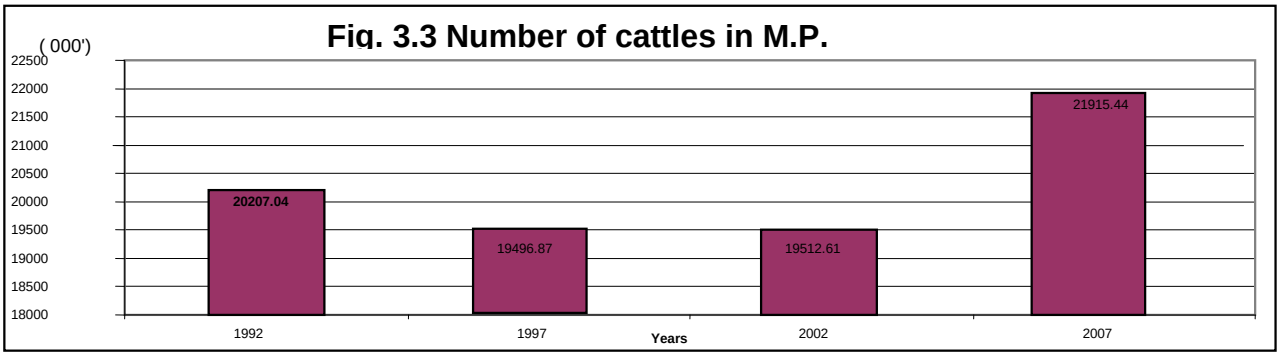


Table 3.1.2: District-wise Number of Cattle in M.P. (1992-2007)

(Thousands)

S. No.	Districts	1992	1997	2002	2007	AAGR (%)
1	Jabalpur (+ Katni)	894.42	1094.41	687.67	922.03	0.21
2	Balaghat	581.51	574.35	541.46	570.60	-0.13
3	Chhindwara	724.43	761.54	720.79	778.36	0.50
4	Seoni	498.96	513.47	427.46	539.77	0.55
5	Mandla +Dindori	708.92	721.69	734.58	953.77	2.30
6	Narsinghpur	341.30	325.95	403.56	374.48	0.65
7	Sagor	702.65	675.93	601.10	880.30	1.69
8	Damoh	448.21	478.92	515.89	591.15	2.13
9	Panna	493.58	463.16	545.60	547.59	0.73
10	Tikamgarh	517.58	449.55	443.15	600.14	1.06
11	Chhatarpur	736.13	652.24	504.96	567.26	-1.53
12	Rewa	800.79	793.33	704.86	965.59	1.37
13	Sidhi	856.84	822.26	970.73	1098.22	1.88
14	Satna	769.31	711.28	715.44	991.77	1.93
15	Shahdol (+Anuppur+ Umaria)	968.62	904.72	945.16	1131.71	2.50
16	Indore	236.14	213.47	199.68	219.46	-0.47
17	Dhar	549.92	543.44	739.29	584.15	0.41
18	Jhabua	569.16	620.60	629.97	700.92	1.54
19	Kargoan (+ Badwani)	805.61	834.13	1227.53	929.69	1.03
20	Khandwa (+ Burhanpur)	513.59	521.51	460.39	546.95	0.43
21	Ujjain	360.15	336.58	359.69	373.93	0.26
22	Mandsour (+ Neemuch)	575.18	521.23	521.31	560.88	-0.17
23	Ratlam	305.33	277.03	280.68	306.76	0.03
24	Dewas	400.45	369.38	385.82	404.05	0.06
25	Shajapur	412.48	382.33	388.76	417.00	0.07
26	Morena (+ Sheopur)	534.28	524.17	335.87	449.36	-1.06
27	Bhind	257.38	213.77	153.05	152.87	-2.71
28	Gwalior	325.04	255.69	198.85	216.74	-2.22
29	Shivpuri	669.61	602.38	518.27	695.18	0.25
30	Gunna (+ Ashoknagar)	597.56	542.03	542.48	642.33	0.50
31	Datia	137.35	120.61	139.67	142.28	0.24
32	Bhopal	144.93	110.98	134.74	149.74	0.22
33	Sehore	385.31	367.10	349.27	399.82	0.25
34	Raisen	423.84	375.95	393.70	437.82	0.22
35	Vidisha	405.99	364.45	644.91	403.19	-0.05
36	Betul	593.79	525.44	569.48	620.58	0.30
37	Rajgarh	416.14	415.59	351.61	541.58	2.01
38	Hosangabad (+ Harda)	544.60	516.20	525.21	507.42	-0.46
Madhya Pradesh		20207.04	19496.87	19512.61	21915.44	0.56

3.1.2 Buffalo population

The population of Buffalo showed increasing trend over the years in Madhya Pradesh (Fig.3.4). All the districts of Madhya Pradesh showed positive average annual growth rates during the period under study. The highest average annual growth rate of buffalo was found to be in Jhabua district (26.45 %) followed Rajgarh (23.55 %), Datia (23.10 %), Bhopal (16.08 %), Shivpuri (15.61 %), Betul (13.42 %), Guna (12.67 %), Morena (12.65 %), Raisen (10.64 %), Vidisha (10.50 %), Hoshangabad (10.39 %), Dhar (10.28 %), Dewas (10.07 %), Ujjain (9.79%), Shajapur (9.43%), Mandsaur (9.36%), Gwalior (8.56%), Khandwa (7.82%), and Ratlam (7.37%) districts (Table 3.1.3). The other districts are showed less annual growth as compared to Madhya Pradesh (7.07%).

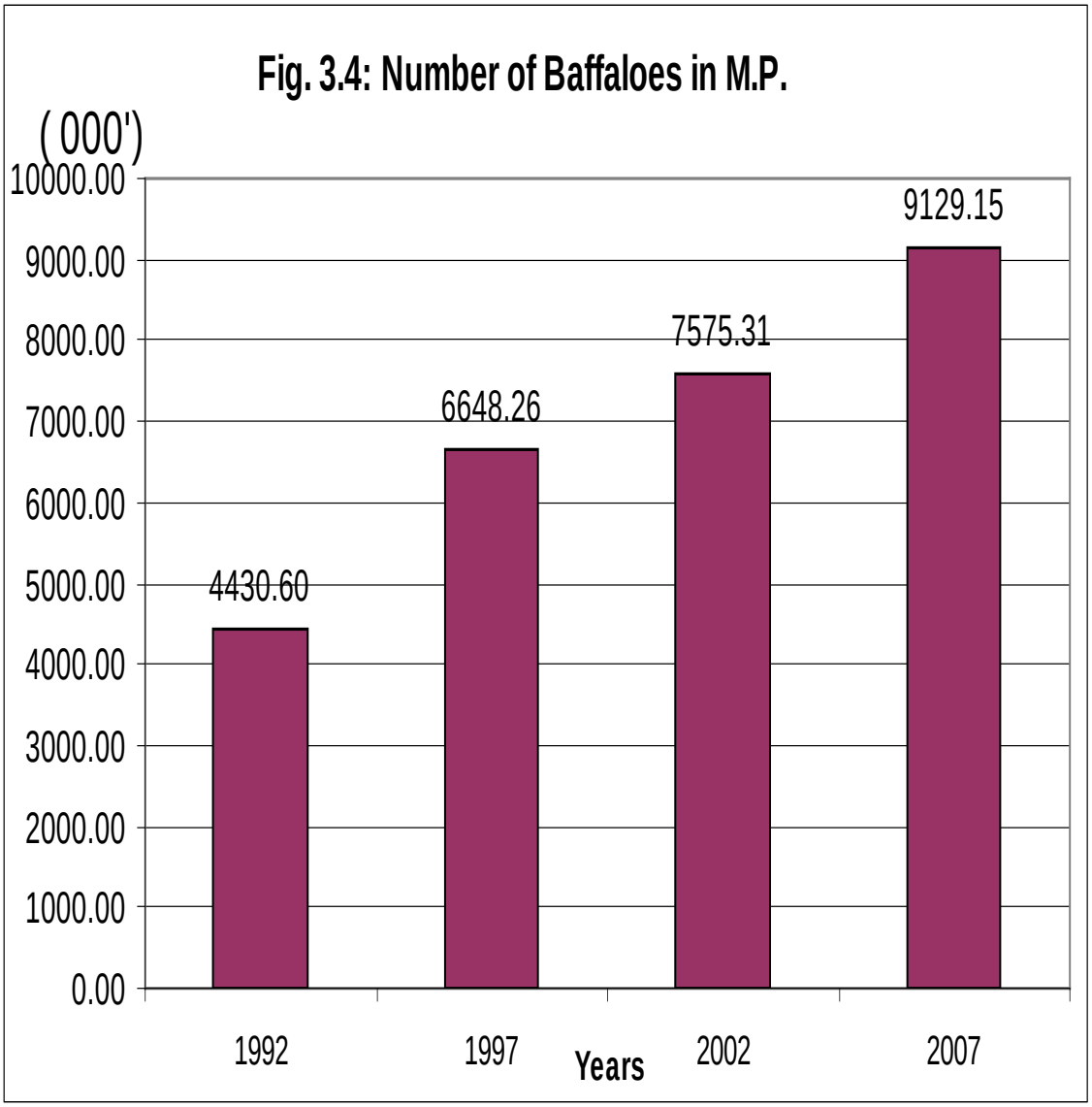


Table 3.1.3: District-wise Number of Buffaloes in M.P. (1992-2007)

(Thousands)

S. No.	Districts	1992	1997	2003	2007	AAGR (%)
1	Jabalpur (+ Katni)	186.294	208.911	165.953	200.385	0.50
2	Balaghat	134.841	135.566	139.843	153.723	0.93
3	Chhindwara	123.098	137.611	139.918	168.501	2.46
4	Seoni	102.379	114.801	125.752	123.654	1.39
5	Mandla +Dindori	145.162	156.423	118.218	147.318	0.10
6	Narsinghpur	88.993	100.136	118.31	132.531	3.26
7	Sagor	154.138	155.323	134.938	242.933	3.84
8	Damoh	83.256	97.151	101.217	130.882	3.81
9	Panna	123.833	120.315	196.296	164.138	2.17
10	Tikamgarh	139.226	143.485	181.903	312.419	8.29
11	Chhatarpur	211.44	218.747	250.609	343.667	4.17
12	Rewa	154.487	140.382	152.862	232.962	3.39
13	Sidhi	165.765	170.807	194.035	240.412	3.00
14	Satna	157.192	153.844	161.022	229.23	3.06
15	Shahdol (+Anuppur+ Umaria)	217.311	230.548	203.982	231.614	0.44
16	Indore	116.337	186.013	162.663	220.981	6.00
17	Dhar	93.482	193.604	401.167	237.685	10.28
18	Jhabua	52.661	119.571	124.029	261.601	26.45
19	Kargoan (+ Badwani)	132.344	269.393	193.954	319.441	9.42
20	Khandwa (+ Burhanpur)	77.635	148.15	141.153	168.683	7.82
21	Ujjain	133.431	236.875	227.731	329.4	9.79
22	Mandsour (+ Neemuch)	145.559	298.57	302.03	349.921	9.36
23	Ratlam	77.915	148.84	275.41	163.992	7.37
24	Dewas	97.63	177.339	151.937	245.099	10.07
25	Shajapur	115.295	201.076	235.225	278.372	9.43
26	Morena (+ Sheopur)	200.038	442.694	480.369	579.688	12.65
27	Bhind	146.529	289.628	335.604	313.99	7.62
28	Gwalior	110.502	197.779	226.765	252.305	8.56
29	Shivpuri	112.765	203.951	245.12	376.805	15.61
30	Gunna (+ Ashoknagar)	111.47	206.211	243.885	323.258	12.67
31	Datia	41.959	86.821	142.467	187.329	23.10
32	Bhopal	32.446	77.16	86.5	110.693	16.08
33	Sehore	71.077	142.216	184.463	127.288	5.27
34	Raisen	52.335	100.926	175.483	135.829	10.64
35	Vidisha	66.31	121.551	287.469	170.793	10.50
36	Betul	57.079	115.476	150.158	172.018	13.42
37	Rajgarh	122.566	239.77	228.999	555.576	23.55
38	Hosangabad (+ Harda)	75.824	160.591	187.866	194.036	10.39
Madhya Pradesh		4430.604	6648.255	7575.305	9129.152	7.07

3.1.3 Goat Population

The number of goats was found to be increased in all the districts of Madhya Pradesh except Indore. The highest and maximum average annual growth of goat population was found to be in Mandla district (47.19 %) followed by Datia (7.48 %), Tikamgarh (7.34%), Bhopal (5.63 %), Jhabua (4.76 %), Balaghat (4.71 %), Ujjain (4.52 %), Ratlam (4.17 %), Khandwa (4.13%) Chhattarpur (4.08%),

Raisen (4.05%), and Bhind (3.70%) districts The other districts are showed less annual growth as compared to Madhya Pradesh (3.58%).

Table 3.1.4: District-wise Number of Goats in M.P. (1992-2007)

(Thousands)

S. No.	Districts	1992	1997	2003	2007	AAGR (%)
1	Jabalpur (+ Katni)	194.81	176.06	207.46	207.97	0.45
2	Balaghat	160.18	180.12	240.24	273.23	4.71
3	Chhindwara	244.59	250.65	306.73	355.93	3.03
4	Seoni	116.03	129.99	158.34	170.74	3.14
5	Mandla +Dindori	119.35	134.94	160.23	964.19	47.19
6	Narsinghpur	68.94	70.03	96.91	77.91	0.87
7	Sagor	107.84	111.92	106.79	139.51	1.96
8	Damoh	87.86	110.94	100.15	94.43	0.50
9	Panna	112.13	108.66	201.76	145.16	1.96
10	Tikamgarh	185.98	170.20	282.01	390.84	7.34
11	Chhatarpur	257.21	283.00	336.08	414.57	4.08
12	Rewa	178.95	166.34	164.48	191.06	0.45
13	Sidhi	317.89	336.75	475.00	453.34	2.84
14	Satna	180.42	179.88	186.83	227.27	1.73
15	Shahdol (+Anuppur+ Umaria)	183.78	200.31	212.78	236.17	1.90
16	Indore	94.83	85.38	101.21	90.76	-0.29
17	Dhar	312.97	321.48	373.64	405.56	1.97
18	Jhabua	301.41	354.54	488.29	516.74	4.76
19	Kargoan (+ Badwani)	415.97	422.03	458.27	625.17	3.35
20	Khandwa (+ Burhanpur)	166.37	168.07	171.46	269.42	4.13
21	Ujjain	131.80	141.09	189.42	221.08	4.52
22	Mandsour (+ Neemuch)	259.12	234.37	375.27	309.24	1.29
23	Ratlam	131.93	178.12	203.08	214.36	4.17
24	Dewas	122.08	133.74	149.43	138.24	0.88
25	Shajapur	145.94	142.17	193.08	178.87	1.50
26	Morena (+ Sheopur)	288.83	270.08	301.62	337.53	1.12
27	Bhind	141.00	137.28	180.94	219.29	3.70
28	Gwalior	241.94	152.57	155.54	324.06	2.26
29	Shivpuri	251.40	235.39	396.75	365.65	3.03
30	Gunna (+ Ashoknagar)	164.95	145.08	200.06	246.05	3.28
31	Datia	73.44	67.34	113.06	155.86	7.48
32	Bhopal	49.62	50.39	56.30	91.49	5.63
33	Sehore	77.60	76.59	87.62	80.51	0.25
34	Raisen	66.20	73.19	77.34	106.38	4.05
35	Vidisha	76.91	79.29	155.12	78.28	0.12
36	Betul	122.17	158.46	183.86	175.77	2.92
37	Rajgarh	124.68	118.03	164.58	189.91	3.49
38	Hosangabad (+ Harda)	107.59	117.63	132.30	128.18	1.28
Madhya Pradesh		6384.69	6472.05	8143.99	9810.70	3.58

3.1.4 Donkey Population

The population of donkey was found to be showed decreasing trend (Fig.3.5) and it was found to be decreased in all the districts of Madhya Pradesh except Mandla, Shahdol, Datia, Panna, and Chhatarpur over the period of time (1992 to 2007). The

maximum negative annual growth rate of donkey population was found in Sehore (-5.93%) district followed by Jabalpur (-5.50 %), Shajapur(-5.43 %), Indore (-5.24%), Dewas (-5.13%), Raisen (-4.98 %), Rajgarh (-4.88 %), Vidisha (-4.86%), Bhopal (-4.67%), Mandsaur(-4.47%), Jhabua (-4.38),Tikamgarh (-4.35%) and Guna (-4.21%) districts. In the other districts of M.P. the annual growth of donkey population was found to be less than the annual growth of Madhya Pradesh (-4.18%).

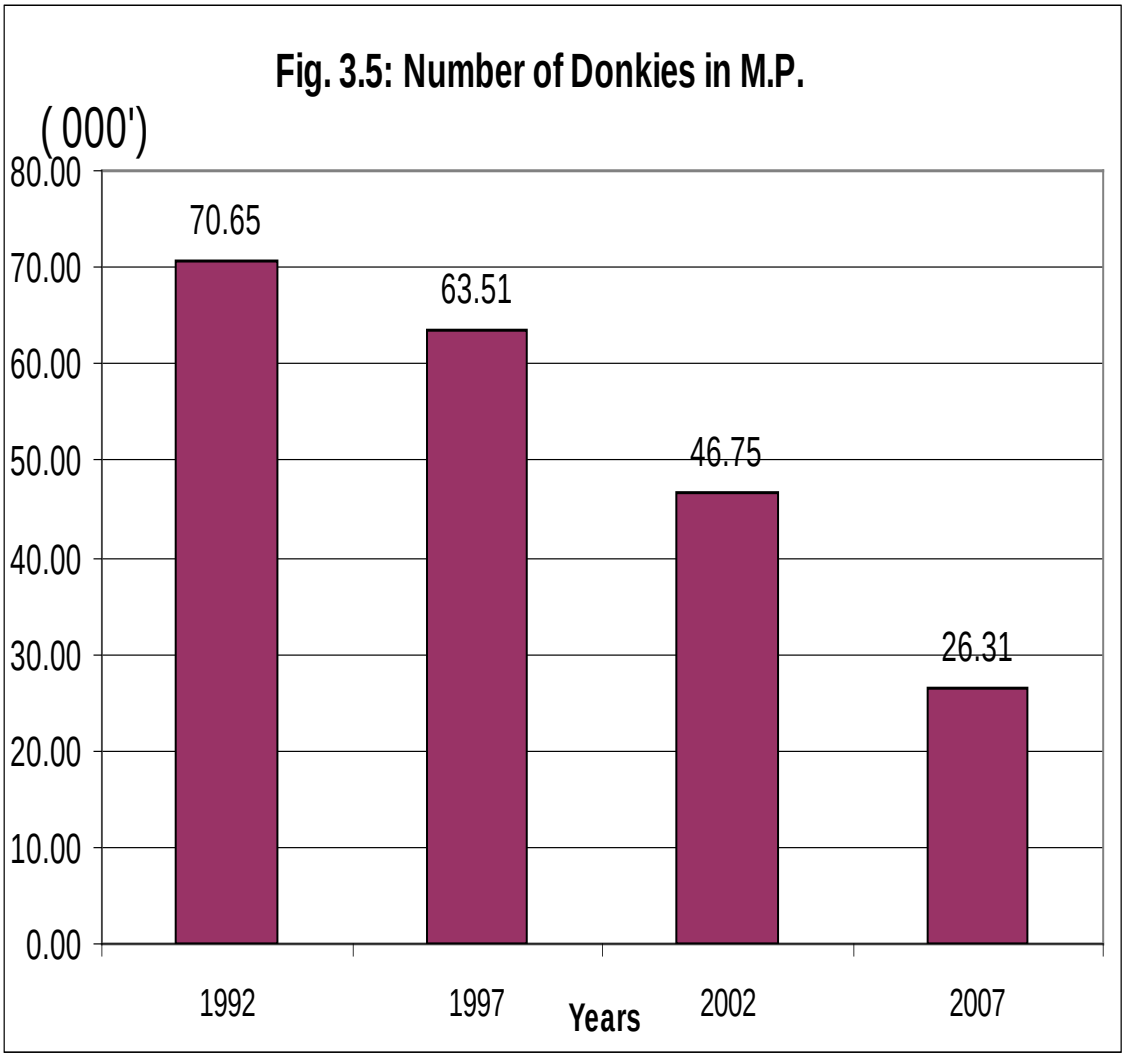


Table 3.1.5: District-wise Number of Donkies in M.P. (1992-2007)

(Thousands)

