

**LIVESTOCK COMBINATION REGION IN JAIPUR DISTRICT, RAJASTHAN****Anju Ojha**

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**Abstract:** *The livestock sector is an integral part of India's agriculture and an important part of the whole economy with reference to employment, income and earning of foreign exchange for the country. The growth of dairy industry with the milk production increasing to more than triple in the last few decades has been a commendable achievement and is well recognized. Despite scientific and technological advancement in mechanical farming large numbers of agricultural operations continue to depend on bullocks and buffaloes for draught power and dung for organic manure and fuel, supporting the farming community having small and marginal land holdings. The paper discusses a few examples of livestock combination region of Jaipur district. The study was carried out in order to understand production systems and to assess the need, priorities and scope for development interventions. The combination of livestock cows, buffalo and goats is common. Each of these is adopted with a multi-purpose objective.*

**Keywords:** Livestock, Combination, Production System, Crop Combination.

**Introduction**

Keeping livestock is traditional and closely linked to rural culture, indicative of the fact that rural families have always realised the importance of livestock and clear evidence is available in literature, art and ancient epics dating back to 4000 B.C. or maybe even earlier (Rangnekar 1995, Dolberg 1982). The foremost environmental challenge faced by the world is climate change. All the sectors and societies of world are vulnerable to climate change. But, the developing regions which are scarce on resources and the sectors like agriculture, which are primarily dependent on climate, are among the most vulnerable group. Rajasthan, largest state of India is among the resource scarce regions, although the state is house of many important minerals but lacks in basic resources like fertile land and water resources. The crop combination regions have been studied from time to time again and again by geographers and agricultural and use planners. But evidences for livestock combination regions are almost non-existent except those (Singh, 1976) who studied the livestock combination regions for Haryana on the theoretical basis. Two different approaches are generally applied for delineation of crop combination regions based on arbitrary choice of crops etc. i.e. First crop only, first two crops only, first three crops etc. and development of crop combination regions in terms of variables based on some theoretical techniques which are considered to be more accurate, scientific and widely acceptable. Here, an attempt has been made to delineate the livestock combination region in Rajasthan based on the statistical the group of significant function (Mahmood, 1977).

Rajasthan is among the leading producers of mustard, pearl millet, cumin, coriander and fenugreek (Swain, Kalamkar and Ojha, 2012) which shows the importance of the state in Indian agriculture. The heavy dependence of agriculture in Rajasthan on monsoon rainfall makes it more vulnerable towards the phenomenon of climate change (Singh, 1994; Singh and Kumar, 2013). Agriculture, including animal husbandry, contributed just 24.59 per cent to the State Gross Domestic Product (GDP) during 2012-13 (Directorate of Economics and Statistics, 2013). The agriculture practices in Rajasthan are very tough due to the harsh dry climate found in majority of the state (Chand and Raju, 2009). The state's economy has undergone a considerable transformation in the recent past with growth of manufacturing and services sectors. However, agriculture, with 64.2 per cent of total rural working population is directly dependent on agriculture as cultivators and agriculture labours (Census of India, 2011), continues to play an important role. The low literacy of 61.4 percent (Census of India, 2011) found among the rural community of Rajasthan is the foremost social reasons for agriculture vulnerability. Agriculture in Rajasthan

faces land scarcity not only due to unfavourable topography but also due to competition from industrial sector. Growth of the agriculture sector, therefore, has an important impact on the lives of people dependent on agriculture. According to the Planning Department (2012), the challenges faced by the agriculture sector in Rajasthan are increasing gap between demand and availability of water, scanty and uncertain rainfall, deteriorating quality of land and underground water, low value agriculture, large gap between potential and realized yield of crops and high inter-year variation in productivity, low share of vegetable and fruit crops, seed spices and medicinal plants, etc. The vulnerability of agriculture sector increases with changing environmental and socio-economic conditions (Singh, 2000).

