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An Inter-Regional Analysis of Livestock in Rajasthan

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Abstract: *Cattle's rearing is believed to be among the first steps of primitive man towards civilization. Livestock has been played a crucial role in the development and progress of mankind. It has provided human beings with clothing and nutrition besides helping in transport and agricultural operations. They have been also mute companions to humans. Several farm studies carried out in different parts of the country over year's show that about one-fourth of the total working time of farm workers is spent on maintenance of livestock and related activities.*

In India, about two-third of the population is engaged in agriculture and rearing of livestock is subsidiary activity of agriculture. There exists a symbiotic relationship in man-land-livestock ecosystem. Livestock comprising mainly cattle and buffaloes have a complementary, supplementary and sustainable relationship with crops under mixed farming system prevalent in our country. Livestock also serve as an insurance cover for the poor households being sold during time of distress. Milk and milk products play a vital role in the county's agriculture economy, being the second largest contributor to the gross agriculture produce. In Rajasthan, nearly 65 percent of the population is engaged in agriculture and cattle rearing activity.

Keywords: *Livestock, cattle rearing, regional disparities, livestock potential.*

1. Introduction :

In the economy of Rajasthan, the interdependence of agriculture and animal husbandry is more significant. After agriculture, cattle rearing are the second largest occupation and sources of livelihood in the state, especially for poor and landless laborers. The cattle rearing plays a prominent role in the rural economy by supplementing the income of rural household and generating additional income particularly for the landless, small and marginal farmers. It has also provided subsidiary occupation in semi urban area and more so far people living in the hilly tribal area. Beside this, the draft power for agriculture operation and transport has been mainly supplied by bovine and dung is used as organic manure for maintaining the soil fertility on long term basis. It also provides fuel for cooking meal in the rural area.

Rajasthan accounts for country's 10.4 per cent of land area, 5.12 per cent of human population, 5.5 per cent of cattle, 8.3 per cent of buffalo, 12.6 per cent goat and 22 per cent of sheep population. In the context of Rajasthan dairy enterprise has special significance because in the state irrigation facilities are available only for 20 per cent of the area; rainfall is very low and nearly 80 per cent of the area is characterized by either arid or semi-arid conditions. In western desert region of the state with limited farming potential and in southern hilly area due to the lack of agricultural land, livestock provide employment security. It is more stable source of income than farming, since it is less affected by failure of monsoon as compared to agriculture.

Rajasthan is considered as a rich state in livestock population. The state has 11.12 percent livestock from total livestock of India. It contributes 11 percent of total milk production of the country. Animal husbandry contributes over 13 percent to the gross domestic product of the state. In the state, livestock and milk production plays more significant role because the 61 per cent area is desert and remaining area is hilly and the lot of people of the state are small, marginal farmers and landless agricultural laborers and therefore their crop production does not sustain their families. As such people

have maintained large numbers of bovine under the mixed farming system and it is an enterprise to supplement income and reduce under employment of small, marginal farmers and agricultural laborers.

2. Review of literature :

Significance and role of livestock in rural livelihood has been supported by the following studies. Singh (2005) concluded from his study that the annual average gross income from livestock was Rs. 4366 per farmers and among livestock, sheep, goat and pigs are important source of income and employment for landless and marginal farmers at Kanke block of Ranchi, while dairy animal is important source of income and employment for small, medium and large farmers.

Podikunju (1999) in his study, "A Study on the Role of Women in Livestock Management Practices in Girwa Panchayat Samiti of Udaipur" have also concluded that 49.86 per cent of the family income was received from dairy and animal husbandry and they mostly maintained cow and buffaloes for producing good quality draft animal as well as for milk production. Dutta and Khanna (1999) have analyzed the inter regional disparities of bovine population and concluded that some districts of Rajasthan have witnessed alarming reduction in milch animal population, while in some others focus in on multiplying the milch buffalo population only which may upset the balance between crop and bovine husbandry.

A lot of studies have been undertaken on livestock population, bovine population and disparities in milk production therefore a need to focus on livestock disparities with potential in context of Rajasthan. The present paper tries to analyze the inter-regional disparities and potential of livestock in Rajasthan.

3. Objectives of the study :

The prime objective is to examine the regional disparity of livestock in Rajasthan. More elaborately, it aims at:

1. To analyze the inter-regional disparities of livestock in Rajasthan.

2. To analyze the potential of dairy development in Rajasthan.

For the accomplishment of the above objectives, following methodology has been applied in the study:

4. Methodology of the study :

Rajasthan state is purposively selected for the present study. The state is divided into seven political divisions which is as follows; Ajmer, Bharatpur, Bikaner, Jaipur, Jodhpur, Kota and Udaipur. Inter regional disparities is analyzed on the basis of the following indicators; geographical area, number of animal hospitals, livestock population, livestock density, bovine population and human-livestock ratio.