S. No.	Districts	1992	1997	2003	2007	AAGR (%)
1	Jabalpur (+ Katni)	0.285	0.059	0.38	0.05	-5.50
2	Balaghat	0	0	0	0	0.00
3	Chhindwara	0.827	0.701	0.402	0.51	-2.56
4	Seoni	0.101	0.075	0.082	0.083	-1.19
5	Mandla +Dindori	0.001	0.806	0.241	0.072	473.33
6	Narsinghpur	1.215	0.89	0.681	0.685	-2.91
7	Sagor	0.433	0.289	0.14	0.222	-3.25
8	Damoh	0.675	0.604	0.785	0.261	-4.09
9	Panna	0.3	0.888	0.888	0.372	1.60
10	Tikamgarh	0.704	0.882	0.829	0.245	-4.35
11	Chhatarpur	1.18	1.618	1.153	1.492	1.76
12	Rewa	0.093	0.403	0.088	0.073	-1.43
13	Sidhi	0.066	0.03	0.03	0.029	-3.74
14	Satna	0.387	0.108	0.22	0.174	-3.67
15	Shahdol (+Anuppur+ Umaria)	0.006	0.303	0.094	0.069	70.00
16	Indore	1.223	1.053	0.619	0.261	-5.24
17	Dhar	3.088	2.388	2.687	0.833	-4.87
18	Jhabua	2.464	2.11	2.167	0.845	-4.38
19	Kargoan (+ Badwani)	4.804	4.17	2.549	2.26	-3.53
20	Khandwa (+ Burhanpur)	1.961	2.066	1.183	0.788	3.99
21	Ujjain	3.077	2.669	1.712	0.673	-5.21
22	Mandsour (+ Neemuch)	3.269	2.804	2.302	1.075	-4.47
23	Ratlam	1.907	1.494	1.06	0.409	-5.24
24	Dewas	1.382	1.023	0.783	0.319	-5.13
25	Shajapur	3.453	2.88	1.75	0.64	-5.43
26	Morena (+ Sheopur)	2.952	2.331	1.465	1.575	-3.11
27	Bhind	1.015	0.894	0.715	0.18	-5.48
28	Gwalior	7.058	1.7	0.791	1.575	-5.18
29	Shivpuri	1.368	1.101	0.555	0.565	-3.91
30	Guna (+ Ashoknagar)	1.952	3.211	0.979	0.718	-4.21
31	Datia	0.368	0.32	0.449	0.491	2.23
32	Bhopal	0.575	0.795	0.294	0.172	-4.67
33	Sehore	1.381	1.311	0.819	0.153	-5.93
34	Raisen	1.149	1.15	1.091	0.29	-4.98
35	Vidisha	1.486	1.245	6.452	0.403	-4.86
36	Betul	0.906	0.934	0.448	0.347	-4.11
37	Rajgarh	3.742	2.708	1.888	1.001	-4.88
38	Hosangabad (+ Harda)	0.918	1.276	0.543	0.433	-3.52
	Madhya Pradesh	70.65	63.511	46.748	26.308	-4.18

3.1.5 Sheep Population

The population of sheep also shows decreasing trend over the period of time in all the districts of Madhya Pradesh (Table 3.1.6) except Jhabua, Betul, Rajgarh. The annual growth of sheep population was found to be increased in Rajgarh (7.43%), Jhabua (1.86%), and Betul (0.16%) districts. The population of sheep was found to be decreased with an annual growth rate (-2.65%) during the period of time in Madhya Pradesh. The maximum decreased annual growth of sheep over the time were found to be in

Balaghat (-6.25 %) district followed by Dewas (-5.77%), Sagar (-5.75%), Raisen (-5.72 %), Dhar (-5.15 %), Indore (-5.13%), Vidisha (-5.06%), Chhindwara (-5.02%), Narsinghpur (-4.94%), Jabalpur (-4.93%), Bhind (-4.53%), Ratlam (-4.42%), Guna (-3.81%), Chhattarpur (-3.75%), Gwalior (-3.54%), Mandsaur (-3.53%), Seoni (-3.31%), Ujjain (-3.16 %), Khargone (3.06 %), Panna (-2.92 %), Bhopal (-2.90 %), and Mandla (-2.82%) districts. (Table 3.1.6)

Table 3.1.6: District-wise Number of Sheep in M.P. (1992-2007)

(Thousand)

S. No.	Districts	1992	1997	2003	2007	AAGR (%)
1	Jabalpur (+ Katni)	15.602	14.707	4.703	4.073	-4.93
2	Balaghat	0.032	1.114	0.013	0.002	-6.25
3	Chhindwara	2.388	1.738	0.822	0.59	-5.02
4	Seoni	0.352	0.169	0.393	0.177	-3.31
5	Mandla +Dindori	1.247	1.41	1.001	0.719	-2.82
6	Narsinghpur	1.265	1.189	0.241	0.328	-4.94
7	Sagor	4.915	4.653	1.747	0.673	-5.75
8	Damoh	5.814	5.565	7.166	5.504	-0.36
9	Panna	10.886	11.03	7.16	6.125	-2.92
10	Tikamgarh	71.166	58.927	4.237	55.832	-1.44
11	Chhatarpur	52.65	53.259	23.782	23.042	-3.75
12	Rewa	22.631	25.467	18.48	16.769	-1.73
13	Sidhi	25.665	28.696	18.153	19.686	-1.55
14	Satna	24.411	25.423	14.615	15.112	-2.54
15	Shahdol (+Anuppur+ Umaria)	11.27	15.338	10.576	8.735	-1.50
16	Indore	2.721	1.853	3.545	0.627	-5.13
17	Dhar	14.076	19.655	6.793	3.21	-5.13
18	Jhabua	7.994	11.124	14.694	10.223	1.86
19	Kargoan (+ Badwani)	14.721	11.502	130.029	7.972	-3.06
20	Khandwa (+ Burhanpur)	28.255	28.904	17.713	18.184	-2.38
21	Ujjain	10.123	7.48	10.596	5.326	-3.16
22	Mandsour (+ Neemuch)	47.415	39.027	28.624	22.322	-3.53
23	Ratlam	17.033	16.567	0.882	5.739	-4.42
24	Dewas	0.104	0.074	0.099	0.014	-5.77
25	Shajapur	5.225	3.352	19.89	0.912	-5.50
26	Morena (+ Sheopur)	32.369	44.064	23.213	24.567	-1.61
27	Bhind	42.743	44.35	21.595	13.674	-4.53
28	Gwalior	63.066	48.814	22.531	29.613	-3.54
29	Shivpuri	75.215	74.396	23.561	64.576	-0.94
30	Gunna (+ Ashoknagar)	9.504	14.819	4.642	4.066	-3.81
31	Datia	14.902	16.57	14.656	12.547	-1.05
32	Bhopal	0.544	0.654	0.237	0.307	-2.90
33	Sehore	1.611	1.568	0.263	1.756	-0.60
34	Raisen	2.468	1.721	7.536	0.351	-5.72
35	Vidisha	1.939	3.787	12.187	0.466	-5.06
36	Betul	3.473	5.672	3.07	3.556	0.16
37	Rajgarh	1.008	11.551	17.767	2.132	7.43
38	Hosangabad (+ Harda)	0.449	0.542	0.154	0.356	-1.38
	Madhya Pradesh	760.669	788.017	689.397	458.535	-2.65

3.1.6 Horse and Pony Population

There was observed drastic reduction in the population of horse and pony over the period of time in all the district of Madhya Pradesh except in Sehore (32.09 %/year) district. The population of horse and pony were found to be decreased with an average annual growth of (- 4.09 %/year) over the time in state. The maximum reduction in the population of horse & pony was found to be in Sidhi (-6.54 %/year) district followed by Gwalior (-6.16% /year), Rewa (-6.13%/year), Shajapur (-6.02 %/year), Jabalpur (-5.94 %/year) and Raisen (-5.91%/year) districts during the period under study. (Table 3.1.7)

Table 3.1.7: District-wise Number of Horses& Ponies in M.P. (1992-2007)

(Thousands)

S. NO.	Districts	1992	1997	2003	2007	AAGR (%)
1	Jabalpur (+ Katni)	2.20	1.61	0.51	0.24	-5.94
2	Balghat	0.20	0.15	0.17	0.10	-3.33
3	Chhindwara	5.13	4.83	2.16	1.49	-4.73
4	Seoni	1.54	1.41	0.49	0.23	-5.67
5	Mandla (+ Dindori)	7.44	7.40	3.08	2.23	-4.67
6	Narsighpur	1.72	1.47	1.07	0.15	-6.09
7	Sagor	1.62	1.45	0.62	0.34	-5.27
8	Damoh	0.70	0.74	0.91	0.10	-5.71
9	Panna	0.80	0.71	1.11	0.36	-3.67
10	Tikamgarh	0.50	0.32	0.52	0.25	-3.33
11	Chhtarpur	0.58	0.60	0.66	0.45	-1.49
12	Rewa	0.74	1.05	0.08	0.06	-6.13
13	Sidhi	1.59	1.23	0.25	0.03	-6.54
14	Satna	0.56	0.48	0.30	0.19	-4.40
15	Shahdol (+ Anuppur+ Umaria)	3.44	3.42	1.61	0.96	-4.81
16	Indore	1.13	0.85	0.45	0.48	-3.83
17	Dhar	1.05	0.93	0.46	0.16	-5.65
18	Jhabua	0.42	0.30	0.19	0.10	-5.08
19	Khargoan (+ Badwani)	1.02	0.89	0.36	0.49	-3.46
20	Khandawa (+ Burhanpur)	1.84	1.63	1.38	0.91	-3.37
21	Ujjain	1.43	1.27	1.03	0.38	-4.90
22	Mandsour (+ Neemuch)	2.45	1.89	1.60	0.98	-4.00
23	Ratlam	1.33	1.29	0.56	0.37	-4.81
24	Dewas	0.93	0.75	0.32	0.16	-5.52
25	Shajapur	1.86	1.37	0.72	0.18	-6.02
26	Morena (+ Sheopur)	0.85	0.67	0.70	0.44	-3.22
27	Bhind	0.80	0.84	0.48	0.16	-5.33
28	Gwalior	4.60	3.28	0.75	0.35	-6.16
29	Shivpuri	0.44	0.30	0.24	0.13	-4.70
30	Guna (+ Ashok nagar)	1.08	1.26	0.29	0.37	-4.38
31	Datia	0.19	0.16	0.26	0.10	-3.16
32	Bhopal	0.80	0.83	0.28	0.11	-5.75
33	Sehore	1.87	1.10	0.43	10.87	32.09
34	Raisen	2.63	2.02	1.92	0.30	-5.91
35	Vidisha	1.30	1.10	2.35	0.30	-5.13
36	Betul	2.35	2.65	1.56	0.34	-5.70
37	Rajgarh	1.23	0.77	1.01	0.15	-5.85
38	Hosangabad (+ Harda)	2.08	1.70	0.72	0.57	-4.84
Madhya Pradesh		84.85	75.14	41.79	32.76	-4.09

3.1.7 Pig Population

The population of pig also showed decreasing trend over the period time with an annual growth rate of (-2.85 %) in Madhya Pradesh. The population of pig was found to be decreased in all the districts of Madhya Pradesh except in Hoshangabad, Datia, and Chhatarpur. The population of pigs decreased more in Jhabua (-5.95% /year) district followed by Dhar (-5.76 % /year), Indore (-5.56% /year), Damoh (-5.44% / year), Narsinghpur (-5.27 % /year), Shajapur (-5.08 % /year), Gwalior (-4.45 % /year), Seoni (-4.24%/year), Mandsaur (-4.21 % /year), Dewas (-4.02 % /year), Betul (-3.96 % /year), Balaghat (-3.85 % /year), Vidisha (-3.59 %/year), Guna (3.56 %/year), Chhindwara (-3.38 % /year), Raisen (-3.27 %/ year), Sehore (3.22 % / year), Sagar (-3.20% /year), Shahdol (-3.19 %/year), Rewa (-3.09 %/year) and Khandwa (-3.07 %/year) districts as compare to Madhya Pradesh. In the remaining districts the annual growth of population of pig found to be less than the annual growth of the state over the time period.

Table 3.1.8: District-wise Number of Pigs in M.P. (1992-2007)

(Thousand)

S. No.	Districts	1992	1997	2003	2007	AAGR (%)
1	Jabalpur (+ Katni)	24.25	24.27	22.94	16.33	-2.18
2	Balaghat	21.23	22.43	14.75	8.96	-3.85
3	Chhindwara	6.88	6.75	5.33	3.39	-3.88
4	Seoni	8.58	8.33	3.94	3.12	-4.24
5	Mandla +Dindori	22.97	33.41	34.26	13.54	-2.74
6	Narsinghpur	5.81	5.57	5.14	1.22	-5.27
7	Sagor	7.00	9.65	5.94	3.64	-3.20
8	Damoh	8.00	9.04	8.26	1.47	-5.44
9	Panna	7.29	7.99	23.28	5.50	-1.64
10	Tikamgarh	8.09	6.66	7.47	5.75	-1.93
11	Chhatarpur	18.39	21.55	19.16	19.11	0.26
12	Rewa	21.37	25.02	15.89	11.48	-3.09
13	Sidhi	9.82	12.05	12.30	8.37	-0.98
14	Satna	13.79	13.57	16.14	11.11	-1.30
15	Shahdol (+Anuppur+ Umaria)	10.75	14.51	12.73	5.60	-3.19
16	Indore	14.43	18.76	8.10	2.39	-5.56
17	Dhar	3.31	3.07	3.25	0.45	-5.76
18	Jhabua	0.28	0.34	0.73	0.03	-5.95
19	Kargoan (+ Badwani)	5.25	5.27	4.50	3.37	-2.39
20	Khandwa (+ Burhanpur)	3.15	4.40	4.94	1.70	-3.07
21	Ujjain	1.94	2.66	3.79	1.30	-2.20
22	Mandsour (+ Neemuch)	5.23	5.57	6.28	1.93	-4.21
23	Ratlam	2.43	2.08	2.50	1.48	-2.61
24	Dewas	2.90	5.24	4.67	1.15	-4.02
25	Shajapur	4.84	5.23	4.88	1.15	-5.08
26	Morena (+ Sheopur)	10.36	9.78	12.69	8.32	-1.31
27	Bhind	10.41	10.80	13.36	6.37	-2.59
28	Gwalior	33.57	16.81	6.68	11.17	-4.45
29	Shivpuri	8.15	8.81	10.76	6.74	-1.15
30	Gunna (+ Ashoknagar)	5.95	9.94	9.40	2.77	-3.56
31	Datia	3.58	4.66	3.56	4.48	1.68
32	Bhopal	5.63	6.18	7.85	3.98	-1.95
33	Sehore	3.44	4.31	2.16	1.78	-3.22
34	Raisen	2.83	3.71	2.70	1.44	-3.27
35	Vidisha	2.93	3.33	10.91	1.35	-3.59
36	Betul	8.44	13.19	8.37	3.43	-3.96
37	Rajgarh	5.68	5.60	13.72	4.55	-1.33
38	Hosangabad (+ Harda)	3.89	4.47	4.76	2.85	1.78
Madhya Pradesh		434.62	486.63	470.60	249.14	2.85

3.1.8 Camel Population

The population of camel was also found to be decreased over the period of time in Madhya Pradesh with an annual growth rate of (-4.20 %). (Table 3.1.9) In the district Chhatarpur (22.22 %), Ujjain (4.00%), Dewas (3.33%), Panna (0.53%), Damoh (0.47%), Sagar (0.40%), Narsinghpur (0.33%), Mandla (0.27%), Seoni (0.20%), Chhindwara(0.13%) and Balaghat (0.07%) the population of camel was found to be increased over the period of time, while in Tikamgarh, Rewa, Dhar, Sidhi, Satna , Jhabua, Khargone, Khandwa, Ratlam, Shajapur, Morena, Bhind, Shivpuri, Guna, Datia, Bhopal, Raisen, Vidisha, Rajgarh and Hoshangabad districts it was found to be decreased during the period under study.

Table 3.1.9 District-wise Number of Camels in M.P. (1992-2007)

(Thousands)

S. No.	Districts	1992	1997	2003	2007	AAGR (%)
1	Jabalpur (+ Katni)	0.00	0.00	0.00	0.00	0.00
2	Balaghat	0.00	0.01	0.00	0.00	0.07
3	Chhindwara	0.00	0.00	0.00	0.00	0.13
4	Seoni	0.00	0.00	0.00	0.00	0.20
5	Mandla +Dindori	0.00	0.00	0.12	0.00	0.27
6	Narsinghpur	0.00	0.00	0.00	0.00	0.33
7	Sagor	0.00	0.00	0.10	0.00	0.40
8	Damoh	0.00	0.00	0.00	0.00	0.47
9	Panna	0.00	0.00	0.00	0.00	0.53
10	Tikamgarh	0.15	0.03	0.01	0.00	-6.67
11	Chhatarpur	0.03	0.03	0.01	0.13	22.22
12	Rewa	0.19	0.20	0.08	0.05	-4.91
13	Sidhi	0.10	0.12	0.03	0.00	-6.67
14	Satna	0.00	0.00	0.00	0.00	0.00
15	Shahdol (+Anuppur+ Umaria)	0.00	0.00	0.00	0.00	0.00
16	Indore	0.01	0.03	0.19	0.01	0.00
17	Dhar	0.04	0.34	0.08	0.00	-6.67
18	Jhabua	0.01	0.00	0.03	0.00	-6.67
19	Kargoan (+ Badwani)	0.02	0.01	1.86	0.00	-6.67
20	Khandwa (+ Burhanpur)	0.00	0.03	0.01	0.00	0.00
21	Ujjain	0.05	0.09	0.24	0.08	4.00
22	Mandsour (+ Neemuch)	3.63	5.08	3.20	1.79	-3.38
23	Ratlam	0.03	0.04	0.29	0.01	-4.44
24	Dewas	0.02	0.00	0.05	0.03	3.33
25	Shajapur	0.34	0.46	0.22	0.02	-6.27
26	Morena (+ Sheopur)	2.14	1.21	0.42	0.53	-5.02
27	Bhind	1.83	1.34	0.55	0.29	-5.61
28	Gwalior	2.23	0.42	0.53	1.34	-2.66
29	Shivpuri	0.21	0.30	0.03	0.04	-5.40
30	Gunna (+ Ashoknagar)	0.09	0.06	0.03	0.00	-6.67
31	Datia	0.04	0.02	0.04	0.01	-5.00
32	Bhopal	0.01	0.01	0.03	0.00	-6.67
33	Sehore	0.00	0.01	0.00	0.02	0.00
34	Raisen	1.05	0.01	0.00	0.00	-6.67
35	Vidisha	0.01	0.00	0.00	0.00	-6.67
36	Betul	0.00	0.00	0.00	0.05	0.00
37	Rajgarh	0.19	0.16	0.05	0.03	-5.61
38	Hosangabad (+ Harda)	0.03	0.01	0.01	0.00	-6.67
Madhya Pradesh		18.33	16.44	13.83	6.79	-4.20

3.1.9 Mule Population

There was found drastic decreased in the population of mule over the time period in Madhya Pradesh with an annual growth rate of -6.16 per cent per year. The population of mule was found to be annually decreased over the time all the districts of M.P. during the period under study.

Table 3.10: District-wise Number of Mules in M.P. (1992-2007)

(Thousands)

S. No.	Districts	1992	1997	2003	2007	AAGR (%)
1	Jabalpur (+ Katni)	0.13	0.06	0.02	0.00	-6.67
2	Balaghat	0.00	0.00	0.00	0.00	0.00
3	Chhindwara	0.00	0.00	0.05	0.00	0.00
4	Seoni	0.02	0.00	0.01	0.00	-6.67
5	Mandla +Dindori	0.00	0.00	0.11	0.03	0.00
6	Narsinghpur	0.07	0.05	0.07	0.01	-5.71
7	Sagor	0.05	0.11	0.02	0.00	-6.67
8	Damoh	0.10	0.02	0.09	0.00	-6.67
9	Panna	0.22	0.66	0.52	0.00	-6.67
10	Tikamgarh	0.17	0.39	0.06	0.06	-4.31
11	Chhatarpur	1.21	1.32	0.95	0.15	-5.84
12	Rewa	0.03	0.21	0.06	0.03	0.00
13	Sidhi	0.00	0.00	0.01	0.00	0.00
14	Satna	0.11	0.50	0.04	0.05	-3.64
15	Shahdol (+Anuppur+ Umaria)	0.01	0.05	0.04	0.01	0.00
16	Indore	0.03	0.01	0.00	0.03	0.00
17	Dhar	0.01	0.01	0.01	0.00	-6.67
18	Jhabua	0.00	0.00	0.22	0.00	0.00
19	Kargoan (+ Badwani)	0.00	0.01	0.10	0.01	0.00
20	Khandwa (+ Burhanpur)	0.00	0.00	0.01	0.00	0.00
21	Ujjain	0.07	0.06	0.07	0.04	-2.86
22	Mandsour (+ Neemuch)	0.03	0.07	0.25	0.01	-4.44
23	Ratlam	0.02	0.03	0.00	0.00	-6.67
24	Dewas	0.00	0.00	0.02	0.00	0.00
25	Shajapur	0.08	0.05	0.00	0.00	-6.67
26	Morena (+ Sheopur)	0.42	0.34	0.15	0.06	-5.71
27	Bhind	0.17	0.22	0.11	0.00	-6.67
28	Gwalior	4.06	1.39	0.49	0.00	-6.67
29	Shivpuri	0.21	0.11	0.04	0.00	-6.67
30	Gunna (+ Ashoknagar)	0.03	0.13	0.03	0.00	-6.67
31	Datia	0.10	0.36	0.03	0.01	-6.00
32	Bhopal	0.01	0.02	0.03	0.00	-6.67
33	Sehore	0.12	0.12	0.01	0.02	-5.56
34	Raisen	0.07	0.00	0.01	0.00	-6.67
35	Vidisha	0.08	0.07	0.22	0.00	-6.67
36	Betul	0.00	0.01	0.02	0.01	0.00
37	Rajgarh	0.15	0.16	0.31	0.00	-6.67
38	Hosangabad (+ Harda)	0.11	0.01	0.00	0.00	-6.17
Madhya Pradesh		8.60	7.12	4.64	0.65	-6.16

3.1.10 Total livestock

The total population of livestock found to be increased over the period of time in all the district of Madhya Pradesh. The maximum annual growth rate of population of total livestock was found to be in Rajgarh (6.12%) , followed by Datia (5.67%), Bhopal (3.47 %), Tikamgarh (3.19 %), Ujjain (3.01%), Khargone (2.46 %), Sidhi (2.14%), Morena (2.05%) , Damoh (1.99%), Sagar (1.97%), Ratlam (1.92 %), and Satna (1.91%) districts of Madhya Pradesh. In other districts of M.P. the growth of total

livestock was also found to be increased over the period of time but these annual growth was found to be less than the Madhya Pradesh. (Table 3.1.11)

Table 3.1.11: District-wise Number of Live Stocks in M.P. (1992-2007)