### Physical Set-Up

Jaipur is situated in the eastern part of Rajasthan, surrounded on three sides by the rugged Aravalli hills. It is surrounded by Alwar and Sikar in the North; by Sikar, Nagaur and Ajmer in West; by Ajmer, Tonk and Sawai Madhopur in the South and by Dausa and Bharatpur districts in East. It has an average elevation of 430 meters. Jaipur was founded in 1728 A.D. Maharaja Jai Singh was the founder of Jaipur city which is famous for its wonderful architectural planning. The city has many historical monuments and buildings even as on today. The climate of Jaipur city is semi-arid and average rainfall per year is 556.4 mm. The rainy season lasts from June to September. The dry bulb temperature lies between 45° C to 25° C in summer and 22° C to 8° C in winter. The city is renowned for heritage and its color symmetry and thus known as the pink city. According to the census 2011, Jaipur district has a population of 6,663,971, which gives it a ranking of 10th most populous district in India. The district has a population density of 598 persons per square kilometer and a population growth rate of 26.91 percent in the decade 2001-2011. The gender ratio of this district is 909 females for every 1000 males and a literacy ratio of 76.44 percent. As of 2011, Jaipur has a population of 3,073,350. The Population of the Jaipur Metropolitan area is 3,646,590. (Figure 01)

Jaipur district in Rajasthan lies between north latitudes 26° 43' to 28° 30" and east longitudes between 74° 60' to 77° 18' covering a geographical area of 11,117 km<sup>2</sup>. It is bounded in the north by the State of Haryana as well as by Sikar district of Rajasthan, in the south by Tonk district, on the western borders by the districts of Ajmer and Nagaur and on its eastern boundaries lies Alwar and Dausa districts. The district occupies an area of 11143 km<sup>2</sup> which is 3.26 percent to the total area of the state.

**Figure 01: Key Map**



## Material and Method

Commensurate with the objective of the study, all the 13 tehsils of Jaipur District were considered. The data pertaining to livestock census of Jaipur District of year i.e. 2012 were considered to examine the livestock combination in Jaipur District. In the order to determine some sharp-cut off points, for delineation of crop combination regions, the geographer have applied different statistical techniques and suitably modified time to time. An important formula given by Weaver (1954) while studying the livestock combination region in the Middle West. Let  $d_1, d_2, \dots, d_n$  be the deviations (Plus or minus) of the actual percentages from any one of theoretical values. These deviations, for every set of livestock are squared and summed. Each sum is divided by number of livestock. The square root of this will give us a measure of deviation of the concerned livestock combination from the theoretical, calling this  $\delta$  we have

$$\delta = \frac{\sum d^2}{n}$$

Where  $\sum d^2$  is the sum of square of individual deviations and  $n$  is the number of livestock being considered, the combination with least or smallest value of  $\delta$  will be combination to be selected. Weaver's method to determine the minimum deviations appears to be quite simple, but in practice, it requires much calculation. Occasionally, it also tends to produce highly generalized result in areas of large, although not vary enough to justify the combination and the remaining livestock are comparatively small.

## Results and Discussion

The total livestock population of the district during 2012 was 2.8 million (Anon. 2016). Of this cattle population constitute 22.82 percent, buffalos' 38.57 percent, goat 30.08 percent, sheep 8.26 percent and camel 0.18 percent respectively. Cattle are dominantly found in Phulera, Chomu and Amer tehsils, buffaloes in Kotputali and Amer, goat in Phulera and sheep in Mauzamabad and Phagi tehsils respectively. Tehsil wise distribution of livestock population is given in table 1 and percent to total livestock population in table 2. Livestock combination region for Jaipur District were delineated by above method and result are set out in table 3. From the table 3 it is revealed the one livestock combination was not found in any tehsil. However, there are three tehsils namely Jamwa Ramgarh, Shahpura and Viratnagar in which 2- livestock combination is formed during the year 2012. 3- livestock combination was observed in six tehsils namely Aamer, Bassi, Chaksu, Chomu, Jaipur and Sanganer whereas 4-livestock combination has been observed in Mauzamabad, Phagi and Phulera tehsils and 6-livestock combination in only one tehsil viz. Kotputli in the year 2012.