The study is based on secondary data of 2007 published by revenue board, Ajmer. Statistical tools like; Arithmetic mean, standard deviation and coefficient of variation are used for the analysis of regional disparities. Gravity model has been used to find out potential of livestock in Rajasthan.

Model building: The model equation is as follows:

$$Y_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$$

Where; Y_i is milk production (in litres),

X_1 is geographical area (in square km.),

X_2 is number of animal hospitals,

X_3 is livestock population,

X_4 is livestock density (livestock per square km.),

X_5 is human-livestock ratio and

X_6 is bovine population.

$$\text{Ratio for potential range} = \frac{\text{Potential value}}{\text{Actual value}}$$

5. Results and Discussion :

This analysis is divided into two parts. The first part deal with inter-regional disparities of livestock among political divisions of Rajasthan while second describes the livestock potential in all districts of Rajasthan.

(i) Regional disparity of livestock

The livestock population, bovine population, livestock density, animal hospitals and human-livestock ratio have shown significant regional variations across all divisions of Rajasthan. The clear picture of regional disparities in livestock rearing in the state can be shown in table 1.

Table- 1: Regional Disparity of Livestock in Rajasthan.

Name of Division	Geographical Area (sq. km.)	No. of Animal Hospital	Livestock Population	Livestock Density	Bovine Population	Human-Livestock Ratio
Ajmer	43848	180	9081883	207.12	8340283	1.11
Bharatpur	18157	130	3623901	199.58	9655282	0.59
Bikaner	64708	153	7573969	117.05	4487856	1.21
Jaipur	36570	284	8237967	225.26	8156697	0.59
Jodhpur	117801	297	16229832	137.77	10223379	1.71
Kota	24205	116	3843631	158.79	6817704	0.81
Udaipur	36950	224	9148135	247.58	6743184	1.13
Mean	**48891.30**	**197.71**	**8248474**	**184.73**	**7774912**	**1.02**
S. D.	**33844.20**	**72.53**	**4212094**	**47.91**	**1948574**	**0.39**
C. V. (%)	**69.22**	**36.68**	**51.06**	**25.93**	**25.06**	**38.88**

Source: Computed from secondary data published by Revenue Board, Ajmer, Rajasthan.

Table 1 clearly shows the regional disparities of livestock rearing in Rajasthan. Area has highest variation (69.22 per cent) followed by livestock population, human-livestock ratio, number of animal hospitals and livestock density. Among seven divisions Jodhpur has highest geographical area and its clear effect can be seen on livestock population, number of animal hospitals and bovine population while in Bharatpur division livestock and human-livestock ratio is low due to lowest geographical area. Livestock density and bovine population has equal variation. As such Udaipur division has highest livestock density due to lack of agricultural land, animal husbandry is the only source of their livelihood.

(ii) Potential of livestock

The statistical analysis of livestock potential indicates that seven out of thirty-two districts lie in high potential range while twelve lies in moderate range. It means around sixty per cent districts have huge potential for livestock rearing in the state which is shown in table 2.

Table- 2: Potential of Livestock in Rajasthan.

S. No.	Range of Potential	Number of Districts	Name of Districts
1	High (>= 1.5)	7	Bhilwara, Chittorgarh, Dausa, Dungerpur, Kota, Pali, Tonk.
2	Medium (1.0-1.5)	12	Banswara, Barmer, Bundi, Churu, Dholpur, Jhalawar, Sirohi, Jhunjhunun, Jodhpur, Rajsamand, Sawai Madhopur, Udaipur.
3	Low (0.0-1.0)	13	Ajmer, Alwar, Baran, Bharatpur, Bikaner, Hanumangarh, Jaipur, Jaiselmer, Jalore, Karoli, Nagaur, Sriganganagar, Sikar.

Source: Computed from secondary data published by Revenue Board Ajmer, Rajasthan.

Table 2 reveals that seven districts; Bhilwara, Chittorgarh, Dausa, Dungerpur, Kota, Pali and Tonk have high potential for livestock rearing due to low livestock density and human-livestock ratio. Further table reveals those twelve districts of state; Banswara, Barmer, Bundi, Churu, Dholpur, Jhalawar, Sirohi, Jhunjhunun, Jodhpur, Rajsamand, Sawai Madhopur and Udaipur have moderate potential because of favorable conditions for animal husbandry. So, in these districts there will be potential for animal husbandry.

Similarly, the indicators of livestock shows that Ajmer, Alwar, Baran, Bharatpur, Bikaner, Hanumangarh, Jaipur, Jaiselmer, Jalore, Karoli, Nagaur, Sriganganagar and Sikar districts have comparatively less potential than other districts of Rajasthan.

6. Conclusion and suggestions :

There is glaring disparities of livestock among the districts of Rajasthan which calls for remedial action through policy intervention and emphasis should laid on regional approach. The empirical evidence of present paper also indicates that there exists huge potential of livestock rearing in the state. There is a need for detail survey on livestock potentiated districts which will provide better base for planning and development of rural households.

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