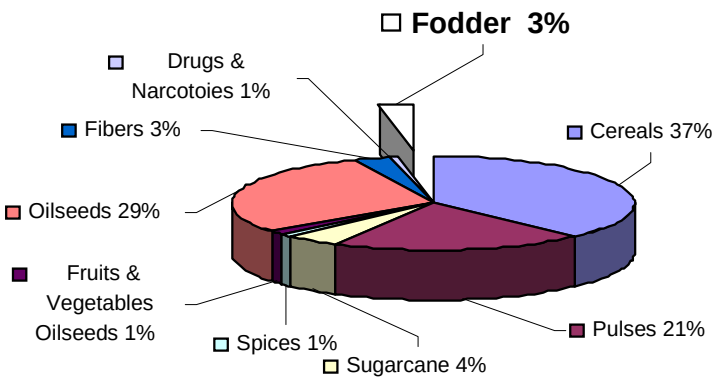
(Thousands)

S. No.	Districts	1992	1997	2002	2007	AAGR (%)
1	Jabalpur (+ Katni)	1317.99	1520.09	1089.63	1351.07	0.17
2	Balaghat	897.99	913.73	936.49	1006.61	0.81
3	Chhindwara	1107.34	1163.83	1176.19	1 308.78	1.21
4	Seoni	727.97	768.25	716.45	837.78	1.01
5	Mandla +Dindori	1005.09	1056.08	1051.84	2081.86	7.14
6	Narsinghpur	509.32	505.27	625.99	587.32	1.02
7	Sagor	978.64	959.32	851.40	1267.61	1.97
8	Damoh	634.60	702.99	734.46	823.80	1.99
9	Panna	749.05	713.41	976.61	869.24	1.07
10	Tikamgarh	923.57	830.44	920.18	1365.54	3.19
11	Chhatarpur	1278.82	1232.36	1137.37	1369.87	0.47
12	Rewa	1179.27	1152.40	1056.87	1418.07	1.35
13	Sidhi	1377.72	1371.94	1670.52	1820.09	2.14
14	Satna	1146.17	1085.08	1094.60	1474.90	1.91
15	Shahdol (+Anuppur+ Umaria)	1395.19	1369.20	1386.98	1614.87	1.05
16	Indore	466.84	507.42	476.47	534.99	0.97
17	Dhar	977.94	1084.92	1527.37	1232.05	1.73
18	Jhabua	934.40	1108.58	1260.31	1490.46	3.97
19	Kargoan (+ Badwani)	1379.73	1547.41	2019.14	1888.40	2.46
20	Khandwa (+ Burhanpur)	792.81	874.75	798.24	1006.64	1.80
21	Ujjain	642.08	728.77	794.27	932.20	3.01
22	Mandsour (+ Neemuch)	1041.89	1108.61	1240.86	1248.15	1.32
23	Ratlam	537.92	625.51	764.46	693.11	1.92
24	Dewas	625.49	687.56	693.13	789.06	1.74
25	Shajapur	689.50	738.92	844.53	877.14	1.81
26	Morena (+ Sheopur)	1072.24	1295.34	1156.49	1402.08	2.05
27	Bhind	601.86	699.12	706.40	706.82	1.16
28	Gwalior	792.06	678.44	612.92	837.15	0.38
29	Shivpuri	1119.37	1126.73	1195.33	1509.70	2.32
30	Gunna (+ Ashoknagar)	892.58	922.73	1001.78	1219.56	2.44
31	Datia	271.93	296.85	414.19	503.11	5.67
32	Bhopal	234.56	247.01	286.26	356.49	3.47
33	Sehore	542.42	594.32	625.04	622.22	0.98
34	Raisen	552.57	558.67	659.78	682.41	1.57
35	Vidisha	556.97	574.82	1119.62	654.79	1.17
36	Betul	788.19	821.83	916.97	976.10	1.59
37	Rajgarh	675.38	794.32	779.93	1294.93	6.12
38	Hosangabad (+ Harda)	735.49	802.44	851.56	833.85	0.89
Madhya Pradesh		**32400.06**	**34054.03**	**36498.90**	**41629.46**	**1.90**

3.2 Fodder Cultivation:

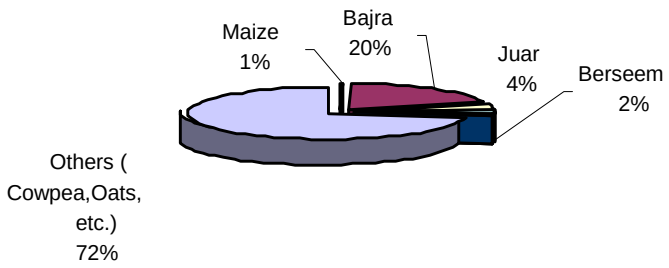
Fodder cultivation is still found to be in a nascent stage in Madhya Pradesh. The cultivators of Madhya Pradesh devoted only their 3 per cent of gross cropped area under fodder. (Fig.3.1)

Fig 3.6: Share of Fodder in Gross Cropped Area (21.05 lakh ha) in M.P.

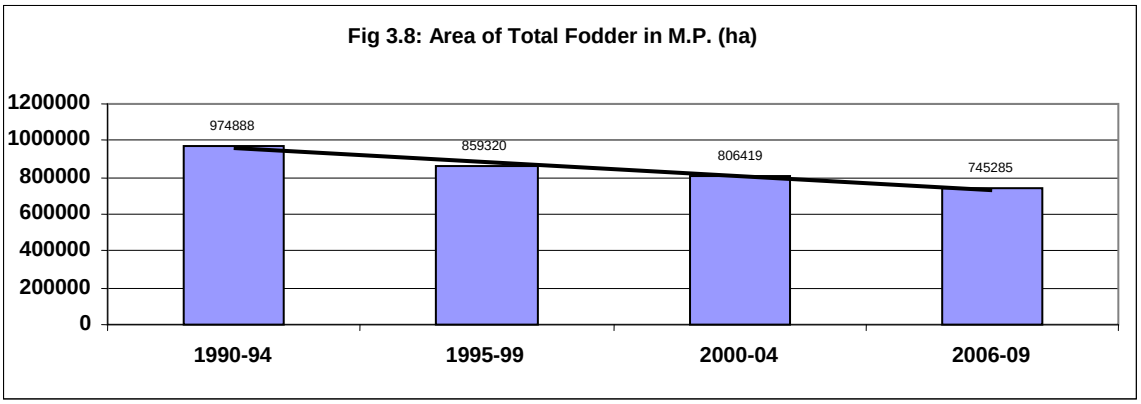


Out of the total fodder area (0.74 lakh ha), the cultivators of Madhya Pradesh devoted their maximum area under the cultivation of bajra (20%) followed by Jowar (4%), Berseem (2%) and Maize (1%). The 72% of the fodder area is found to be covered under unidentified other fodder crops. The Bajra which was found to be highly cultivated by the cultivators, but it was found to be mainly cultivated for grain purposes rather than fodder. The by product of this crops is used as a fodder for the live stock. Thus, jowar, berseem and maize were found to be major fodder crops in the state. (Fig.3.7)

Fig. 3.7: Share of Different Fodder Crops in M.P.(Total : 745285 ha)



The area of fodder was found to be declined over the years from 974888 ha. (1990-94) to 745285 (2006-09) in Madhya Pradesh during the last 20 years. (Fig.:3.8)



The area of *Jowar,* Berseem, Loosarn, *Jai* were found to be increased over the year 1990-94 (Table 3.2.1), while the area under *guar* and other fodder decreased in Madhya Pradesh.

Table 3.2.1 : Average Area of Major Fodder Crops in Different Periods in M.P. (5 year Average)

S. No.	Crops	1990-94	1995-99	2000-04	2006-09
1	Maize	5532	5245	6415	6326
2	*Bajra*	156294	140041	176951	184055
3	Jowar	43338	37294	39618	37785
4	Berseem	13930	19721	19929	20305
5	Loosarn	4769	6116	7523	8192
6	*Jai*	836	472	777	1366
7	*Guar*	3573	4397	7761	1789
8	Others (Cowpea, Oats, etc.)	746615	646033	547445	485468

As regards to the growth of these are concerned in Madhya Pradesh, the areas of all the fodder crops was found to be decrease with the rate of 1.97 per cent per year during the last 20 years.(Table 3.2.2) The growth of these fodders was found to be more in the period I (2.52%/year) as compared to period II (-2.40%/year).

Among the different fodder crops the highest growth of fodder was observed in the area of loosarn (4.98%/year) followed by berseem (3.89%/year), *jowar* (2.79%/year), *jai* (2.39%/year) and maize (1.99%/year) during the last 20 years in Madhya Pradesh. (Table 3.2.2).

Table 3.2.2: Average Annual Compound growth rate of area and their coefficient of Variance of Major Fodder Crops in M.P.

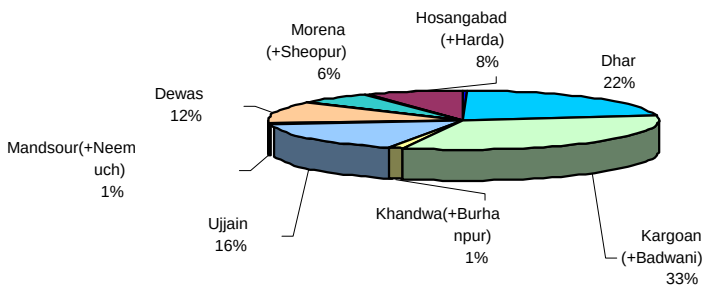
S. No.	Crops	1990-1991 to 1999-00 (Period I)		2000-01 to 2008-09 (Period II)		1990-1991 to 2008-09 (Period III)	
		Growth	C.V.	Growth	C.V.	Growth	C.V.
1	Maize	-2.01	893	1.71	438	1.99	2766
2	*Bajra*	3.53	-11732	-1.55	-2430	-1.09	-10418
3	*Jowar*	-5.88	8161	2.24	1793	2.79	12150
4	Berseem	-4.88	2191	-0.11	-34	3.89	5953
5	Loosarn	0.89	-48	22.68	858	4.98	925
6	*Jai*	-5.07	1668	-24.69	-5980	2.39	2779
7	*Guar*	2.89	-165771	-4.17	-88457	-3.17	-476908
8	Other	2.12	-25875	2.3	16482	1.42	55004
Total Fodder		2.52	-190513	-2.45	-77330	-1.97	-407749

The growth of maize, *jowar* and loosarn was found to be more in period II as compare to period I, while the growth of *bajra* and *guar* was found to be more in period I as compared to period II. The growth of berseem was found to be negative in period I (-4.88%/yerar) and period II (-0.11%/yerar) but it was found to be positive in period III (3.89%/yerar). The growth of other fodder was found to be positive in all the period of the study and it is found to be more in period II (2.23%/year) as compared to period I. (2.52%/ year).

3.2.3 Maize (Kharif season) fodder:

The cultivation of maize fodder is concentrated only in Khargone (33%), Dhar (22%), Ujjain (16%), Dewas (12%), Hoshangabad (8%), Morena (6%), Mandsur (1%) and Khandwa (1%) districts of Madhya Pradesh. (Fig.3.9).

Fig. 3.9: Share of Maize Fodder in different Districts of M.P.



The area of maize is found to be increased by 14.35 per cent (2006-09) as compared to 1990-04 (55.32ha.). As regards to growth of maize fodder over the period of last 20 years. It is found that the area of fodder increased with an annual growth of 1.99 per cent per year during the last 20 years (period III). The growth of maize was found to be more in period II (1.71%/year) as compared to period I (-2.01 %/year). The growth of maize was found to be negative in all the district of Madhya Pradesh during period I except in Dhar. (2.44%/year),Ujjain 2.73%/year) and Ratlam (2.55%/year) districts Whereas, it was found to be positive in Dhar (2.70%/year), Jhabua (24.60%/year), Dewas (18.42%/year), Morena (21.88%/year), Bhopal (25.00%/year) , Rajgarh (4.17%/year) and Hoshangabad (0.73%/year).

The growth of maize is found to be positive in all the maize growing districts of M.P. in the period under study expect in Narsighpur (-10.64%/year), Indore (-1.19%/year, Khargoan (-0.79%/year) and Mandsour (-2.54%/year). The maximum and positive growth of maize fodder was found to be in Bhopal (25.00%/year) followed by Morena (24.48%/year), Hoshangabad (20.85%/year) , Ujjain (17.23%/year), Dewas (14.56%/year), Khandwa(13.12%/year), Shajapur (13.04%/year), Rajgarh(7.68%/year) , Ratlam (7.54%/year) and Shivpuri (6.25%/year) districts of Madhya Pradesh
(Table 3.2.4).

Table 3.2.3 : District wise Average area of Maize (Kharif Season) in different periods in M.P.

(ha)

S. NO.	Districts	1990-94	1995-99	2000-04	2005-09
1	Jabalpur(+Katni)	0	0	0	0
2	Balaghat	0	0	0	0
3	Chhindwara	0	0	0	0
4	Seoni	0	0	0	0
5	Mandla(+Dindori)	0	0	0	0
6	Narsinghpur	140	614	0	0
7	Sagar	0	0	0	0
8	Damoh	0	0	0	0
9	Panna	0	0	0	0
10	Tikamgarh	0	0	0	0
11	Chhattarpur	0	0	0	0
12	Rewa	0	0	0	0
13	Sidhi	0	0	0	0
14	Satna	0	0	0	0
15	Shahdol (+Anuppur+Umaria)	0	0	0	0
16	Indore	1343	917	61	14
17	Dhar	1029	711	1107	1402
18	Jhabua	0	63	11	4
19	Khargone(+Badwani)	2687	2409	2477	2069
20	Khandwa(+Burhanpur)	14	23	129	67
21	**Ujjain**	**136**	**89**	**532**	**1043**
22	Mandsaur(+Neemuch)	72	95	118	37
23	Ratlam	23	2	151	1
24	Dewas	76	275	414	758
25	**Shajapur**	7	27	78	25
26	Morena(+Sheopur)	0	0	98	374
27	Bhind	0	0	0	0
28	Gwalior	0	0	0	0
29	Shivpuri	0	1	9	0
30	Guna(+Ashoknager)	0	0	0	0
31	Datia	0	0	194	8
32	Bhopal	0	0	1	0
33	Sehore	0	0	0	0
34	Raisen	0	0	0	0
35	Vidisha	0	0	0	0
36	Betul	0	0	0	0
37	**Rajgarh**	3	16	13	16
38	Hoshangabad(+Harda)	2	3	1022	512
Madhya Pradesh		**5532**	**5245**	**6415**	**6326**

Table 3.2.4: District wise Average Annual Compound Growth Rate of area and their Co-efficient of Variance (CVs) of Maize (Kharif Season) in M.P

(Percentage)

S. No	Districts	1990-1991 to 1999-00 (Period I)		2000-01 to 2008-09 (Period II)		1990-1991 to 2008-09 (Period III)	
		Growth	C.V.	Growth	C.V.	Growth	C.V.
1	Narsinghpur	-11.47	356.55		0.00	-10.64	-566.24
2	Indore	-1.77	164.90	-44.69	-85.29	-13.19	-2165.53
3	Dhar	2.44	-175.50	2.70	128.86	2.54	611.18
4	Jhabua	-29.62	77.95	24.60	8.86	0.44	2.35
5	Khargone(+Badwani)	0.01	-1.55	-2.13	-201.43	-0.79	-470.24
6	Khandwa(+Burhanpur)	-14.71	22.45	-14.07	-62.71	13.12	178.71
7	Ujjain	2.73	-25.30	24.93	675.71	17.23	1426.94
8	Mandsaur(+Neemuch)	-2.42	16.70	-55.32	-209.29	-2.54	-53.76
9	Ratlam	25.57	-25.95	-49.64	-214.71	7.54	93.65
10	Dewas	-29.22	423.05	18.42	377.29	14.56	1097.29
11	**Shajapur**	-23.81	33.40	-1.87	-4.71	13.04	112.71
12	Morena(+Sheopur)		0.00	21.88	154.43	24.48	426.82
13	Shivpuri	-8.48	0.35	-75.00	-18.43	6.25	4.24
14	Datia	-54.55	0.45	-24.62	-138.43	16.72	232.47
15	Bhopal		0.00	25.00	0.57	25.00	1.41
16	**Rajgarh**	-24.05	18.85	4.17	2.29	7.68	20.71
17	Hoshangabad(+Harda)	-31.27	6.45	0.73	25.43	20.85	1813.24
Madhya Pradesh		**-2.01**	**892.80**	**1.71**	**437.86**	**1.99**	**2766.29**

3.2.4 Berseem:

The area of Berseem was mainly concentrated in Shajapur, Hoshangabad, Sehore, Ujjain, Ratlam, Bhopal, Shivpuri, Indore, Bhind, Mandsaur, Dhar Morena, Narsinghpur, Betul and Jabalpur districts of Madhya Pradesh (Table 3.2.5). The fodder growers of Balaghat, Chhindwara, Seoni, Damoh, Rewa, Satna, Dhar, Jhabua, Guna, Datia, Raisen, Vidisha and Rajgarh also cultivated Berseem as a fodder crop in their fields. The area of Berseem is increased by 45.76 per cent in the year 2005-09 (20305 hectares) as compared to the year 1990-94 (13930 hectares).

As regards to the growth of Berseem is concerned in different district of Madhya Pradesh it is found that the area of Berseem is increased with an annual growth rate of 2.82 per cent /year during the last 20 years. The growth of area of Berseem was found to be more in period II (2.24%/year) as compared to period I (-5.54%/year) in Madhya Pradesh. The growth of area of Berseem was found to be negative in all the districts of Madhya Pradesh except Mandla (44.26%/year), Gwalior (29.22%/year), Shivpuri (11.27%/year), Khargone (11.62%/year), Jhabua (9.41%/year), Panna (7.07%/year), Khandwa (4.94%/year) and Guna (1.43 %/year) in period I of the study, while it was found to be positive in Narsinghpur, Sagar, Chhatarpur, Rewa, Shahdol, Dhar, Jhabua, Ratlam, Dewas, Shajapur, Bhopal, Sehore, Raisen, Vidisha, Betul and Rajgarh districts of Madhya Pradesh. in period II. The growth of Berseem was found to be positive in all the district of Madhya Pradesh except Chhindwara, Mandla, Damoh, Panna, Sidhi, Khargone, Khandwa, Ujjain, Ratlam, Dewas, Gwalior, Shivpuri and Guna districts of Madhya Pradesh in period III of the study (Table 3.2.6)

Table 3.2.5 : District wise Average area of Berseem (Rabi Season) in different Periods in M.P (ha)

S. No.	Districts	1990-94	1995-99	2000-04	2005-09
1	Jabalpur(+Katni)	335	471	477	358
2	Balaghat	79	88	54	59
3	Chhindwara	14	21	21	6
4	Seoni	20	61	45	55
5	Mandla(+Dindori)	7	0	1	0
6	Narsinghpur	347	493	570	502
7	Sagar	54	62	81	77
8	Damoh	10	16	15	9
9	Panna	50	51	20	0
10	Tikamgarh	743	879	1167	1133
11	Chhattarpur	58	79	211	236
12	Rewa	70	84	80	74
13	Sidhi	6	9	2	0
14	Satna	55	52	43	245
15	Shahdol(+Anuppur+Umaria)	2	8	11	1
16	Indore	1032	1544	1973	1175
17	Dhar	426	355	286	615
18	Jhabua	18	15	11	13
19	Khargone(+Badwani)	139	54	47	18
20	Khandwa(+Burhanpur)	9	4	5	1
21	**Ujjain**	1219	2061	1757	1613
22	Mandsaur(+Neemuch)	916	1404	865	817
23	Ratlam	944	1682	765	1277
24	Dewas	12	232	175	317
25	**Shajapur**	1150	2102	1699	2123
26	Morena(+Sheopur)	45	61	699	595
27	Bhind	622	955	1129	905
28	Gwalior	658	131	0	0
29	Shivpuri	1615	832	1261	1062
30	Guna(+Ashoknager)	48	51	18	29
31	Datia	296	370	758	771
32	Bhopal	712	1224	1272	1249
33	Sehore	1049	1568	1520	1991
34	Raisen	167	228	228	278
35	Vidisha	65	111	152	253
36	Betul	73	108	91	378
37	**Rajgarh**	1	1	1	16
38	Hoshangabad(+Harda)	866	2252	2418	2060
Madhya Pradesh		13930	19721	19929	20305

Table 3.2.6: District wise Average Annual Compound Growth Rate of Area and their Co-efficient of Variance (CVs) of Berseem (Rabi Season) in M.P

(Percentage)

S. No	Districts	1990-1991 to 1999-00 (Period I)		2000-01 to 2008-09 (Period II)		1990-1991 to 2008-09 (Period III)	
		Growth	C.V.	Growth	C.V.	Growth	C.V.
1	Jabalpur(+Katni)	-6.41	212.80	-7.55	-133.71	1.52	153.29
2	Balaghat	-4.11	28.25	-4.72	-10.43	-2.63	-45.35
3	Chhindwara	-9.63	13.75	-17.46	-11.57	0.45	1.82
4	Seoni	-24.41	81.95	4.82	9.29	6.41	67.35
5	Mandla(+Dindori)	44.26	-12.05	-12.50	-0.29	-24.55	-12.82
6	Narsinghpur	-6.53	226.35	0.01	0.14	3.54	402.12
7	Sagar	-2.49	11.90	7.57	24.14	3.84	61.65
8	Damoh	-5.04	5.45	-17.93	-9.43	-0.19	-0.59
9	Panna	7.07	-29.40	-60.78	-35.43	-12.35	-105.65
10	Tikamgarh	-5.25	351.45	0.54	25.14	4.06	930.00
11	Chhattarpur	-10.70	60.20	8.44	73.71	12.02	375.06
12	Rewa	-3.41	21.60	-4.88	-15.29	0.51	9.47
13	Sidhi	-0.26	0.15	-46.88	-2.14	-11.71	-13.06
14	Satna	-4.56	22.10	41.89	169.00	9.26	169.18
15	Shahdol (+Anuppur+Umaria)	-12.12	5.00	-38.43	-11.86	2.48	3.65
16	Indore	-2.33	211.10	-4.73	-330.43	4.04	1321.59
17	Dhar	3.30	-106.50	29.01	441.00	1.04	96.71
18	Jhabua	9.41	-12.65	0.60	0.29	-4.74	-16.47
19	Khargone(+Badwani)	11.62	-92.15	-27.03	-41.86	-10.90	-189.59
20	Khandwa(+Burhanpur)	4.94	-2.65	-22.32	-3.57	-6.23	-8.18
21	Ujjain	-8.72	1180.60	-2.67	-183.29	1.93	773.47
22	Mandsaur(+Neemuch)	-8.34	797.95	-7.09	-241.43	-1.07	-266.12
23	Ratlam	-2.27	245.45	19.36	705.43	-1.43	-393.00
24	Dewas	-41.09	412.90	12.35	106.57	12.47	480.12
25	**Shajapur**	-13.17	1767.35	11.59	844.00	4.36	1785.65
26	Morena(+Sheopur)	-21.83	95.65	-1.16	-31.00	17.82	1311.82
27	Bhind	-9.75	634.10	-4.01	-170.86	4.03	872.82
28	Gwalior	29.22	-951.30			-24.63	-1372.00
29	Shivpuri	11.27	-1137.80	-2.89	-139.43	-2.63	-767.18
30	Guna(+Ashok nager)	1.43	-5.85	-2.89	-2.43	-6.99	-63.53
31	Datia	-3.73	102.45	-4.93	-150.29	7.20	880.24
32	Bhopal	-10.68	853.35	2.39	120.86	4.45	1163.76
33	Sehore	-7.52	811.55	10.05	665.57	4.21	1464.53
34	Raisen	-7.26	118.40	2.73	26.43	3.32	172.24
35	Vidisha	-11.62	84.45	15.34	110.86	9.44	286.00
36	Betul	-8.99	67.15	29.43	203.29	9.80	292.47
37	**Rajgarh**	-4.85	0.40	62.84	13.29	21.90	14.53
38	Hoshangabad(+Harda)	-11.86	1525.30	-2.39	-221.43	5.27	2363.82
Madhya Pradesh		**-5.54**	**7598.75**	**2.24**	**1792.86**	**2.82**	**12199.82**

3.2.5 Jowar :

The *jowar* cultivation as a fodder is concentrated in Indore, Khargone, Dhar, Mandsaur, Vidisha, Ujjain, Shajapur, Morena, Gwalior, Sehore, Rajgarh, Ratlam, Dewas, Datia, Shivputi, Hoshangabad, Jhabua and Jabalpur districts of Madhya Pradesh. The cultivators of Chhindwara, Khandwa, Guna, Raisen, and Betul also had grown *Jowar* as a fodder in the state. The area of *Jowar* was found to be decreased to 37785 hectares (2006-09) from 43338 hectares (1990-94) in Madhya Pradesh (Table 3.2.7).