**Table 01: Tehsil wise distribution of Livestock Wealth in Jaipur district (2012)**

Tehsil	Cattle	Buffalo	Goat	Sheep	Camels	Pack Animals
Amer	98933	119661	73097	7470	236	109
Bassi	68898	79180	64346	5456	459	234
Chaksu	32520	58865	46991	17371	344	113
Chomu	93656	117505	55075	3090	147	151
Mauzamabad	43378	61379	66052	56477	78	236
Jaipur	43830	55213	21585	4727	145	181
Jamwa Ramgarh	37234	82043	106580	4343	403	91
Kotputli	17166	149476	42465	12819	1108	578
Phagi	27577	55659	45881	30664	205	49
Phulera	105144	112764	177031	70574	964	408
Sanganer	35664	58839	28859	8366	291	160
Shahapura	20720	80077	63939	6653	393	174
Viratnagar	10221	42725	45193	1938	123	45
Total	634941	1073386	837094	229948	4896	2529

Source: District Statistical Abstract, 2016

**Table 02: Tehsil wise percentage of Livestock in Jaipur district (2012)**

Tehsil	Cattle	Buffalo	Goat	Sheep	Camels	Pack Animals
Amer	33.03	39.95	24.41	2.49	0.08	0.04
Bassi	31.52	36.23	29.44	2.50	0.20	0.11
Chaksu	20.82	37.69	30.08	11.12	0.22	0.07
Chomu	34.74	43.58	20.43	1.15	0.05	0.05
Mauzamabad	19.06	26.97	29.02	24.82	0.03	0.10
Jaipur	34.87	43.93	17.18	3.76	0.12	0.14
Jamwa Ramgarh	16.14	35.57	46.20	1.88	0.17	0.04
Kotputli	7.68	66.85	18.99	5.73	0.49	0.26
Phagi	17.23	34.78	28.67	19.16	0.13	0.03
Phulera	22.52	24.15	37.92	15.12	0.21	0.08
Sanganer	26.99	44.51	21.83	6.33	0.22	0.12
Shahapura	12.05	46.57	37.18	3.87	0.23	0.10
Viratnagar	10.20	42.62	45.09	1.93	0.12	0.04
Total	22.82	38.57	30.08	8.26	0.18	0.09

Source: Calculated from District Statistical Abstract, 2016

**Table 03: Classification of Livestock Combination Regions in Jaipur district by Weaver's Method (Calculating value of  $\delta$ )**

#	Tehsil	Livestock Combination Region
1	Amer	B-C-G
2	Bassi	B-C-G
3	Chaksu	B-G-C
4	Chomu	B-C-G
5	Mauzamabad	G-B-S-C
6	Jaipur	B-C-G
7	Jamwa Ramgarh	G-B
8	Kotputli	B-G-C-S-Ca-P
9	Phagi	B-G-S-C
10	Phulera	G-B-C-S
11	Sanganer	B-C-G
12	Shahapura	B-G
13	Viratnagar	G-B

Source: Calculated from District Statistical Abstract, 2016

The study revealed that livestock combination region No.1(Goat- Buffalo, Buffalo-Goat) was found in only three tehsils namely Jamwa Ramgarh, Shahapura and Viratnagar. However, there are six tehsils namely Amer, Bassi, Chaksu, Chomu, Jaipur and Sanganer in which livestock combination No. 2 (Buffalo-Cattle- Goat, Buffalo- Goat- Cattle) is found during the year 2012. Livestock combination No. 3(Goat- Buffalo-Sheep- Cattle, Buffalo- Goat-Sheep-Cattle, Goat-Buffalo-Cattle-Sheep) was observed in three tehsils viz. Mauzamabad, Phagi and Phulera. During the year 2012 the livestock combination No. 4 (Buffalo- Goat-Cattle-Sheep-Camel- Pack Animal) was found only in one tehsil namely Kotputli. Distribution of tehsil wise livestock combination regions are given in table 3.

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