As regards to the growth of area of *Jowar* fodder in M.P. is concerned, it is found that the area of *Jowar* is decreased with a rate of -1.10 per cent per year during the last 20 years. The growth of area of *Jowar* was found to be more in period I (3.50%/year) as compared to period II (-1.55%/year). The growth of area of *jowar* was found to be negative in all the district of Madhya Pradesh in period III except Jabalpur, Chhindwara, Khargone, Ratlam, Shajapur, Morena, Bhind, Gwalior, Shivpuri, Bhopal, Sehore, Raisen Vidisha, Betul, Rajgarh and Hoshangabad districts. The growth of *Jowar* was found to be positive in most of the district of Madhya Pradesh in period I except Jabalpur Chhindwara, Damoh, Rewa, Sidhi, Indore, Dhar, Jhabua, Khargone, Ujjain, Mandsaur, Dewas, Bhind, Morena, Gwalior, Shivpuri, Guna, Datia, and Hoshangabad districts. The area of *Jowar* was found to be negative in all the districts of Madhya Pradesh except in Jabalpur, Chhindwara, Chhattarpur, Khargone, Ratlam, Morena, Bhind, Shajapur, Gwalior, Datia, Bhopal, Sehore, Raisen, Betul, Rajgarh and Hoshangabad districts in period of the study.

Table 3.2.7: District wise Average area of *Jowar Chari* (Summer Season) in periods in M.P.

(ha)

S. No.	Districts	1990-94	1995-99	2000-04	2006-09
1	Jabalpur (+Katni)	68	38	38	132
2	Balaghat	0	0	0	0
3	Chhindwara	1	5	0	10
4	Seoni	0	0	0	0
5	Mandla (+ Dindori)	0	0	0	0
6	Narsinghpur	215	527	0	0
7	Sagar	0	44	0	0
8	Damoh	1	0	0	0
9	Panna	0	0	0	0
10	Tikamgarh	0	0	0	0
11	Chhattarpur	0	0	1	0
12	Rewa	5	2	0	0
13	Sidhi	1	0	0	0
14	Satna	9	0	0	0
15	Shahdol (+ Umaria +Anuppur)	0	0	0	0
16	Indore	4195	3419	3904	4358
17	Dhar	6698	7218	4773	3605
18	Jhabua	68	41	117	173
19	Khargone (+ Badwani)	6132	3540	4324	4371
20	Khandwa (+ Burhanpur)	28	65	4	24
21	Ujjain	3504	3138	3235	2250
22	Mandsaur (+ Neemuch)	3577	3381	3577	2866
23	Ratlam	468	789	1316	1172
24	Dewas	1870	1751	1999	1330
25	**Shajapur**	2179	2488	3193	2573
26	Morena (+ Sheopur)			1906	2397
27	Bhind	1092	747	933	1577
28	Gwalior	1313	179	1817	2152
29	Shivpuri	666	537	342	517
30	Guna(+ Ashok nagar)	909	398	214	169
31	Datia	455	475	603	606
32	Bhopal	596	751	1143	1016
33	Sehore	1132	1696	1273	1659
34	Raisen	10	28	27	6
35	Vidisha	4904	3076	2373	2567
36	Betul	1	13	4	5
37	**Rajgarh**	1049	1209	2491	1834
38	Hoshangabad (+ Harda)	58	2	13	421
Madhya Pradesh		**43338**	**37294.4**	**39618**	**37785**

Table 3.2.8: District wise Average Annual Compound Growth Rate of area and their Co-efficient of Variance (CVs) of *Jowar* (Summer Season) in different periods in M.P.

S. No	Districts	1990-1991 to 1999-00 (Period I)		2000-01 to 2008-09 (Period II)		1990-1991 to 2008-09 (Period III)	
		Growth (%)	C.V. (%)	Growth (%)	C.V. (%)	Growth (%)	C.V. (%)
1	Jabalpur(+Katni)	5.1	-22.1	39.44	101.86	3.8	52.8
2	Chhindwara	0.9	-0.2	75.00	8.57	6.1	3.9
3	Narsinghpur	-12.6	385.3			-10.3	-537.8
4	Sagar	-30.3	54.5			-4.2	-12.8
5	Damoh	42.4	-1.8			-29.2	-2.1
6	Chhattarpur			0.00	0.00	20.8	1.5
7	Rewa	23.8	-7.3			-22.7	-11.9
8	Sidhi	32.7	-1.4			-25.8	-1.8
9	Satna	32.0	-11.4			-25.6	-15.5
10	Indore	4.9	-1532.1	-2.13	-343.57	-0.6	-576.5
11	Dhar	1.7	-975.3	-5.91	-1050.14	-4.4	-6191.9
12	Jhabua	7.2	-32.5	0.13	0.71	6.8	142.2
13	Khargone(+Badwani)	8.3	-3309.4	2.85	494.86	-2.5	-2769.5
14	Khandwa(+Burhanpur)	-12.8	49.1	32.14	12.86	-5.4	-40.8
15	**Ujjain**	**2.0**	**-561.5**	**-5.40**	**-638.14**	**-1.8**	**-1348.4**
16	Mandsaur(+Neemuch)	3.0	-868.9	0.47	63.43	-0.9	-702.4
17	Ratlam	-7.7	397.0	-3.23	-164.57	7.0	1496.6
18	Dewas	1.2	-172.3	-5.05	-365.43	-0.6	-258.1
19	**Shajapur**	-2.7	520.6	-8.15	-983.00	2.1	1306.2
20	Morena(+Sheopur)	3.5	-551.8	7.47	611.71	0.3	153.6
21	Bhind	9.3	-704.2	9.97	445.57	0.7	176.2
22	Gwalior	37.4	-2298.8	8.59	657.29	4.5	1320.5
23	Shivpuri	3.2	-159.9	-1.00	-15.71	-4.3	-532.9
24	Guna(+Ashok nager)	9.1	-491.5	-7.31	-58.71	-11.1	-1245.6
25	Datia	2.0	-77.9	-6.02	-145.57	1.4	179.9
26	Bhopal	-5.7	319.4	4.70	207.86	5.7	1164.9
27	Sehore	-4.1	476.2	4.18	231.43	0.9	311.6
28	Raisen	-16.3	26.0	-3.06	-2.57	3.7	17.7
29	Vidisha	7.4	-2430.1	1.11	108.00	-5.7	-4600.6
30	Betul	-27.2	15.7	-10.34	-1.71	1.9	2.6
31	**Rajgarh**	-3.0	275.3	-19.74	-1818.57	4.7	1831.4
32	Hoshangabad(+Harda)	16.7	-41.0	41.17	213.14	15.8	269.0
Madhya Pradesh		3.5	-11732.1	-1.55	-2430.43	**-1.1**	**-10417.9**

.....

CHAPTER –IV

SOCIO ECONOMIC CHARACTERISTICS OF FODDER GROWERS

The Socio economic characteristics of selected fodder growers of M.P. are dealt in detail in this chapter. The demographics features, land resources, farm power machinery, livestock resources, cropping pattern, production status of fodder crops, livestock population, milk and meat production and feeding practices of live stocks were considered in the Socio economic characteristics of fodder growers of the study area.

4.1 Demographic Features:

The size of family, educational status annual family income and number of permanent labours engaged in different size of farms were considered in the demographic features of fodder growers. The percentage distribution of all these factors in different size of farms is presented in Table 4.1. It is observed from of data that on an over all average basis the 57 per cent of fodder growers had medium size (4 - 8 members) of family while 40 per cent and 4 per cent had large (above 8 members) and small (less than 4 members) size of family respectively. It is also observed that as a size of farms of fodder growers increases their family size decreases in all the size groups, while in case of large size groups of fodder growers the size of family was found to be increased with the size of farms.

It is also found that the 52 per cent of the fodder growers were found to be illiterate while 21, 16, 06, 05 per cent of fodder growers were found to be in the category of primary, metric, secondary and college level education respectively. The percentage of illiterate fodder growers were found to be decreases from 82 per cent (marginal) to 24 per cent (large) with increase of size of farms, whereas the percentage of Primary educated, metric educated, secondary educated and college level educated fodder growers were found to be increased with the size of farm.

On an over all average basis the 52 per cent of fodder growers were belongs to higher age group (above 50 years) while 39 per cent and 9 per cent of fodder growers respectively fell in below to mid (30- 50 years) and low (below 30 years) age groups. In all categories of farms the maximum percentage of fodder growers belongs to higher age group as compare to low age group.

Table: 4.1 General Characteristics of Selected Fodder Growers in M.P.

(Per cent)

Particulars	Farm Size category					
	Marginal	Small	Semi-medium	Medium	Large	Overall
Average Family Size						
Less than 4	4	8	2	1	1	3
4--8	81	79	47	41	36	57
Above 8	15	13	51	58	63	40
Total	100	100	100	100	100	100
Educational status of head of the family						
Illiterate	82	76	49	29	24	52
Primary	14	18	24	21	27	21
Metric	2	5	19	37	19	16
Secondary	2	1	5	9	13	6
Higher	0	0	3	4	17	5
Age of Head (Years)						
Up to 30	6	12	9	2	16	9
31-50	41	57	27	39	33	39
Above 50	53	31	64	59	51	52
Total	100	100	100	100	100	100
Annual family Income (Rs.)						
Less than 50,000	17	8	2	0	0	5
50,000-1,00,000	74	63	51	34	13	47
1,00,000-2,50,000	9	29	39	52	19	30
2,50,000-5,00,000	0	0	8	14	47	14
More than 5,00,000	0	0	0	0	21	4
Permanent farm labour						
Male						
Number	0	0	0	8	12	4
Wages (Rs./month)	0	0	0	2193	2208	2201
Female						
Number	0	0	0	5	7	2
Wages (Rs./month)	0	0	0	1520	1728	1624
Children						
Number	0	0	0	0	0	0
Wages (Rs./month)	0	0	0	0	0	0

It is also observed that maximum number of fodder growers had an annual income between 0.50 – 1.0 lakh per year, while 30, 14, 5, and 4 per cent of fodder growers were found to be came under 1.0 to 2.50 lakh, 2.5 lakh to 5.0 lakh, less than 0.50 lakh and above 5.0 lakh annual income group respectively. As regards to the marginal, small and semi medium fodder growers, the maximum number of fodder growers comes under the 0.5 to 1.00 lakh annual income group, while the maximum numbers of fodder growers belongs to medium and large size of farms were found to be comes respectively under 1-2.5 lakh (52%) and 2.5 – 5.0 lakh (47%).

It is surprising to note that fodder growers belongs to marginal, small, semi medium categories had not engaged any permanent labours at their farms, whereas 8 & 12 per cent of fodder growers belongs to medium and large size of farms engaged male permanent at their farms. The 5 per cent and 7 per cent of fodder growers belongs to medium and large size of farms also engaged female permanent labours at their farms. There was found to be much variation in the wage rate of male (Rs.2201/month) and female (Rs.1624/month) permanent labour in the area under study.(Table 4.1)

4.2 Land Resources:

The average fodder grower was found to be had 6.66 ha of land in his ownership, out of which he cultivated his 5.47 ha and 0.47 ha was found to be remained fallow (Table 4.2). The average marginal, small, semi-medium, medium and large farmer were found to be having respectively of 0.78 ha, 1.28 ha, 2.98ha, 7.13 ha and 21.12 ha of land at their ownership. All of them were found to be cultivated their whole area under cultivation expect medium and large fodder growers who left out their 0.23 ha and 2.13 ha of un-irrigated area under fallow. The cent per cent fodder growers had irrigation facilities at their farms. The maximum numbers of fodder growers reported that there was not found any contract for leased in and leased out land in the area under study.

Table: 4.2 Average land holding of Selected Fodder Growers in M.P.

(ha)

Particulars	Farm Size category					
	Marginal	Small	Semi-medium	Medium	Large	Overall
Owned land						
Irrigated	0.69	1.15	2.41	6.72	16.4	5.47
Un irrigated	0.09	0.13	0.57	0.41	4.72	1.18
Total	0.78	1.28	2.98	7.13	21.12	6.66
Leased-in land						
Irrigated	0	0	0	0	0	0
Un irrigated	0	0	0	0	0	0
Total	0	0	0	0	0	0
Leased-out land						
Irrigated	0	0	0	0	0	0
Un irrigated	0	0	0	0	0	0
Total	0	0	0	0	0	0
Fallow land						
Irrigated	0	0	0	0	0	0.00
Un irrigated	0	0	0	0.23	2.13	0.47
Total	0	0	0	0.23	2.13	0.47
Total operational land						
Irrigated	0.69	1.15	2.41	6.72	16.4	5.47
Un irrigated	0.09	0.13	0.57	0.18	2.59	0.71
Total	0.78	1.28	2.98	6.9	18.99	6.19

4.3 Farm, Power and Machinery:

It is found to noticed that only 20 percent of the fodder growers of the study area had their owned tractors at their farms, while 15 per cent (23), 29 per cent (44), 35 per cent (52), 9 per cent (13), 20 per cent (30) and 70 per cent (105) had trolley, diesel engine, bullock carts, cultivators and spray pump respectively (Table 4.3). The cent percent fodder growers had small tolls and electric pumps at their farms. It is interesting to note that none of fodder grower had chaff cutter for fodder cutting in their farm. This denoted that fodder grower of the study area not done milk production at commercial line. They only grow fodder for fulfilling the daily requirement of their few cattle and buffaloes. The majority of live stock found in the study area of local breed and they grow fodder for them in little quantity. The quality aspects of fodder production were also found to be ignored by them. Their farm development and machinery and equipment were found neither to be tuned with fodder production nor to milk production.

Table 4.3: Farm Power Machinery and buildings of Selected Fodder Growers in M.P.

Type of machine	Marginal		Small		Semi-medium		Medium		Large		Overall	
	No.	PV	No.	PV	No.	PV	No.	PV	No.	PV	No.	PV
1. Tractor	0	0	1	3.20	3	3.95	7	3.6	19	4	30	2.93
2. Trolley	0	0	1	0.56	1	0.51	5	0.6	16	0.5	23	0.43
3. Harrow	0	0	0	0	0	0	0	0	0	0	0	0.00
4. Cultivator	0	0.0	1	0.10	1	0.09	3	0.1	8	0.1	13	0.07
5. Electric motor	30	0.09	30	0.1	30	0.11	30	0.1	30	0.1	150	0.12
6. Diesel Engine	3	0.28	5	0.3	8	0.31	17	0.30	11	0.3	44	0.30
7. Planker	0	0.0	0	0	0	0	0	0	0	0	0	0.00
8. Spray pump	6	0.01	19	0	22	0.01	28	0.01	30	0	105	0.01
9. Generator	0	0.0	0	0	0	0	0	0	0	0	0	0.00
10. Cart	6	0.10	9	0.11	12	0.12	11	0.12	14	0.14	52	0.09
11. Drip System	0	0.0	0	0	0	0	0	0	0	0	0	0.00
12. Small tools	30	0.01	30	0	30	0	30	0.02	30	0	150	0.02
13. Shed for fodder	0	0.0	0	0	0	0	0	0	0	0	0	0.00
14. Chaff cutter	0	0.0	0	0	0	0	0	0	0	0	0	0.00
14. Others	0	0.0	0	0	0	0	0	0	0	0	0	0.00

Note: PV is the Present value (Rs.)

4.4 Livestock population:

The present status of live stock of fodder growers at different size of farms is presented in Table 4.4. It is found to noted from the data that as regards to 30 fodder

growers had marginal size of farm, they found to be reared 12 adult female in milk , 9 adult female in dry, 16 adult male, 5 and 7 respectively of male and female young stock of cattle at their farm. They also reared 14 adult female in milk, 6 adult female in dry, 6 young stocks male and 9 young stock female of buffaloes at their farm. The 19, 31 and 22 respectively numbers of male, female and young stock of goats. None of them were found to be reared crossbreed cattle and adult male of buffaloes.

As regards to 30 fodder growers had small size of farm, they found be reared 7 adult female in milk , 8 adult female in dry, 19 adult male, 3 and 4 respectively of male and female young stock of indigenous cattle at their farm . As regards to buffaloes are concerned they found to be reared 13 adult female in milk, 9 adult female in dry, 4 young stock male and 9 young stock female. They also reared 16, 39 and 42 respectively of male, female and young stock of goat. None of them were found to be reared crossbreed cattle, adult male of buffaloes at their farm.

As regards to 30 fodder growers had semi-medium size of farm, they found to be reared 14 adult female in milk , 9 adult female in dry, 24 adult male, 8 and 6 respectively of male and female young stock of indigenous cattle. As regards to buffaloes are concerned, they found to be reared 28 adult female in milk , 12 adult female in dry , 12 young stock male and 16 young stock female. They also reared 17, 12 and 11 respectively of male, female and young stock of goat. They also found to be reared 1 cross breed cattle and 1 adult male of buffalo at their farm.

As regards to 30 fodder growers had medium size of farm, they found to be reared 18 adult female in milk ,16 adult female in dry, 24 adult male, 6 and 12 respectively of male and female young stock of indigenous cattle. As regards to buffaloes are concerned they found be reared 31 adult female in milk , 18 adult female in dry , 21 young stock male and 10 young stock female. They also reared 17, 7 and 6 respectively of male, female and young stock of goat. They also found to be reared 2 cross breed cattle and 2 adult male of buffalo at their farm.

As regards to 30 fodder growers had large size of farm, they found to be reared 12 adult female in milk ,7 adult female in dry, 28 adult male, 4 and 8 respectively of male and female young stock of indigenous cattle. As regards to buffaloes they found to be reared 46 adult female in milk , 18 adult female in dry , 22 young stock male and 24 young stock female. They also reared 9, 14 and 13 respectively of male, female and young stock of goat. They also found to be reared 2 cross breed cattle and 3 adult male of buffalo. It is also observed they also reared 1 female horse at their farms.

The total respondents 150 fodder growers had found to be reared 63 adult female in milk, 49 adult female in dry, 111 adult male, 26 and 37 respectively of male and female young stock of indigenous cattle at their farm. As regards to buffaloes are concerned , they found to be reared 132 adult female in milk , 63 adult female in dry , 65 young stock male and 68 young stock female. They also reared 78, 103 and 94 respectively of male, female and young stock of goat. They also found to be reared 5 cross breed cattle and 6 adult male of buffalo at their farm. None of the fodder growers of the area found to be reared sheep, pig, camel etc. animals at their farm. The present value of indigenous cows cross breed cows and buffalo were found to be Rs. 0.10 lacs, Rs. 0.20 lacs and Rs. 0.23 lacs respectively in the area under study.

It is concluded that as the size of farms increases the number of cross breed cattles, buffaloes were found to be increased, while the number of goats were found to be decreased. The indigenous cattles of different types were found to be remained same in all the groups of farms. The present value of cross breed cattle and buffaloe were found to be double as compared to indigenous cattles.

Table 4.4: Livestock population of Selected Fodder growers in M.P.

Particulars	Marginal		Small		Semi-medium		Medium		Large		Overall	
	No.	PV	No.	PV	No.	PV	No.	PV	No.	PV	No.	PV
1. Indigenous Cattle												
Adult female in milk	12	0.08	7	0.09	14	0.10	18	0.10	12	0.11	63	0.10
Adult female in dry	9	0.03	8	0.03	9	0.03	16	0.03	7	0.03	49	0.03
Adult Male	16	0.12	19	0.12	24	0.13	24	0.12	28	0.14	111	0.13
Young stock (male)	5	0.01	3	0.01	8	0.01	6	0.01	4	0.01	26	0.01
Young stock (female)	7	0.03	4	0.03	6	0.03	12	0.03	8	0.03	37	0.03
2. Crossbreed Cattle												
Adult female in milk	0	0.00	0	0.00	1	0.33	2	0.33	2	0.33	5	0.20
Adult female in dry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Adult Male	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Young stock (male)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Young stock (female)	0	0.00	0	0.00	0	0.00	1	0.22	1	0.20	2	0.08
3. Buffalo												
Adult female in milk	14	0.31	13	0.03	28	0.29	31	0.29	46	0.24	132	0.23
Adult female in dry	6	0.16	9	0.15	12	0.15	18	0.16	18	0.15	63	0.15
Adult male	0	0.00	0	0.00	1	0.12	2	0.13	3	0.13	6	0.08
Young stock (male)	6	0.02	4	0.02	12	0.02	21	0.02	22	0.02	65	0.02
Young stock (female)	9	0.04	9	0.04	16	0.03	10	0.04	24	0.03	68	0.04
4. Sheep												
Male	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Female	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Young stock	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
5. Goat												
Male	19	0.02	16	0.02	17	0.02	17	0.02	9	0.02	78	0.02
Female	31	0.01	39	0.01	12	0.01	7	0.01	14	0.01	103	0.01
Young stock	22	0.01	42	0.01	11	0.01	6	0.01	13	0.01	94	0.01
6. Pig												
Male	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Female	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Young stock	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
6. Camel												
Male	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Female	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Young stock	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
7. Horse												
Male	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Female	0	0.00	0	0.00	0	0.00	0	0.00	1	0.40	1	0.08
Young stock	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
8. Other_____												
Male	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Female	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Young stock	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

Note: PV is the Present value (Rs.in lacs)

4.5 Cropping Pattern:

The majority fodder growers of the study area adopted Soybean based cropping pattern at their farm.(Table 4.5) Soybean was found to be main Kharif crop of the area, in which an average farmer devoted his 92.54 per cent of the net cropped area. Wheat (51.90%) and Gram (40.59%) were found to be the major crop of Rabi season, reveals

that the Soybean- Wheat and Soybean –Gram are found to be the main cropping pattern of the study area. Maize (5.46%) was found to be major fodder crop of the Kharif season, while Berseem (5.25%) and Jowar (5.25%) were found to be major Rabi and summer crop of the study area respectively**.**

Table 4.5: Cropping Pattern of an average fodder grower in M.P.

(Per cent to gross cropped area)

Season/Crop	Marginal	Small	Semi-medium	Medium	Large	Overall
A. Kharif						
1. Soybean	89.74	93	94.18	97.34	88.5	92.54
2. Maize						
Fodder						
i. Maize	10.26	7.03	5.82	2.66	1.53	5.46
B. Rabi						
1. Wheat	39.74	42.19	48.00	63.54	66.30	51.95
2. Gram	50.00	50.78	46.18	33.80	22.17	40.59
Fodder						
i. Berseem	10.26	7.03	5.82	2.16	0.99	5.25
ii. Lucerne	0.00	0.00	0.00	0.50	0.54	0.21
C. Summer	0.00	0.00	0.00	0.00	0.00	0.00
1. Vegetables	50.00	50.78	46.18	33.80	22.17	40.59
Fodder	0.00	0.00	0.00	0.00	0.00	0.00
i. Jowar	7.69	6.25	4.70	2.17	1.00	5.25
Fruits	0.00	0.00	0.00	0.00	0.00	0.00
1. Kinnow	0.00	0.00	0.00	0.00	10.00	2.00
Net cropped area (ha.)	**0.78**	**1.28**	**2.98**	**6.9**	**19**	**6.19**
Gross cropped area	**0.69**	**1.15**	**2.41**	**6.72**	**16.40**	**5.47**

Irrespective to the season the fodder grower of the study area devoted their 1.53 % (large) to 1.26 % (marginal) of gross cropped area in the cultivation of fodder. The 10 % of large sized fodder growers also engaged in the “kinnow” cultivation. It was also found that The area of “Kinnow” cultivation on commercial was also to be found increased year to year in the study area during the course of investigation but seen only at medium and large size of fodder grower farms.

4.6 Present Status of Fodder Crops:

The present status of area, production, and productivity of major crops of the selected fodder growers of different categories of farms as compared to last 10 years are observed in the study area and presented in sub head.

4.6.1 Area of Fodder crops:

The present status of the area of all the major crops grown by the fodder growers as compared to last 10 years is observed in per cent multiple responses and presented in Table 4.6.1. It is observed from the data that the on an over all basis the 70 per cent of fodder growers of different size of farms reported that their area under fodder was remained same as compared to last 10 years. They devoted same area of land under different seasons of fodder as they were devotes before last 10 year. As for as the crops of fodder are concerned, the fodder growers had medium and large sized of farm, lucerne was the crop grown by the fodder growers. Although they reported that the area of this particular crop was also the same as compared to the last 10 years. They preferred this particular crop in the *Rabi* season, as they got 2 more cutting than that of Berseem crop. On over all basis , it was observed that the fodder growers devoted their 75.33 per cent , 70.00 per cent and 65.33 per cent of area respectively under maize, Berseem and *jowar* The findings are found to be at par for all the fodder growers had different size farms.

Table 4.6.1: Present status of area of fodder crops as compared to 10 years before of Selected Fodder Growers

(Per cent multiple response)

Season/Crop	Marginal	Small	Semi-medium	Medium	Large	Overall
A. Kharif : Maize						
Increased	6.67	10.00	16.67	6.67	3.33	8.67
Decreased	16.66	10.00	10.00	23.33	20.00	16.00
Remained same	76.67	80.00	73.33	70.00	76.67	75.33
B. Rabi : i) Berseem						
Increased	16.67	10.00	13.33	13.33	6.67	12.00
Decreased	13.33	23.33	6.67	10.00	36.67	18.00
Remained same	70.00	66.67	80.00	76.67	56.66	70.00
ii) Lucerne						
Increased	0.00	0.00	0.00	0.00	0.00	0.00
Decreased	0.00	0.00	0.00	0.00	0.00	0.00
Remained same	0.00	0.00	0.00	100.00	100.00	40.00
C. Summer : Jowar						
Increased	22.00	40.00	6.67	30.00	23.33	24.40
Decreased	6.67	10.00	13.33	10.00	13.33	10.67
Remained same	73.33	50.00	80.00	60.00	63.34	65.33

4.6.2 Production of Fodder crops:

The present status of the production of all the major fodder crops grown by the fodder growers as compared to last 10 years was observed in per cent multiple responses and presented in Table 4.6.2. It is observed from the data that the on an over all basis the above 48 per cent of fodder growers had different size of farms reported that their fodder production was increased as compared to last 10 years, while about 40 percent of fodder growers reported that they harvested same produce as they harvested 10 year before. The finding are found to be similar in different size of fodder growers with minor variation This was might be due to the lack of extension activities (technical know-how of cultivation) of fodder crops at their field. There was found the lack of coordination between the department of agriculture and animal husbandry in the area under study during the course of investigation. The mini kit of fodder crops were found to be distributed by the animal husbandry department and they were not taking interest in the extension activities concern to the fodder, due to lack of training in it and it lacks the aura of being doctor and the fodder is more inclined towards agriculture. The animal husbandry department in the state is only concerned with the treatment aspect and improvement of breeds because here lays the money. Investing interest in fodder sector will benefit the live stock owners but who cares? Hence, there is urgent need to create the a separate department for fodder development separate from animal husbandry department or merge the fodder development sector in agriculture department for better extension activities and distribution of fodder min kits with technical know-how because the cultivation of fodder is more or less similar to the cultivation of crops.

Table 4.6.2: Present status of <u>production</u> of fodder crops as compared to 10 years before of Selected Fodder Growers

(Per cent multiple response)

Season/Crop	Marginal	Small	Semi-medium	Medium	Large	Overall
A. Kharif : Maize						
Increased	46.67	50.00	48.34	50.00	45.00	48.00
Decreased	10.00	5.00	8.34	11.67	10.00	9.00
Remained same	43.34	45.00	43.33	38.34	45.00	43.00
B. Rabi : Berseem						
Increased	55.00	46.67	48.33	51.67	43.34	49.00
Decreased	6.67	13.33	3.34	5.00	23.34	10.33
Remained same	38.34	40.01	48.34	43.34	33.33	40.67
: Lucerne						
Increased	0.00	0.00	0.00	0.00	0.00	0.00
Decreased	0.00	0.00	0.00	0.00	0.00	0.00
Remained same	0.00	0.00	0.00	100.00	100.00	40.00
C. Summer : Jowar						
Increased	47.67	60.00	48.34	56.67	60.00	54.53
Decreased	6.67	5.00	11.67	5.00	6.67	7.00
Remained same	45.67	35.00	40.00	38.34	33.34	38.47

4.6.3 Productivity of Fodder crops:

The present status of the yield of all the major crops grown by the fodder growers as compared to last 10 years was observed in per cent multiple responses and presented in Table 4.6.3 It is observed from the data that the on an over all basis the majority of fodder growers (above 80 %) had different size of farms reported that the productivity of fodder was increased as compared to last 10 years, while only 10 percent of fodder growers reported that they harvested same yield as they harvested 10 year before. This was might be due to the introduction of new high yielding varieties of fodder in the study area.

Table 4.6.3: Present status of yield of fodder crops as compared to 10 years before of Selected Fodder Growers in M.P.

(Per cent multiple response)

Season/Crop	Marginal	Small	Semi-medium	Medium	Large	Overall
A. Kharif : Maize						
Increased	86.67	90.00	80.00	93.33	86.67	87.33
Decreased	3.33	0.00	6.67	0.00	0.00	2.00
Remained same	10.00	10.00	13.33	6.67	13.33	10.67
B. Rabi : i.Berseem						
Increased	93.33	83.33	83.33	90.00	80.00	86.00
Decreased	0.00	3.33	0.00	0.00	10.00	2.67
Remained same	6.67	13.34	16.67	10.00	10.00	11.34
ii. Lucerne						
Increased	0.00	0.00	0.00	0.00	0.00	0.00
Decreased	0.00	0.00	0.00	0.00	0.00	0.00
Remained same	0.00	0.00	0.00	100.00	100.00	40.00
C. Summer						
i. Jowar						
Increased	73.33	80.00	90.00	83.33	96.67	84.67
Decreased	6.67	0.00	10.00	0.00	0.00	3.33
Remained same	20.00	20.00	0.00	16.67	3.33	12.00

4.7 Present status of livestock population and their products:

The present status of the livestock population and their product as compared to last 10 years before was also observed in per cent multiple responses and present in this sub head.

4.7.1 Livestock population

The present status of livestock population as compared to last 10 years before of sample respondent of different size of farms was observed and presented in table 4.7.1. It is observed from the data that the 80% of fodder growers reported that that the population of male as well as female cattle decreases as compared to 10 years before in the area

under study, while the population of buffaloes was found to be increased. The more than 90% of fodder grower reported that the population of male buffaloes was also found to be decrease as compared to last 10 years. The more than 70% of fodder growers reported that the population of goat was remained same as compared to 10 years before. Therefore, it is concluded that the population of cattles and male buffaloe were found to be decreased as compared to last 10 years while the population of female buffalo and goat was respectively increased and remain same in the area under study. There was no remarkable change was observed in this regards in the opinions of fodder growers belongs to different size of farms.

Table 4.7.1: Present status of livestock population compared to 10 years before of selected respondents in M.P.

(Per cent multiple response)

Season/Crop	Marginal	Small	Semi-medium	Medium	Large	Overall
1. **Cattle** :**1.** Male						
Increased	3.33	6.67	6.67	10	3.33	6.00
Decreased	86.67	90.00	83.33	86.67	93.34	88.00
Remained same	10.00	3.33	10.00	3.33	3.33	6.00
ii. Female						
Increased	6.67	0.00	0.00	0.00	3.33	2.00
Decreased	83.33	96.67	93.33	96.67	96.67	93.33
Remained same	10.00	3.33	6.67	3.33	0.00	4.67
2. Buffalo : i. Male						
Increased	0.00	0.00	0.00	3.33	3.33	1.33
Decreased	96.67	93.33	96.67	93.34	96.67	95.34
Remained same	3.33	6.67	3.33	3.33	0.00	3.33
ii. Female						
Increased	66.67	83.33	86.66	96.67	93.34	85.33
Decreased	3.33	6.67	6.67	0.00	3.33	4.00
Remained same	30.00	10.00	6.67	3.33	3.33	10.67
3. Sheep						
Increased	0.00	0.00	0.00	0.00	0.00	0.00
Decreased	0.00	0.00	0.00	0.00	0.00	0.00
Remained same	0.00	0.00	0.00	0.00	0.00	0.00
4. Goat						
Increased	26.67	16.67	30.00	6.67	3.33	16.67
Decreased	13.33	10.00	13.33	10.00	6.67	10.67
Remained same	60.00	73.33	56.67	83.33	90.00	72.67
5. Horse						
Increased	0.00	0.00	0.00	0.00	0.00	0.00
Decreased	0.00	0.00	0.00	0.00	0.00	0.00
Remained same	0.00	0.00	0.00	0.00	0.00	0.00
6. Pig						
Increased	0.00	0.00	0.00	0.00	0.00	0.00
Decreased	0.00	0.00	0.00	0.00	0.00	0.00
Remained same	0.00	0.00	0.00	100.00	100.00	40.00
7. Any other						
Increased	0.00	0.00	0.00	0.00	0.00	0.00
Decreased	0.00	0.00	0.00	0.00	0.00	0.00
Remained same	0.00	0.00	0.00	0.00	0.00	0.00

4.7.2 Milk or meat yield

During the course of investigation it is observed that none of the fodder grower raring the male cattles and male buffaloes for meat production in the area under study. The present status of milk or meat yield in different size of farms as compared to last 10 years before of sample respondent is observed and presented in table 4.7.2. It is observed

from the data that more than 90% of fodder growers reported that that the milk yield of female cattle (cows) decreases as compared to 10 years before in the area under study, while the milk yield of buffaloes was found to be increased. The more than the 70% of fodder growers reported that the goat meat yield was remained same as compared to 10 years before. Therefore, it is concluded that the milk yield of cows was found to be decreased while the milk yield of female buffalo was found to increased as compared to last 10 years. The goat meat yield was found to be remained same during the last 10 years. There was no remarkable change was observed in this regards in the opinions of fodder growers belongs to different size of farms (Table 4.7.2).

Table 4.7.2: Present status of livestock milk or meat yield compared to 10 years before of selected respondents in M.P.

(Per cent multiple response)

Season/Crop	Marginal	Small	Semi-medium	Medium	Large	Overall
1**. Cattle (Female)**						
Increased	6.67	0	0	0	3.33	2.00
Decreased	83.33	96.7	93.33	96.67	96.67	93.33
Remained same	10	3.33	6.67	3.33	0	4.67
2. Buffalo (Female)						
Increased	66.67	83.3	86.66	96.67	93.34	85.33
Decreased	3.33	6.67	6.67	0	3.33	4.00
Remained same	30	10	6.67	3.33	3.33	10.67
3. Goat						
Increased	26.67	16.67	30.00	6.67	3.33	16.67
Decreased	13.33	10.00	13.33	10.00	6.67	10.67
Remained same	60.00	73.33	56.67	83.33	90.00	72.67
4. Pig						
Increased	0.00	0.00	0.00	0.00	0.00	0.00
Decreased	0.00	0.00	0.00	0.00	0.00	0.00
Remained same	0.00	0.00	0.00	100.00	100.00	40.00

4.8 Feeding Practices of Live Stocks:

The per cent multiple response feeding practices of different types of live stocks viz. indigenous cattles, cross breed cattles, buffaloes, and goats prevails and adopted by the fodder growers belongs to different size of farms and the season wise feeding practices of different types of live stocks for different seasons were also analysed and presented in this sub head.

Table 4.8.1: Livestock feeding practices of selected respondents in M.P.

(Per cent multiple response)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Overall
1. Indigenous Cattle						
Adults						
Stall feeding	66.67	73.3	60.00	63.33	70.00	66.67
Grazing	10.00	6.67	6.67	13.33	13.33	10.00
Both	23.33	20.00	33.33	23.34	16.67	23.33
Young stock						
Stall feeding	83.33	80.00	86.67	93.34	93.34	87.34
Grazing	3.33	6.67	10.00	3.33	6.66	6.00
Both	13.34	13.33	3.33	3.33	0.00	6.67
2. Crossbreed Cattle						
Adults						
Stall feeding	80.00	93.34	96.67	93.34	90.00	90.67
Grazing	6.67	3.33	3.33	3.33	6.67	4.67
Both	13.33	3.33	0.00	3.33	3.33	4.66
Young stock						
Stall feeding	93.34	76.67	90.00	80.00	83.33	84.67
Grazing	3.33	13.33	10.00	6.67	6.67	8.00
Both	3.33	10.00	0.00	13.33	10.00	7.33
3. Buffalo						
Adults						
Stall feeding	86.66	83.33	80.00	93.34	96.67	88.00
Grazing	6.67	10.00	10.00	3.33	3.33	6.67
Both	6.67	6.67	10.00	3.33	0.00	5.33
Young stock						
Stall feeding	70.00	80.00	90.00	80.00	93.34	82.67
Grazing	20.00	10.00	3.33	13.33	3.33	10.00
Both	10.00	10.00	6.67	6.67	3.33	7.33
4. Goat						
Stall feeding	6.67	3.33	6.67	3.33	6.67	5.33
Grazing	83.33	80.00	80.00	90.00	90.00	84.67
Both	10.00	16.67	13.33	6.67	3.33	10.00

4.8.1 Per cent Multiple Responses:

The per cent multiple response feeding practices of different types of live stocks viz. indigenous cattles, cross breed cattles, buffaloes, and goats prevailed and adopted by the fodder growers belongs to different size of farms is presented in table 4.8.1 It is observed from the data that the grazing of the live stock in the pasture land was not found in practice by the fodder growers in the area under study as the more than 60 per cent of fodder growers reported that they adopted stall feeding for the cattles and buffaloes instead of grazing . This is happened due to the fact that the M.P. government passed an act in the year 2003 in which the pasture land restricted to 2 per cent of total geographical area of the village under the section 237.and the pasture land above 2 per cent had been

distributed among landless farmers related schedule cast & schedule tribe and hance now the grazing land was found to be reduced year to year. The fodder growers left their dry un-productive cattles from their farms and now they are found be seen in the road sides of cities and towns of the study area. The more than 80 per cent of fodder growers reported that they left their goats for grazing in the near by forest area.

4.8.2 Season wise feeding practices:

The season wise feeding practices for the different types of live stock population adopted by the fodder growers belongs to different size of farms are also observed and their farms wise details are presented in Table 4.8.2, 4.8.3, 4.8.4, 4.8.5, 4.8.6 and 4.8.7 respectively for marginal, small, semi-medium, medium , large and over all average size of farm.

4.8.2.1 Marginal Farmers:

The fodder growers fed their cattles with the seasonal green fodders, wheat/ soybean straw, oil cakes and *chuni* (gram husk etc.)in the area under study. As regards to "in milk animals" the fodder growers belongs to the marginal farms fed (table 4.8.2)an indigenous cow with 12.67 kg. maize fodder, 2.49 kg. of wheat straw and 1.33 kg. oilcake/ day in the rainy season, while they fed 12.33 kg berseem, 1.11 kg. soybean straw and1.82 kg. oil cake/ day in the winter season. In the summer season they fed their indigenous cow with 7.31 kg. of jowar 1.32 kg. of wheat straw and 1.91 kg. of oil/ day cake. As regards to cross breed cows are concern an average fodder grower fed 14.79 kg. maize fodder, 3.11 kg. of wheat straw and 1.48 kg. oilcake/ day in the rainy season, while they fed 11.21 kg. berseem, 1.47 kg. soybean straw and 1.87 kg. oil cake/ day in the winter season. In the summer season they fed their cross breed cow with 7.72 kg. of jowar 1.17 kg. of wheat straw and 1.78 kg. of oil/ day cake. An average fodder grower fed his single buffaloe with 17.41 kg. maize fodder, 2.81 kg. of wheat straw and 2.16 kg. oilcake/ day in the rainy season, while they fed 12.11 kg. berseem, 1.71 kg. soybean straw and 1.96 kg. oil cake/ day in the winter season. In the summer season they fed his single buffalo with 8.11 kg. of jowar 1.72 kg. of wheat straw and 2.01 kg. of oil cake/ day.

Table 4.8.2: Season-wise feeding practices for livestock population adopted by marginal farmers, in Madhya Pradesh

(Kg/animal/day)

Season/Crop	In Milk Animals			Dry animals			Male		Young Stock	Sheep	Goat
	Ind. cows	X-breed	Buffalo	Ind. cows	X-breed	Buffalo	Cattle	Buffalo			
A. Rainy Season											
1. Green Fodder											
i. Maize	12.67	14.79	17.41	10.00	12.43	14.78	12.41	14.22	9.38	0.00	1.12
2. Dry fodder											
i. Wheat straw	2.49	3.11	2.81	1.84	1.98	1.27	1.41	1.33	1.11	0.00	0.48
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.33	1.48	2.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B Winter season											
1. Green Fodder											
i. Berseem	12.33	11.21	12.11	9.31	9.72	11.36	12.88	13.97	7.71	0.00	1.43
2. Dry fodder											
i. Wheat straw	1.11	1.47	1.71	1.12	1.39	1.65	1.94	1.34	1.60	0.00	0.53
iii. Any other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.82	1.87	1.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	0.05	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Summer season											
1. Green Fodder											
i. Juar	7.31	7.72	8.11	6.24	7.04	7.56	8.44	5.32	5.71	0.00	0.48
2. Dry fodder											
i. Wheat straw	1.32	1.71	1.72	1.13	1.31	1.14	1.61	1.34	1.11	0.00	0.52
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.91	1.78	2.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	0.05	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

As regards to dry animals the fodder growers belongs to the marginal farms fed an indigenous cow with 10.00 kg. maize fodder and 1.84 kg. of wheat straw day in the rainy season, while they fed 9.31kg berseem and 1.12 kg. soybean straw day in the winter season. In the summer season they fed their indigenous cow with 6.24 kg. of jowar and 1.13 kg. of wheat straw / day. As regards to cross breed cows are concern an average fodder grower fed 12.43 kg. maize fodder and 1.98 kg. of wheat straw / day in the rainy season, while they fed 9.72 kg. berseem, and 1.12 kg. soybean straw / day in the winter season. In the summer season they fed their cross breed cow with 7.04 kg. of jowar and

1.31 kg. of wheat straw / day cake. An average fodder grower fed his single buffalo with 14.78 kg. maize fodder and 1.27 kg. of wheat straw / day in the rainy season, while they fed 11.36 kg. berseem and 1.65 kg. soybean straw / day in the winter season. In the summer season they fed his single buffalo with 7.56 kg. of jowar and 1.14 kg. of wheat straw / day.

As regards to male, cattle are concerned the fodder growers belong to the marginal farms fed an individual bullock with 12.41 kg. maize fodder and 1.41 kg. of wheat straw / day in the rainy season, while they fed 12.88 kg. berseem and 1.94 kg. soybean straw day in the winter season. In the summer season they fed a bullock with 8.44 kg. of jowar and 1.61 kg. of wheat straw / day.

As regards to male buffalo are concerned the fodder growers belong to the marginal farms fed an individual buffalo with 14.22 kg. maize fodder and 1.33 kg. of wheat straw / day in the rainy season, while they fed 13.97 kg. berseem and 1.34 kg. soybean straw day in the winter season. In the summer season they fed a buffalo with 5.71 kg. of jowar and 1.11 kg. of wheat straw / day.

As regards to the young stock are concerned the fodder growers belong to the marginal farms fed young stock with 9.38 kg. maize fodder and 1.11 kg. of wheat straw / day in the rainy season, while they fed 7.71 kg. berseem and 1.60 kg. soybean straw / day in the winter season. In the summer season they fed a young stock with 5.71 kg. of jowar and 1.11 kg. of wheat straw / day.

As regards to goat are concerned the fodder growers belong to the marginal farms fed an individual goat with 1.12 kg. maize fodder and 0.48 kg. of wheat straw / day in the rainy season while they fed 1.43 kg. berseem and 0.53 kg. soybean straw / day in the winter season. In the summer season, they fed a goat with 0.48 kg. of jowar and 0.52 kg. of wheat straw / day.

4.8.2.2 Small Farmers:

The fodder growers fed their cattles with the seasonal green fodders, wheat/ soybean straw, oil cakes and *chuni* (gram husk etc.) in the area under study. As regards to "milk animals" the fodder growers belongs to the small farms (Table 4.8.3) fed an indigenous cow with 12.76 kg. maize fodder, 2.59 kg. of wheat straw and 1.49 kg. oilcake/ day in the rainy season, while they fed 12.123 kg berseem, 1.07 kg. soybean straw and 1.78 kg. oil cake/ day in the winter season. In the summer season they fed an indigenous cow with 7.28 kg. of jowar 1.39 kg. of wheat straw and 1.97 kg. of oil/ day

cake. As regards to cross breed in milk cows are concern an average fodder grower fed a cross breed cow with 14.84 kg. maize fodder, 3.15 kg. of wheat straw and 1.56 kg. oilcake/ day in the rainy season, while they fed 11.26 kg. berseem, 1.49 kg. soybean straw and 1.93 kg. oil cake/ day in the winter season. In the summer season, they fed their cross breed cow with 7.69 kg. of jowar 1.81 kg. of wheat straw and 1.81 kg. of oil cake / day. An average fodder grower fed his single buffaloe with 17.68 kg. maize fodder, 2.94 kg. of wheat straw and 2.82 kg. oil cake / day in the rainy season while they fed 12.48 kg. berseem, 1.62 kg. soybean straw and 1.89 kg. oil cake/ day in the winter season. In the summer season they fed a buffalo with 8.26 kg. of jowar 1.97 kg. of wheat straw and 2.13 kg. of oil cake/ day.

Table 4.8.3: Season-wise feeding practices for livestock population adopted by Small farmers, in Madhya Pradesh

(Kg/animal/day)

Season/Crop	In Milk Animals			Dry animals			Male		Young Stock	Sheep	Goat
	Ind. cows	X-breed	Buffalo	Ind. cows	X-breed	Buffalo	Cattle	Buffalo			
A. Rainy Season											
1. Green Fodder											
i. Maize	12.76	14.84	17.68	10.09	12.48	14.82	12.63	14.26	9.47	0.00	1.18
2. Dry fodder											
i. Wheat straw	2.59	3.15	2.94	1.94	1.99	1.34	1.46	1.52	1.06	0.00	0.53
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.49	1.56	2.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B Winter season											
1. Green Fodder											
i. Berseem	12.12	11.26	12.48	9.36	9.78	11.24	12.27	13.82	7.92	0.00	1.45
2. Dry fodder											
i. Wheat straw	1.07	1.49	1.62	1.32	1.54	1.82	1.96	1.28	1.63	0.00	0.82
iii. Any other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.78	1.93	1.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	0.05	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Summer season											
1. Green Fodder											
i.Juar	7.28	7.69	8.26	6.94	7.04	7.48	8.31	5.53	5.87	0.00	0.61
2. Dry fodder											
i. Wheat straw	1.39	1.81	1.97	1.09	1.26	1.32	1.63	1.41	1.01	0.00	0.39
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.97	1.81	2.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	0.05	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

As regards to dry animals the fodder growers belong to the small farms is concerned they fed an indigenous cow with 10.09 kg. maize fodder and 1.94 kg. of wheat straw / day in the rainy season while they fed 9.36 kg berseem and 1.32 kg. soybean straw / day in the winter season. In the summer season, they fed an indigenous cow with 6.94 kg. of jowar and 1.09 kg. of wheat straw / day. As regards to cross breed cows are concern an average fodder grower fed 12.48 kg. maize fodder and 1.99 kg. of wheat straw / day in the rainy season while they fed 9.78 kg. berseem, and 1.54 kg. soybean straw / day in the winter season. In the summer season, they fed a cross breed cow with 7.04 kg.

of jowar and 1.26 kg. of wheat straw / day cake. An average fodder grower fed his single buffalo with 14.82 kg. maize fodder and 1.34 kg. of wheat straw / day in the rainy season, while they fed 11.24 kg. berseem and 1.82 kg. soybean straw / day in the winter season. In the summer season, they fed a buffaloes with 7.48 kg. of jowar and 1.32 kg. of wheat straw / day.

As regards to male, cattle are concerned the fodder growers belong to the small farms fed an individual bullock with 12.63 kg. maize fodder and 1.46 kg. of wheat straw / day in the rainy season, while they fed 12.27 kg. berseem and 1.96 kg. soybean straw / day in the winter season. In the summer season, they fed a bullock with 8.31 kg. of jowar and 1.63 kg. of wheat straw / day.

As regards to male buffalo are concerned the fodder growers belong to the small farms fed an individual buffalo with 14.22 kg. maize fodder and 1.33 kg. of wheat straw / day in the rainy season while they fed 13.97 kg. berseem and 1.34 kg. soybean straw / day in the winter season. In the summer season, they fed a buffalo with 5.71 kg. of jowar and 1.11 kg. of wheat straw / day.

As regards to the young stock are concerned the fodder growers belong to the small farms fed them with 9.47 kg. maize fodder and 1.06 kg. of wheat straw / day in the rainy season, while they fed 7.92 kg. berseem and 1.63 kg. soybean straw / day in the winter season. In the summer season, they fed them with 5.87 kg. of jowar and 1.01 kg. of wheat straw / day.

As regards to in goat are concerned the fodder growers belong to the small farms fed an individual goat with 1.18 kg. maize fodder and 0.53 kg. of wheat straw / day in the rainy season, while they fed 1.45 kg. berseem and 0.82 kg. soybean straw / day in the winter season. In the summer season they fed a goat with 0.61 kg. of jowar and 0.39 kg. of wheat straw / day.

4.8.2.3 Semi medium Farmers:

The fodder growers fed their cattles with the seasonal green fodders, wheat/ soybean straw, oil cakes and *chuni* (gram husk etc.)in the area under study. The fodder growers belong to the semi medium farms (Table 4.8.4) fed an indigenous cow with 12.82 kg. maize fodder, 2.64 kg. of wheat straw and 1.56 kg. oilcake/ day in the rainy season, while they fed 12.21 kg berseem, 1.11 kg. soybean straw and 1.83 kg. oil cake/ day to a cow in the winter season. In the summer season, they fed an indigenous cow with 7.33 kg. of jowar, 1.53 kg. of wheat straw and 1.98 kg. of oil cake / day.

As regards to cross breed in milk cows are concern an average fodder growers belong to the semi medium fed 14.69 kg. maize fodder, 3.39 kg. of wheat straw and 1.53 kg. oilcake/ day in the rainy season, while they fed 11.39 kg. berseem, 1.53 kg. soybean straw and 2.03 kg. oil cake / day in the winter season. In the summer season, they fed their cross breed cow with 7.71 kg. of jowar 1.89 kg. of wheat straw and 1.86 kg. of oil cake / day.

An average fodder grower belongs to the semi medium fed his single buffaloe with 17.52 kg. maize fodder, 2.78 kg. of wheat straw and 2.87 kg. oilcake/ day in the rainy season, while they fed 12.54 kg. berseem, 1.68 kg. soybean straw and 1.92 kg. oil cake/ day in the winter season. In the summer season they fed a buffalo with 8.21 kg. of jowar 1.79 kg. of wheat straw and 2.06 kg. of oil cake/ day.

As regards to dry animals the fodder growers belong to the semi medium farms fed an indigenous cow with 10.16 kg. maize fodder and 1.96 kg. of wheat straw / day in the rainy season, while they fed 9.43 kg berseem and 1.49 kg. soybean straw / day in the winter season. In the summer season, they fed an indigenous cow with 6.87 kg. of jowar and 1.17 kg. of wheat straw / day. As regards to cross breed cows are concern an average fodder grower fed a cow with 14.47 kg. maize fodder and 2.09 kg. of wheat straw / day in the rainy season, while they fed 9.86 kg. berseem, and 1.48 kg. soybean straw / day in the winter season. In the summer season, they fed a cross breed cow with 7.19 kg. of jowar and 1.34 kg. of wheat straw / day cake. An average fodder grower fed his single buffalo with 14.89 kg. maize fodder and 1.48 kg. of wheat straw / day in the rainy season, while they fed 11.33 kg. berseem and 1.79 kg. soybean straw / day in the winter season. In the summer season, they fed a buffalo with 7.63 kg. of jowar and 1.97 kg. of wheat straw / day.

As regards to male, cattle are concerned the fodder growers belong to the semi medium farms fed an individual bullock with 12.64 kg. maize fodder and 1.87 kg. of wheat straw / day in the rainy season, while they fed 12.41 kg. berseem and 2.07 kg. soybean straw / day in the winter season. In the summer season, they fed a bullock with 8.26 kg. of jowar and 1.67 kg. of wheat straw / day.

Table 4.8.4: Season-wise feeding practices for livestock population adopted by semi - medium farmers in Madhya Pradesh

(Kg/animal/day)

Season/Crop	In Milk Animals			Dry animals			Male		Young Stock	Sheep	Goat
	Ind. cows	X-breed	Buffalo	Ind. cows	X-breed	Buffalo	Cattle	Buffalo			
A. Rainy Season											
1. Green Fodder											
i. Maize	12.82	14.69	17.52	10.16	14.47	14.89	12.64	14.62	9.78	0.00	1.02
2. Dry fodder											
i. Wheat straw	2.64	3.39	2.78	1.96	2.09	1.48	1.87	1.41	1.13	0.00	0.61
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.56	1.53	2.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	1.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B Winter season											
1. Green Fodder											
i. Berseem	12.21	11.39	12.54	9.43	9.86	11.33	12.41	13.85	7.99	0.00	1.31
2. Dry fodder											
i. Wheat straw	1.11	1.53	1.68	1.49	1.48	1.79	2.07	1.31	1.71	0.00	0.63
iii. Any other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.83	2.03	1.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	1.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Summer season											
1. Green Fodder											
i.Juar	7.33	7.71	8.21	6.87	7.19	7.63	8.26	5.64	5.79	0.00	0.74
2. Dry fodder											
i. Wheat straw	1.53	1.89	1.79	1.17	1.34	1.97	1.67	1.38	1.26	0.00	0.59
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.98	1.86	2.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	1.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

As regards to in male buffaloe are concerned the fodder growers belong to the semi medium farms fed an individual buffalo with 14.22 kg. maize fodder and 1.33 kg. of wheat straw / day in the rainy season, while they fed 13.97 kg. berseem and 1.34 kg. soybean straw / day in the winter season. In the summer season, they fed a buffalo with 5.71 kg. of jowar and 1.11 kg. of wheat straw / day.

As regards to the young stock are concerned the fodder growers belong to the semi medium farms fed a young stock with 9.78 kg. maize fodder and 1.13 kg. of wheat straw / day in the rainy season, while they fed 7.99 kg. berseem and 1.71 kg. soybean straw / day in the winter season. In the summer season, they fed young stock with 5.79 kg. of jowar and 1.26 kg. of wheat straw / day.

As regards to goats are concerned the fodder growers belong to the semi medium farms fed an individual goat with 1.02 kg. maize fodder and 0.61 kg. of wheat straw / day in the rainy season, while they fed 1.31 kg. berseem and 0.63 kg. soybean straw / day in the winter season. In the summer season, they fed a buffalo with 0.74kg. of jowar and 0.59 kg. of wheat straw / day.

4.8.2.4 Medium Farmers:

The fodder growers fed their cattles with the seasonal green fodders, wheat/ soybean straw, oil cakes and *chuni* (gram husk etc.)in the area under study. The fodder growers belong to the medium farms fed an indigenous cow in milk with 12.91 kg. maize fodder, 2.75 kg. of wheat straw and 1.72 kg. oilcake/ day in the rainy season, while they fed 12.28 kg berseem, 1.13 kg. soybean straw and 1.88 kg. oil cake/ day in the winter season (Table 4.8.5). In the summer season, they fed an indigenous cow with 7.36 kg. of jowar 1.59 kg. of wheat straw and 2.03 kg. of oil/ day cake.

As regards to cross breed in milk cows are concern an average fodder growers belong to the medium fed 14.68 kg. maize fodder, 3.16 kg. of wheat straw and 1.78 kg. oil cake/ day in the rainy season, while they fed 11.47kg. berseem, 1.62 kg. soybean straw and 2.14 kg. oil cake/ day in the winter season. In the summer season, they fed their cross breed in milk cow with 7.74 kg. of jowar 1.96 kg. of wheat straw and 2.13 kg. of oil / day cake.

An average fodder grower belongs to the medium farms fed his single buffalo in milk with 17.63 kg. maize fodder, 2.81 kg. of wheat straw and 2.69 kg. oilcake/ day in the rainy season, while they fed 12.63 kg. berseem, 1.96 kg. soybean straw and 2.06 kg. oil cake/ day in the winter season. In the summer season, they fed a buffalo in milk with 8.39 kg. of jowar 1.76 kg. of wheat straw and 2.07kg. of oil cake/ day.

As regards to dry animals are concerned the fodder growers belong to the medium farms fed an indigenous dry cow with 10.19 kg. maize fodder and 1.93 kg. of wheat straw day in the rainy season, while they fed 9.59 kg berseem and 1.53 kg.

soybean straw day in the winter season. In the summer season they fed an indigenous dry cow with 6.91 kg. of jowar and 1.23 kg. of wheat straw / day. As regards to cross breed dry cows are concern an average fodder grower fed 14.59 kg. maize fodder and 1.99 kg. of wheat straw / day in the rainy season, while they fed 9.92 kg. berseem, and 1.57 kg. soybean straw / day in the winter season. In the summer season, they fed their cross breed cow with 7.13 kg. of jowar and 1.37 kg. of wheat straw / day cake. An average fodder grower fed his single dry buffalo with 14.94 kg. maize fodder and 1.36 kg. of wheat straw / day in the rainy season, while they fed 11.37 kg. berseem and 1.77 kg. soybean straw / day in the winter season. In the summer season, they fed a dry buffalo with 7.76 kg. of jowar and 1.99 kg. of wheat straw / day.

As regards to male, cattle are concerned the fodder growers belong to the medium farms fed an individual bullock with 12.61 kg. maize fodder and 1.43 kg. of wheat straw / day in the rainy season, while they fed 12.44 kg. berseem and 2.18 kg. soybean straw day in the winter season. In the summer season they fed a bullock with 8.34 kg. of jowar and 1.76 kg. of wheat straw / day.

As regards to in male buffaloe are concerned the fodder growers belong to the medium farms fed an individual male buffalo with 14.31 kg. maize fodder and 1.83 kg. of wheat straw / day in the rainy season, while they fed 13.82 kg. berseem and 1.34 kg. soybean straw day in the winter season. In the summer season they fed a male buffalo with 5.76 kg. of jowar and 1.48 kg. of wheat straw / day.

As regards to the young stock are concerned the fodder growers belong to the medium farms fed young stock with 9.81 kg. maize fodder and 1.46 kg. of wheat straw / day in the rainy season, while they fed 7.96 kg. berseem and 1.69 kg. soybean straw day in the winter season. In the summer season, they fed them with 5.81 kg. of jowar and 1.31 kg. of wheat straw / day.

Table 4.8.5: Season-wise feeding practices for livestock population adopted by <u>medium</u> farmers, in Madhya Pradesh

(Kg/animal/day)

Season/Crop	In Milk Animals			Dry animals			Male		Young Stock	Sheep	Goat
	Ind. cows	X-breed	Buffalo	Ind. cows	X-breed	Buffalo	Cattle	Buffalo			
A. Rainy Season											
1. Green Fodder											
i. Maize	12.91	14.68	17.63	10.19	14.59	14.94	12.61	14.31	9.81	0.00	1.13
2. Dry fodder											
i. Wheat straw	2.75	3.16	2.81	1.93	1.99	1.36	1.43	1.83	1.46	0.00	0.64
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.72	1.78	2.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	1.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B Winter season											
1. Green Fodder											
i. Berseem	12.28	11.47	12.63	9.59	9.92	11.37	12.44	13.82	7.96	0.00	1.29
2. Dry fodder											
i. Wheat straw	1.13	1.62	1.96	1.53	1.57	1.77	2.18	1.34	1.69	0.00	0.73
iii. Any other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.88	2.14	2.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	1.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Summer season											
1. Green Fodder											
i.Juar	7.36	7.74	8.39	6.91	7.13	7.76	8.34	5.76	5.81	0.00	0.62
2. Dry fodder											
i. Wheat straw	1.59	1.96	1.76	1.23	1.37	1.99	1.76	1.48	1.31	0.00	0.76
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	2.03	2.13	2.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	1.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

As regards to goats are concerned the fodder growers belong to the medium farms fed an individual goat with 1.13 kg. maize fodder and 0.64 kg. of wheat straw / day in the rainy season, while they fed 1.29kg. berseem and 0.73 kg. soybean straw day in the winter season. In the summer season they fed a goat with 0.62 kg. of jowar and 0.76 kg. of wheat straw / day.

4.8.2.5 Large Farmers:

The large sized farms fed an indigenous in milk cow with 13.14 kg. maize fodder, 2.83 kg. of wheat straw and 1.82 kg. oil cake/ day in the rainy season, while they fed 12.56 kg berseem, 1.53 kg. soybean straw and 2.09 kg. oil cake/ day in the winter season (Table 4.8.6). In the summer season, they fed their indigenous in milk cow with 7.53 kg. of jowar 1.61 kg. of wheat straw and 2.07 kg. of oil / day cake.

As regards to cross breed in milk cows are concern an average fodder growers belong to the large sized farm fed a cow with14.78 kg. maize fodder, 3.29 kg. of wheat straw and 1.94 kg. oil cake/ day in the rainy season, while they fed 11.68 kg. berseem, 1.89 kg. soybean straw and 2.36 kg. oil cake/ day in the winter season. In the summer season they fed their cross breed in milk cow with 7.91 kg. of jowar 2.13 kg. of wheat straw and 2.09kg. of oil / day cake.

An average fodder grower belongs to the large sized farm fed his single in milk buffalo with 17.79kg. maize fodder, 2.96 kg. of wheat straw and 2.78 kg. oil cake/ day in the rainy season, while they fed 12.96g. berseem, 1.99 kg. soybean straw and 2.43 kg. oil cake/ day in the winter season. In the summer season, they fed a buffalo with 8.61 kg. of jowar 1.93 kg. of wheat straw and 2.36 kg. of oil cake/ day.

As regards to dry animals all concerned the fodder growers belong to the large sized farm fed an indigenous dry cow with 10.27 kg. maize fodder and 2.03kg. of wheat straw / day in the rainy season, while they fed 9.74 kg berseem and 1.68 kg. soybean straw / day in the winter season. In the summer season, they fed an indigenous dry cow with 7.01 kg. of jowar and 1.34 kg. of wheat straw / day. As regards to cross breed dry cows are concern an average fodder grower fed 14.68 kg. maize fodder and 2.01 kg. of wheat straw / day in the rainy season while, they fed 10.13 kg. berseem, and 1.79 kg. soybean straw / day in the winter season. In the summer season, they fed a cross breed dry cow with 7.93 kg. of jowar and 2.04 kg. of wheat straw / day. An average fodder grower fed his single dry buffalo with 14.99kg. maize fodder and 1.39 kg. of wheat straw / day in the rainy season, while they fed 11.66 kg. berseem and 1.81kg. soybean straw / day in the winter season. In the summer season, they fed a dry buffalo with 7.93 kg. of jowar and 2.04 kg. of wheat straw / day.

As regards to male, cattle are concerned the fodder growers belong to large sized farms fed an individual bullock with 12.74 kg. maize fodder and 1.48 kg. of wheat straw / day in the rainy season, while they fed 12.64 kg. berseem and 2.43 kg. soybean straw /

day in the winter season. In the summer season, they fed a bullock with 8.48 kg. of jowar and 1.98 kg. of wheat straw / day.

Table 4.8.6: Season-wise feeding practices for livestock population adopted by large farmers, in Madhya Pradesh

(Kg/animal/day)

Season/Crop	In Milk Animals			Dry animals			Male		Young Stock	Sheep	Goat
	Ind. cows	X-breed	Buffalo	Ind. cows	X-breed	Buffalo	Cattle	Buffalo			
A. Rainy Season											
1. Green Fodder											
i. Maize	13.14	14.78	17.79	10.27	14.68	14.99	12.74	14.51	9.79	0.00	1.27
2. Dry fodder											
i. Wheat straw	2.83	3.29	2.96	2.03	2.01	1.39	1.48	1.99	1.53	0.00	0.82
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.82	1.94	2.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	1.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B Winter season											
1. Green Fodder											
i. Berseem	12.56	11.68	12.96	9.74	10.13	11.66	12.64	13.91	8.01	0.00	1.26
2. Dry fodder											
i. Wheat straw	1.53	1.89	1.99	1.68	1.79	1.81	2.43	1.56	1.99	0.00	0.81
iii. Any other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	2.09	2.36	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	1.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Summer season											
1. Green Fodder											
i.Juar	7.53	7.91	8.61	7.01	7.28	7.93	8.48	5.96	6.26	0.00	0.83
2. Dry fodder											
i. Wheat straw	1.61	2.13	1.93	1.34	1.51	2.04	1.98	1.74	1.56	0.00	0.81
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	2.07	2.09	2.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	1.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

As regards to male buffalo are concerned the fodder growers belong to the large sized farm fed an individual buffalo with 14.51 kg. maize fodder and 1.99 kg. of wheat straw / day in the rainy season, while they fed 13.91 kg. berseem and 1.56 kg. soybean straw / day in the winter season. In the summer season they fed a buffalo with 5.96 kg. of jowar and 1.74kg. of wheat straw / day.

As regards to the young stock are concerned the fodder growers belong to the large sized farm fed young stock with 9.79 kg. maize fodder and 1.53 kg. of wheat straw / day in the rainy season, while they fed 8.01 kg. berseem and 1.99 kg. soybean straw / day in the winter season. In the summer season they fed a young stock with 6.26 kg. of jowar and 1.56 kg. of wheat straw / day.

As regards to in goats are concerned the fodder growers belong to the large sized farm fed an individual goat with 1.27 kg. maize fodder and 0.82 kg. of wheat straw / day in the rainy season while they fed 1.26g. berseem and 0.81kg. soybean straw day in the winter season. In the summer season they fed a goat with 0.83 kg. of jowar and 0.81 kg. of wheat straw / day.

4.8.2.6 An Average Fodder Grower:

Average fodder growers fed an indigenous in milk cow with 12.86 kg. maize fodder, 2.66 kg. of wheat straw and 1.58 kg. oil cake/ day in the rainy season, while they fed 12.30 kg berseem, 1.19 kg. soybean straw and 1.88 kg. oil cake/ day in the winter season. In the summer season they fed an indigenous in milk cow with 7.36 kg. of jowar 1.49 kg. of wheat straw and 1.99 kg. of oil cake / day (Table 4.8.7).

As regards to cross breed in milk cows are concern an average fodder growers a cross breed in milk cow with fed 14.76 kg. maize fodder, 3.22 kg. of wheat straw and 1.66 kg. oil cake / day in the rainy season, while they fed 11.47 kg. berseem, 1.60 kg. soybean straw and 2.07 kg. oil cake / day in the winter season. In the summer season they fed a cross breed in milk cow with 7.75 kg. of jowar 1.90 kg. of wheat straw and 1.93 kg. of oil cake / day (Table 4.8.7).

An average fodder growers fed his single in milk buffalo with 17.61kg. maize fodder, 2.86 kg. of wheat straw and 2.66 kg. oil cake/ day in the rainy season while they fed 12.54 kg. berseem, 1.79 kg. soybean straw and 2.05 kg. oil cake/ day in the winter season. In the summer season they fed an in milk buffalo with 8.32 kg. of jowar 1.83 kg. of wheat straw and 2.13kg. of oil cake/ day.

Table 4.8.7: Season-wise feeding practices for livestock population adopted by over all farmers of Madhya Pradesh

(Kg/animal/day)

Season/Crop	In Milk Animals			Dry animals			Male		Young Stock	Sheep	Goat
	Ind. cows	X-breed	Buffalo	Ind. cows	X-breed	Buffalo	Cattle	Buffalo			
A. Rainy Season											
1. Green Fodder											
i. Maize	12.86	14.76	17.61	10.14	13.73	14.88	12.61	14.38	9.65	0.00	1.14
2. Dry fodder											
i. Wheat straw	2.66	3.22	2.86	1.94	2.01	1.37	1.53	1.62	1.26	0.00	0.62
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.58	1.66	2.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B Winter season											
1. Green Fodder											
i. Berseem	12.30	11.40	12.54	9.49	9.88	11.39	12.53	13.87	7.92	0.00	1.35
2. Dry fodder											
i. Wheat straw	1.19	1.60	1.79	1.43	1.55	1.77	2.12	1.37	1.72	0.00	0.70
iii. Any other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.88	2.07	2.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
iii. Any other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Summer season											
1. Green Fodder											
i.Juar	7.36	7.75	8.32	6.79	7.14	7.67	8.37	5.64	5.89	0.00	0.66
2. Dry fodder											
i. Wheat straw	1.49	1.90	1.83	1.19	1.36	1.69	1.73	1.47	1.25	0.00	0.61
3. Grains											
i. Wheat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Concentrates											
i. Mixed feed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ii. Oil cakes	1.99	1.93	2.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

As regards to dry animals fodder growers fed an indigenous dry cow with 10.14 kg. maize fodder and 1.94 kg. of wheat straw day in the rainy season while they fed 9.49 kg berseem and 1.43 kg. soybean straw / day in the winter season. In the summer season, they fed an indigenous dry cow with 6.79 kg. of jowar and 1.19 kg. of wheat straw / day. As regards to cross breed dry cows are concern an average fodder grower fed a cow with 13.73 kg. maize fodder and 2.01 kg. of wheat straw / day in the rainy season while they fed 9.88 kg. berseem, and 1.55 kg. soybean straw / day in the winter season. In the summer season they fed a cross breed dry cow with 7.14 kg. of jowar and 1.36 kg. of wheat straw / day cake. An average fodder grower fed his single dry buffalo with 14.88

kg. maize fodder and 1.37kg. of wheat straw / day in the rainy season, while they fed 11.39 kg. berseem and 1.77 kg. soybean straw / day in the winter season. In the summer season they fed a dry buffalo with 7.67 kg. of jowar and 1.69 kg. of wheat straw / day

As regards to male, cattle are concerned average fodder growers fed an individual bullock with 12.61 kg. maize fodder and 1.43 kg. of wheat straw / day in the rainy season while they fed 12.44 kg. berseem and 2.18 kg. soybean straw day in the winter season. In the summer season they fed a bullock with 8.34 kg. of jowar and 1.76 kg. of wheat straw / day.

As regards to in male buffalo are concerned an average fodder growers fed an individual buffalo with 14.31 kg. maize fodder and 1.83 kg. of wheat straw / day in the rainy season, while they fed 13.82 kg. berseem and 1.34 kg. soybean straw / day in the winter season. In the summer season they fed a male buffalo with 5.76 kg. of jowar and 1.48 kg. of wheat straw / day.

As regards to the young stock are concerned an average fodder growers fed young stock with 9.81 kg. maize fodder and 1.46 kg. of wheat straw/ animal / day in the rainy season, while they fed 7.96 kg. berseem and 1.69 kg. soybean straw day in the winter season. In the summer season they fed young stock with 5.81 kg. of jowar and 1.31 kg. of wheat straw/ animal / day.

As regards to goats are concerned an average fodder growers fed an individual goat with 1.13 kg. maize fodder and 0.64 kg. of wheat straw / day in the rainy season, while they fed 1.29kg. berseem and 0.73 kg. soybean straw day in the winter season. In the summer season they fed a goat with 0.62 kg. of jowar and 0.76 kg. of wheat straw / day.

.....

CHAPTER – V

ECONOMICS OF PRODUCTION OF FODDER CROPS

This chapter includes the operational cost incurred and returns obtained from the of cultivation major fodder crops viz. maize (rainy season), berseem (winter season) and jowar (summer season) by the fodder growers of different size of farm.

5.1 Cost of Cultivation:

The cost of cultivation incurred in cultivation of major crops viz. maize (rainy season), berseem (winter season) and jowar (summer season) by the fodder growers of different size of farm was analysed to compared the profitability of crops and find out the share of different input in the total cost cultivation and presented in this sub head.

5.1.1 Maize :

Maize is found to be a major fodder crop cultivated by the majority of fodder growers in the rainy season. The comparative picture of cost of cultivation (Rs. /ha) of maize fodder in different size of farms was analyzed and observed that an average fodder grower invested Rs. 9264.64 /ha in the cultivation of maize and as the size of farm increased from the cost of cultivation of maize found to be increased. Rs.7782.15/ha (marginal) to Rs. 11092.95 /ha (large) (Table 5.1.1). The Farm Yard Manure (37%), Machine labor (16%), Seed (13%), Chemical fertilizer (12%), Hired human Labour (10%) and Family Labour (7%) were found to be major components (Fig.5.1) of cost of cultivation of maize in the area under study.

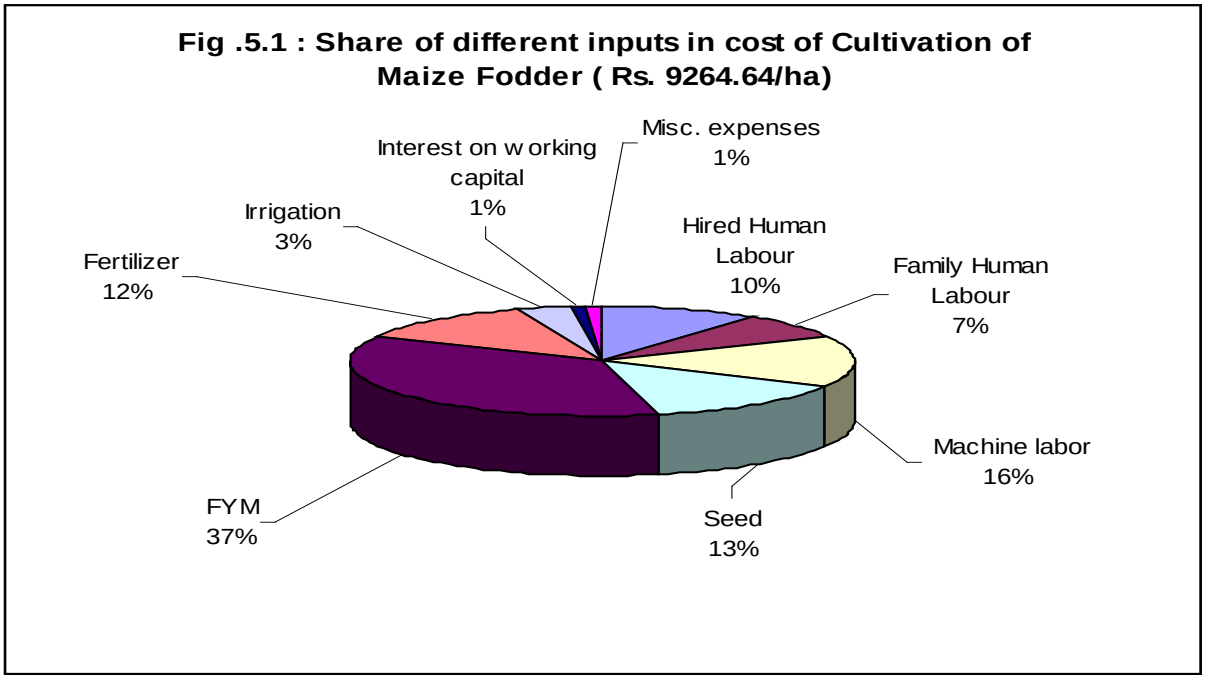


Table 5.1.1: Operational Cost of cultivation of Fodder crop Maize Chari of Sampled Respondents in M.P.

(Rs/ha)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Overall
1. Human labor						
i) Hired Human Labour	67.80	94.80	1532.80	1542.40	1557.45	959.05
ii) Family Human Labour	1447.80	1472.95	117.80	124.80	134.35	659.54
2. Machine labor	1332.40	1376.15	1431.40	1492.90	1506.30	1427.83
3. Seed	1021.30	1075.00	1147.80	1450.00	1510.00	1240.82
4. FYM	2617.50	2946.10	3111.00	3851.25	4252.50	3355.67
5. Fertilizer	905.60	971.10	995.00	1237.50	1487.75	1119.39
6. Plant protection measures	0.00	0.00	0.00	0.00	0.00	0.00
7. Irrigation	235.00	245.00	333.90	356.00	430.00	319.98
8. Interest on working capital	58.65	62.85	66.60	76.90	83.15	69.63
9. Misc. expenses	96.10	101.10	111.25	123.75	131.45	112.73
Total variable cost	7782.15	8345.05	8847.55	10255.50	11092.95	9264.64

5.1.2 Berseem :

Berseem is found to be a major fodder crop cultivated by the majority of fodder growers in the winter season. The comparative picture of cost of cultivation (Rs. /ha) of berseem fodder in different size of farms was analyzed and observed that an average

fodder grower invested Rs. 13835.66 /ha in the cultivation of berseem and as the size of farm increased from the cost of cultivation of berseem increased Rs.12716.60/ha (marginal) to Rs. 15159.90 /ha (large) (Table 5.1.2). The Farm Yard Manure (33%), Seed (26%), Machine labor (11%), Irrigation (9%), Chemical fertilizer (8%), Hired human Labour (7%) and Family Labour (4%) were found to be main component(Fig.5.2) of cost of cultivation of berseem the area under study.

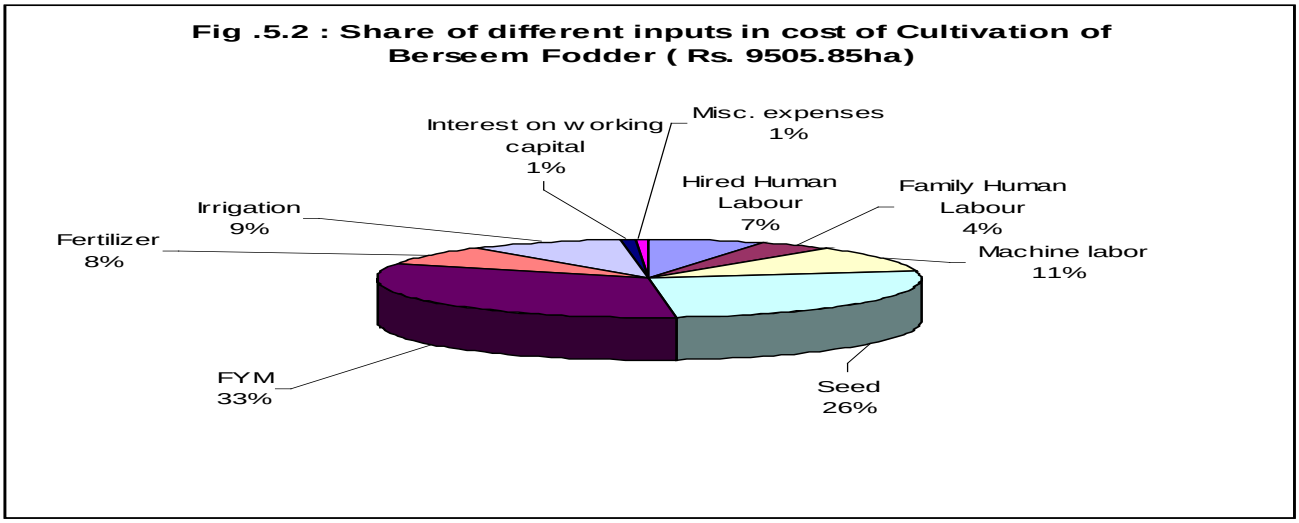


Table 5.1.2: Operational Cost of cultivation of Berseem Fodder crop (Rabi), of Sampled Respondents in M.P.

(Rs/ha)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Overall
1. Human labor						
i) Hired	0.00	0.00	1582.80	1592.40	1607.45	956.53
ii) Family	1497.80	1522.95	0.00	0.00	0.00	604.15
2. Machine labor	1382.40	1426.15	1486.40	1507.90	1516.30	1463.83
3. Seed	3281.15	3446.20	3567.95	3982.80	4031.40	3661.90
4. FYM	4166.30	4281.30	4531.15	4642.85	4987.45	4521.81
5. Fertilizer	896.40	984.65	1031.40	1296.30	1506.15	1142.98
6. Plant protection measures	0.00	0.00	0.00	0.00	0.00	0.00
7. Irrigation	1281.15	1246.30	1246.35	1241.30	1266.30	1256.28
8. Interest on working capital	95.10	98.20	102.30	108.45	113.40	103.49
9. Misc. expenses	116.30	122.80	124.80	128.10	131.45	124.69
Total variable cost	12716.60	13128.55	13673.15	14500.10	15159.90	13835.66

5.1.3 Jowar :

Jowar is found to be a major fodder crop cultivated by the majority of fodder growers in the summer season. The comparative picture of cost of cultivation (Rs. /ha) of jowar fodder in different size of farms was analyzed and observed that an average fodder grower invested Rs. 9264.64 /ha in the cultivation of jowar and as the size of farm increased the cost of cultivation of maize increased from Rs.7782.15/ha (marginal) to Rs. 11092.95 /ha (large) (Table 5.1.3). The Farm Yard Manure (32%), Machine labor (16%), Seed (11%), Hired human Labour (11%), Chemical fertilizer (10%), Irrigation (9%), and Family Labour (8%) were found to be main components (Fig.5.3) of cost of cultivation of maize the area under study.

Fig .5.3 : Share of different inputs in cost of Cultivation of Jowar Fodder (Rs. 9505.85ha)

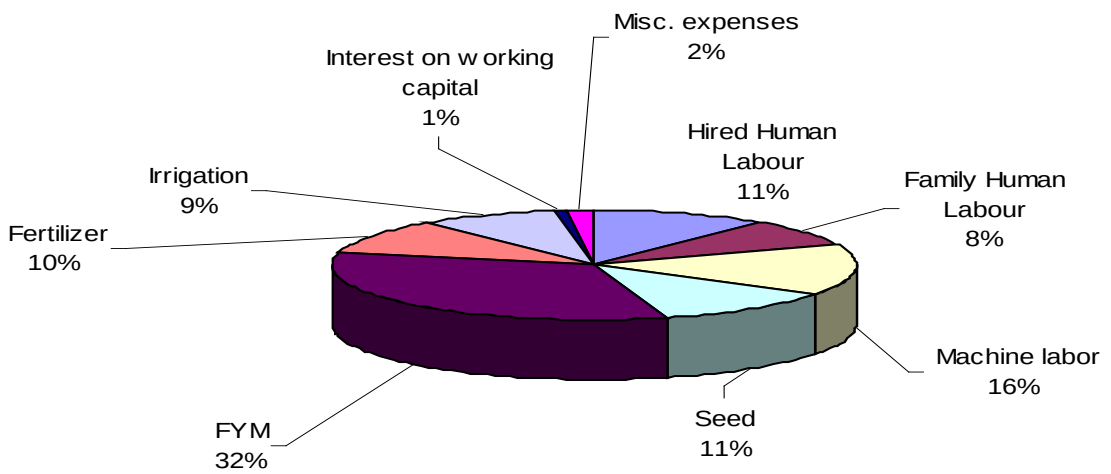


Table 5.1.3: Operational Cost of cultivation of Fodder crop Jowar Chari of Sampled Respondents in M.P.

(Rs/ha)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Overall
1. Human labor						
i) Hired	82.80	99.80	1632.80	1642.40	1657.45	1023.05
ii) Family	1497.80	1522.95	167.80	224.80	284.35	739.54
2. Machine labor	1432.40	1476.15	1481.40	1542.90	1556.30	1497.83
3. Seed	771.30	984.30	1054.45	1234.35	1337.45	1076.37
4. FYM	2517.50	2846.10	2996.00	3491.25	3797.50	3129.67
5. Fertilizer	855.60	921.10	845.00	1137.50	1137.75	979.39
6. Plant protection measures	0.00	0.00	0.00	0.00	0.00	0.00
7. Irrigation	735.00	745.00	833.90	856.00	930.00	819.98
8. Interest on working capital	60.75	66.05	69.20	77.85	82.60	71.29
9. Misc. expenses	146.10	146.10	146.25	173.75	231.45	168.73
Total variable cost	8099.25	8807.55	9226.80	10380.80	11014.85	9505.85

5.2 Economics of Fodder Crops:

The comparative picture of economics of different fodder crops viz. maize (rainy season), berseem (winter season) and jowar (summer season) grown by the fodder growers related to different size of farms were analysed and presented in Table 5.2. It is observed from the data that there was found no competition of fodder crops with other crops in the area under study. An average fodder grower of the Madhya Pradesh devoted their 1 – 2 Bigha area of cultivated land in the production of fodders in all the season of the year. The comparative picture of fodder crops showed that the cultivation of beseem was found be more profitable in the area under study in which an average fodder grower invested Rs.13835.66/ha and received Rs. 52521.47/ha revealed that on the investment of Rs. 1.00, he got Rs. 3.80 as benefit over the variable cost, while he received only Rs. 1.80 and 1.69 on investment of Rs. 1.00 respectively from the cultivation of maize and jowar. He also got maximum net return from the cultivation of berseem (Rs. 52521.47/ha) as compared to cultivation of maize (Rs.16664.92/ha) and jowar (Rs. 16092/ha). (Fig. 5.4)It is also observed from the data that as the size of farm increases the cost of cultivation, gross profit, net profit increases. (Table 5.2).

Fig 5.4 : Cost Incurred & Returns obatined by an average fodder grower

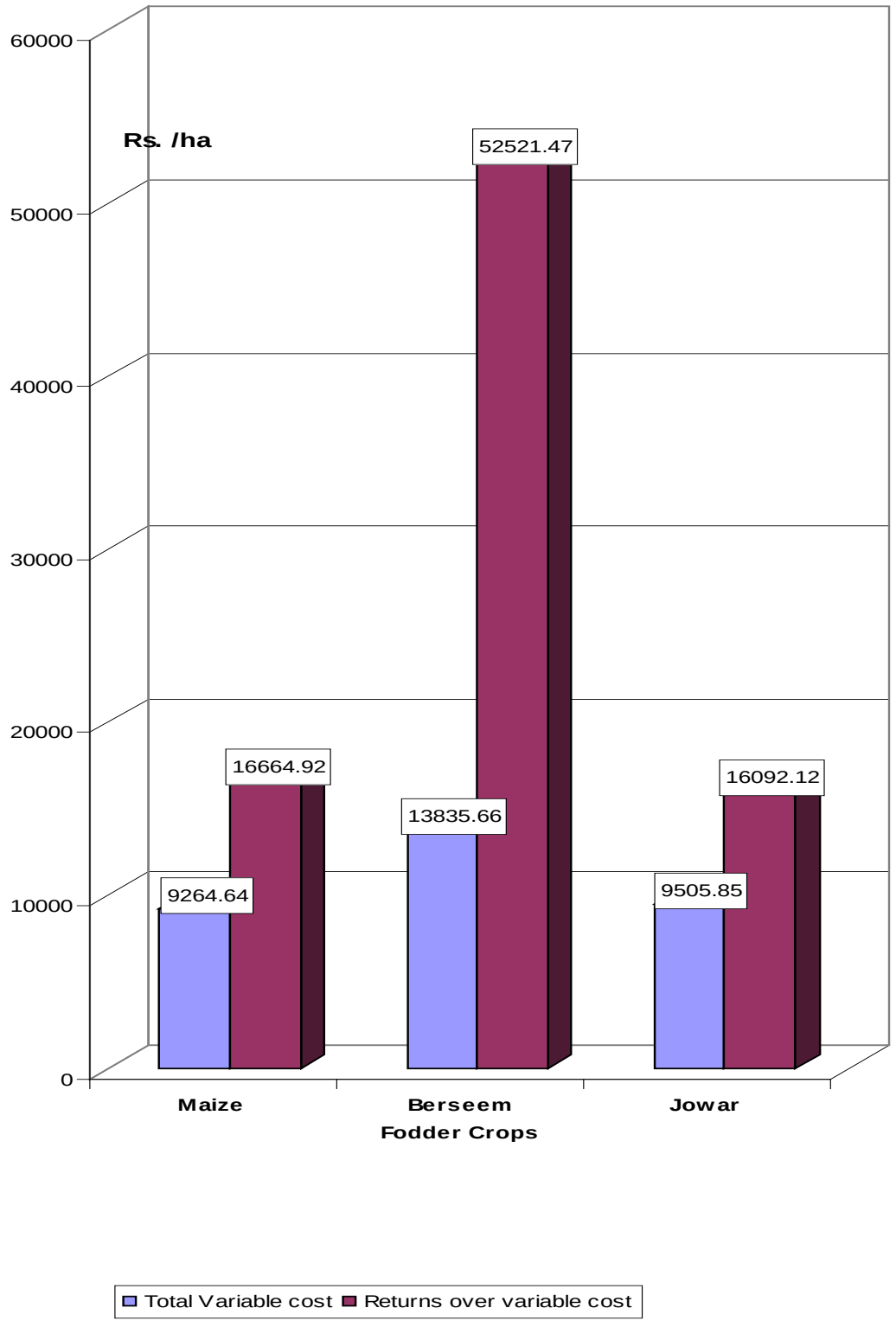


Table 5.2: Economics of fodder crops vis-à-vis competing crops of Sample Respondents in M.P.

(Rs./ha.)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Overall
Kharif fodder : Maize Chari						
Yield(qtls/ha)	238.40	258.45	271.85	284.45	293.70	269.37
Price(Rs/qtls)	96.26	96.26	96.26	96.26	96.26	96.26
Gross returns	22948.38	24878.40	26168.28	27381.16	28271.56	25929.56
Total Variable cost	7782.15	8345.05	8847.55	10255.50	11092.95	9264.64
Returns over variable cost	15166.23	16533.35	17320.73	17125.66	17178.61	16664.92
Competing crop during Kharif season						
Yield(qtls/ha)	0.00	0.00	0.00	0.00	0.00	0.00
Price(Rs/qtls)	0.00	0.00	0.00	0.00	0.00	0.00
Gross returns	0.00	0.00	0.00	0.00	0.00	0.00
Total Variable cost	0.00	0.00	0.00	0.00	0.00	0.00
Returns over variable cost	0.00	0.00	0.00	0.00	0.00	0.00
Rabi fodder : Berseem						
Yield(qtls/ha)	532.56	596.41	674.23	689.23	756.23	649.73
Price(Rs/qtls)	102.13	102.13	102.13	102.13	102.13	102.13
Gross returns	54390.35	60911.35	68859.11	70391.06	77233.77	66357.13
Total Variable cost	12716.60	13128.55	13673.15	14500.10	15159.90	13835.66
Returns over variable cost	41673.75	47782.80	55185.96	55890.96	62073.87	52521.47
Competing crop during rabi season						
Yield(qtls/ha)	0.00	0.00	0.00	0.00	0.00	0.00
Price(Rs/qtls)	0.00	0.00	0.00	0.00	0.00	0.00
Gross returns	0.00	0.00	0.00	0.00	0.00	0.00
Total Variable cost	0.00	0.00	0.00	0.00	0.00	0.00
Returns over variable cost	0.00	0.00	0.00	0.00	0.00	0.00
Summer fodder : Juar Chari						
Yield(qtls/ha)	218.40	228.45	261.85	274.45	283.70	253.37
Price(Rs/qtls)	101.03	101.03	101.03	101.03	101.03	101.03
Gross returns	22064.95	23080.30	26454.71	27727.68	28662.21	25597.97
Total Variable cost	8099.25	8807.55	9226.80	10380.80	11014.85	9505.85
Returns over variable cost	13965.70	14272.75	17227.91	17346.88	17647.36	16092.12
Competing crop during summer season						
Yield(qtls/ha)	0.00	0.00	0.00	0.00	0.00	0.00
Price(Rs/qtls)	0.00	0.00	0.00	0.00	0.00	0.00
Gross returns	0.00	0.00	0.00	0.00	0.00	0.00
Total Variable cost	0.00	0.00	0.00	0.00	0.00	0.00
Returns over variable cost	0.00	0.00	0.00	0.00	0.00	0.00

.....

CHAPTER – VI

PROCESSING AND MARKETING SYSTEM FOR FODDER CROPS

The fodder cultivation in the study area is found not to be runs on the commercial line. None of the respondent of the study area found to be involved in the processing (hay and silage making) and marketing of fodder in M.P.

.....

CHAPTER –VII

PROBLEMS FACED BY GROWERS OF FODDER CROPS

The various problems which were faced by the fodder growers in the cultivation of major crops viz. maize (kharif), berseem (rabi) and Jowar (summer) are summarized in this chapter and presented in Table 7.1. It is observed from the data that lack of technical know how (76.66%) was found to be the biggest problem observed during the course of investigation and reported by the maximum numbers of respondents in the area under study. The inferior quality of seed (74.00%), faulty input delivery system (74.00%), high expenditure in production due power cuts (74.00%), non availability of skilled labour in time and high cost of labour (68.00%), faulty government policy as distribution of mini kits of fodder seeds from veterinary department instead of agriculture department (52%) were the other major problems found in the study area reported by the majority of the respondents in production of maize fodder . These problems are found to be same for all the selected crops and of all fodder growers belong to the different categories of farms with minor difference. (Table 7.1)

Table 7.1 Problems related to the production of fodder crops, sample households, 2008-09, Madhya Pradesh

(% multiple response)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Overall
Kharif fodder: Maize						
1. Seed Quality	83.33	80.00	60.00	70.00	76.66	74.00
2. Input delivery	96.66	83.33	76.66	60.00	53.33	74.00
3. Expenditure on production	70.00	76.66	83.33	80.00	73.33	76.66
4. Insect-pests and diseases	10.00	6.66	13.33	16.66	20.00	13.33
5. Technical knowledge	83.33	80.00	60.00	70.00	76.66	74.00
6. Access to credit	6.66	13.33	16.66	20.00	80.00	27.33
7. Availability and cost of labour	83.33	76.66	60.00	60.00	60.00	68.00
8.Government Policies	13.33	16.66	70.00	76.66	83.33	52.00
Rabi fodder : Berseem						
1. Seed Quality	83.33	80.00	90.00	93.33	96.67	88.67
2. Input delivery	60.00	63.33	56.67	70.00	76.67	65.33
3. Expenditure on production	60.00	56.67	53.33	50.00	46.67	53.33
4. Insect-pests and diseases	16.66	13.33	10.00	6.66	3.33	10.00
5. Technical knowledge	90.00	80.00	76.67	60.00	56.67	72.67
6. Access to credit	13.33	10.00	16.66	13.33	3.33	11.33
7. Availability and cost of labour	3.33	3.33	63.33	53.33	60.00	36.66
8. Government Polices	16.67	13.33	63.33	66.67	70.00	46.00
Summer fodder : Jowar						
1. Seed Quality	80.00	70.00	66.67	60.00	56.67	66.67
2. Input delivery	76.67	70.00	63.33	56.67	60.00	65.33
3. Expenditure on production	50.00	53.33	56.67	60.00	46.67	53.33
4. Insect-pests and diseases	3.33	6.66	13.33	16.66	16.66	11.33
5. Technical knowledge	90.00	80.00	76.67	60.00	56.67	72.67
6. Access to credit	10.00	10.00	13.33	16.66	3.33	10.66
7. Availability and cost of labour	6.66	10.00	76.67	56.67	46.66	39.33
8. Government Polices	16.67	13.33	63.33	66.67	70.00	46.00

.....

CHAPTER-VIII

SUMMARY AND CONCLUSIONS

Livestock production is backbone of Indian Agriculture and source of employment in rural areas for centuries. This sector has been the primary source of energy for agriculture operation and major source of animal protein for the masses. Therefore India has been house to major draught, milch and dual-purpose breeds of cattle. Our whole system of rural economy has revolved around livestock production.

Madhya Pradesh is basically an agricultural state and about 70 per cent of its people live in villages. Their livelihood is dependent mainly on agriculture and animal husbandry. Though state has a huge livestock population of over 4162.96 millions, besides poultry, yet the production of milk and other livestock products is about the lowest in India. In the state, the people are highly deficient in various cattle products, though about one-fourth of the total cattle population of India. As against the minimum nutritional requirement of 201 g/head/day of milk set by the nutritionists, the availability is 100 g/head/day only. One of the main reasons for the low productivity of livestock is malnutrition, under-nutrition or both, besides the low genetic potential of the animals. In fact, the economic viability of livestock husbandry depends on sources of feed and fodder as feeding cost constitutes about 65 - 70 per cent of the total cost of livestock farming. The feed given to cattle comprises of dry fodder, green fodder and concentrates of which dry fodder forms the major share. The adequate supply of feed and fodder is a critical factor affecting performance of animals. This fact is adequately supported by the figures of availability, *vis-à-vis* the requirement of green-fodder crops, crop residues and concentrates, which shows that there is a huge gap of between demand and supply of all kinds of these feeds and fodders, in the state.

The cost production of milk increased day by day and in the production cost of milk , 60 percent cost was incurred of the green fodder , If the cost of production of green fodder decreases it also decreases the cost of milk production Hence, looking to the above points in consideration present study was formulated to study the growth of live stock and fodder crops respectively reared and cultivated by the farmers in different districts of Madhya Pradesh and to examined the present status of live stock and fodder

crops, profitability, processing and marketing, and the problems related to production and marketing of these crops in M.P.

The study is confined to the 3 districts i.e. Rajgarh (8.93%), Shajapur (8.51%), and Ujjain (6.69%) has been selected purposively for the study on the basis of highest area in fodder cultivation in M.P. (569987 ha).Amongst the selected districts, two blocks from each district, one block near and one distant to the periphery of district headquarter has been selected randomly to realize the effect of distance factor in the findings. From each block, a cluster of 3 villages has been randomly chosen. Finally, a sample of 25 farmers was selected randomly from each selected cluster, spreading over various farm size categories i.e., marginal (less than one hectare), small (1-2 hectares), semi-medium (2-4 hectares), medium (4-10 hectares) and large (more than 10 hectares) based on the size of the operational holding, making a total sample of 150 farmers. The primary data collections were done by the personal interview method for the reference year 2008-09.The secondary data has also been collected for live stock population (1992-2007) and fodder crops grown (1991-2009) in different districts of M.P.

The following findings and conclusions were brought from the study

1. The livestock populating in Madhya Pradesh showed increasing trend over the years. The total livestock population found to be increased by 28.49 per cent in the year 2007 as compare to the year 1992 (32400.06 thousand) with the annual growth of 8.3 per cent per annum. As regards to the population of different livestock is concerned the population of cattle, buffalo and goat found to be increased with growth of 2.03 per cent, 21.63 per cent 15.51 per cent per annum, while the population of horse and pony (-32.34%/year), donkey (-28.91%/year), sheep (-14.91%/year), camel (-26.89%/year) and mule (-50.19%/year) showed negative growth rates over the years. Among the different livestock, the population of buffaloes (21.63% /year) showed maximum annual growth rates followed by goat (15.51%/year) and cattle (2.53%/year).
2. The total population livestock found to be increased over the period of time in all the district of Madhya Pradesh except Jabalpur (-2.51%/year). The maximum annual growth rate of population of livestock was found to be in Mandla district (24.84%/year) followed by Datia (21.83%/year), Rajgarh (20.81%/year), Dhar (15.19 %/year), Tikamgarh (14.02 %/year), Ujjain (12.09%/year), Jhabua 11.69%/year) and Vidisha (11.54%/year). Apart from these districts the growth of

total livestock was also found to be more than the Madhya Pradesh in Sidhi, Ratlam, Shajapur, Shivpuri and Guna District.

3. Fodder cultivation is found to be in a nascent stage in Madhya Pradesh. The cultivators of Madhya Pradesh devoted only their 3 per cent of gross cropped area under fodder. Out of the total fodder area (0.74 lakh ha), the cultivators of Madhya Pradesh devoted their maximum area under the cultivation of bajra (20%) followed by Jowar (4%), Berseem (2%) and Maize (1%). The 72% of the fodder area is found to be covered under unidentified other fodder crops. Although, the Bajra which was highly cultivated by the cultivators, but it was mainly cultivated for grain purposes rather than fodder. The by-product of this crop is used as a fodder for the live stock. Thus, jowar, berseem and maize were found to be major fodder crops in the state.
4. The area of all the fodder crops was found to be decreased by 1.97 per cent per year during the last 20 years. The growth of these fodders was found to be more in the period I (2.52%/year) as compared to period II (-2.40%/year).
5. None of fodder grower had chaff cutter for fodder cutting in their farm. This denoted that fodder grower of the study area not done milk production at commercial line. They only grow fodder for fulfilling the daily requirement of their few cattle and buffaloes. The majority of live stock found in the study area of local breed and they grow fodder for them in little quantity. The quality aspects of fodder were also found to be ignored by them. Their farm development and machinery and equipment are found neither to be tuned with fodder production nor to milk production.
6. The size of farms increases the number of cross breed cattles, buffaloes were found to be increased, while the numbers of goats were found to be decreased. The indigenous cattles of different types were found to be remained same in all the groups of farms. The present value of cross breed cattle’s and buffaloes were found to be almost double as compared to indigenous cattles.
7. Irrespective to the season the fodder grower devoted their 1.53 per cent (large) to 1.26 per cent (marginal) of gross cropped area in the cultivation of fodder and 70 per cent of fodder growers of different size of farms reported that their area under fodder was remained same as compared to last 10 years. They devoted same area of land under different seasons of fodder as they were devotes before last 10 year. Although 48 per cent of them reported that the production under fodder was

increased as compared to last 10 years, while about 40 percent of fodder growers reported that they harvested same produce as they harvested 10 year before. This was might be due to the lack of extension activities (technical know-how to cultivation) of fodder crops at their field. As there was found the less of coordination between the department of agriculture and animal husbandry in the area under study during the course of investigation.

8. The majority of fodder growers (above 80 %) of different size of farms reported that the productivity of fodder was increased as compared to last 10 years, this was might be due to the introduction of new high yielding varieties of fodder in the study area.
9. The population of cattles and male buffaloe were found to be decreased as compared to last 10 years while the population of female buffalo and goat was respectively decreased and remain same
10. The milk yield of female cattle (cows) decreases as compared to 10 years before in the area under study, while the milk yield of buffaloes was found to be increased. The more than the 70 per cent of fodder growers reported that the goat meat yield was remained same as compared to 10 years before. Therefore, it is concluded that the milk yield of cows was found to be decreased as compared to last 10 years while the milk yield of female buffaloes were found to increased. The goat meat yield was found to be remained same during the last 10 years.
11. The more than 60 per cent of fodder growers reported that they adopted stall feeding for the cattles and buffaloes instead of grazing
12. An average fodder growers feed an indigenous in milk cow with 12.86 kg. maize fodder, 2.66 kg. of wheat straw and 1.58 kg. oil cake/ day in the rainy season while they fed 12.30 kg berseem, 1.19 kg. soybean straw and 1.88 kg. oil cake/ day in the winter season. In the summer season they feed their indigenous cow with 7.36 kg. of jowar 1.49 kg. of wheat straw and 1.99 kg. of oil/ day cake. The difference of 2 kg + was observed in case of cross breed and buffaloes' in milk, while absence of oil cake and chuni was observed in case of dry animals.
13. There was found no competition of fodder crops with other crops in the area under study. An average fodder grower of the Madhya Pradesh devoted their 1 – 2 Bigha area of cultivated land in the production of fodders in all the season of the year. The cultivation of beseem was found be more profitable in the area under study in which an average fodder grower invested only Rs.13835.66/ha and received Rs.

52521.47/ha revealed that on the investment of Rs. 1.00, he got Rs. 3.80 as benefit over the variable cost, while he received only Rs. 1.80 and 1.69 on investment of Rs. 1.00 respectively from the cultivation of maize and jowar. He also got maximum net return from the cultivation of berseem (Rs. 52521.47/ha) as compared to cultivation of maize (Rs.16664.92/ha) and jowar (Rs. 16092/ha). (Fig. 5.4) and as the size of farm increased the cost of cultivation of fodder crops, gross profit, net profit increases from the fodder.

14. The fodder cultivation in the study area is found not to be runs on the commercial line. None of the respondent of the study area found to be involved in the processing (Hay and Silage making) and marketing of fodder in M.P.

15. The lack of technical know how (76.66%) was found to be the biggest problem observed during the course of investigation and reported by the maximum numbers of respondents in the area under study. The inferior quality of seed (74.00%), faulty input delivery system (74.00%), high expenditure in production due power cuts (74.00%), non availability of skilled labour in time and high cost of labour (68.00%), faulty government policy as distribution of mini kits of fodder seeds from veterinary department instead of agriculture department (52%) were the other major problems found in the study area reported by the majority of the respondents in production of maize fodder

Hence, it is clear that the fodder cultivation was not shown too much progress in the state since 1990. The cultivator still growing fodder in the line of crop cultivation and the majority of them were not known the recommended package of practices of fodder cultivation. The fodder growers were also found to be not doing fodder preservation techniques viz. hay and silage making for the lean period. They were not cultivating fodder in commercial line as none of them involved in marketing of fodder in the state.

Hence, it is the right time that state government re-intensified their efforts in progress of fodder in the state because without introducing dairy based faming system approach on the farmers' farm, their income of farmer should not became double, which is the ultimate target of the state government. It is only activity which was done by the farmers since long time. It not only generated income but also enhanced employment at their owned farm. The mini kit of fodder crops were found to be distributed by the animal husbandry department and they were not taking interest in the extension activities concern to the fodder, due to lack of training in it and it lacks the aura of being doctor and the fodder is more inclined towards agriculture. The animal husbandry department in the state is only

concerned with the treatment aspect and improvement of breeds because here lays the money. Investing interest in fodder sector will benefit the live stock owners but who cares?

Hence, there is urgent need to create the a separate department for fodder development separate from animal husbandry department or merge the fodder development sector in agriculture / horticulture department for better extension activities and distribution of fodder min kits with technical know-how because the cultivation of fodder is more or less similar to the cultivation of crops and vegetable.

……