Livestock Population Pattern in Plateau Region: (District-Level Analysis of Madhya Pradesh) And Analysis of Some Government Policies

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Abstract- *In This Study, We Assessed The Dynamics Of District-Level Livestock Population In India, Viz. Madhya Pradesh During The Period 2012-19. The Analytical Tools Comprised Of Simple Descriptive Statistics And Fitting Exponential Trend Equations. We Found Temporal Variations In Shares Of Different Species To Total District-Wise Livestock Population. While Population Of Cattle Declined In Madhya Pradesh, The Reverse Situation Was Observed In Case Of Buffaloes. Dynamics Of Changes In Small Ruminant Population Pointed Towards The Increasing Importance Of Goats As Compared To Sheep. Although, Cattle Are The Livestock Species On Which The Rural Population Mostly Depend For Their Livelihood In The State, Economic Dependence On Sheep And Pig Is More In Madhya Pradesh. Some Policy Suggestions Have Been Given Based On The Findings Of The Study On Leveraging The Opportunities Offered By Livestock Sector.*

HIGHLIGHTS

- *In the context of increasing population pressure and associated shrinking landholding size, diversification of agricultural activities becomes crucial.*
- *The role of livestock, on account of more equitable distribution in favour of resource poor farmers, is important for sustainable livelihood security of farmers.*
- *For formulating appropriate policies for development of livestock sector, it is necessary to carry out disaggregated analyses to assess the district-level trends and dynamics of livestock population.*

Keywords- policies; growth; livestock; Madhya Pradesh; population; production.

I. INTRODUCTION

With the relentless growth in human population, the number of holdings has increased progressively and as a consequence, the size of land holding in general has been shrinking steadily over the years, progressively making individual holdings unviable. Agricultural diversification has been considered as one of the major pillars for realizing the mandate of doubling farmers' income all throughout India. In this context, animal husbandry assumes significant importance as distribution of livestock is more equitable than that of land holding in the country. In fact in semi-arid and arid regions, among various livelihood options, livestock sector has emerged as one of the fastest-growing agricultural sub-sectors in India [1]. In fact the role of livestock in rural transformation in Indian context is well established in published literature [2-4].

Central India is agriculturally a frontline region in India, contributing significantly to the national food basket. Madhya Pradesh, in this region, agriculture contributes significant share to the state gross domestic product (SGDP). In fact the share (37%) of agriculture to SGDP in Madhya Pradesh is highest in the country. Even then, undulating topography, large proportion of waste lands, under developed irrigation potential, low ground water utilization, large proportion of rain-fed agriculture, moderate cropping intensity and high proportion of low value crops, are some of the constraints impeding agricultural sector in the two states. High proportion (29%) of landholdings being small (<2 ha) also has adverse implications for scaling up high-value crop production.

Livestock, on the other hand, plays important role for the rural households, in terms of not only providing food and livelihood security, but also acting as sources of insurance & investment and energy & power in agricultural operations. For formulating appropriate policies for development of livestock sector, it is necessary to assess the trends and dynamics of livestock population in the two states.

There have been earlier studies which have analyzed the trends in livestock population and production in specific states [5-9]. However, scant literature is available on the structural changes that have taken place in the two central states' livestock sector using the latest published official government data [10]. The present study aims to fill this gap and analyzes the district-level trends and dynamics in livestock population in the states of Madhya Pradesh.

II. MATERIALS AND METHODS

2.1 Data

This study has assessed the changes in livestock population between the last inter-census period (2012-19) in the states of Madhya Pradesh. Sources of data for this district level study are Livestock Censuses [10,11], published by Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

2.2 Analytical Framework

Tabular and percentage analyses were carried out to ascertain the spatial, breeds/species-wise and temporal compositional changes in livestock population. The annual compound growth rates (ACGR) of population of different livestock breeds/species were estimated. Population data are available only for the Census years. As such, growth rates were calculated based on the inter census period data and the same was used and extrapolated to generate continuous data. Exponential growth equation was fitted to compute the annual growth rates in livestock population.

III. RESULTS AND DISCUSSION

Trends in Livestock Population:

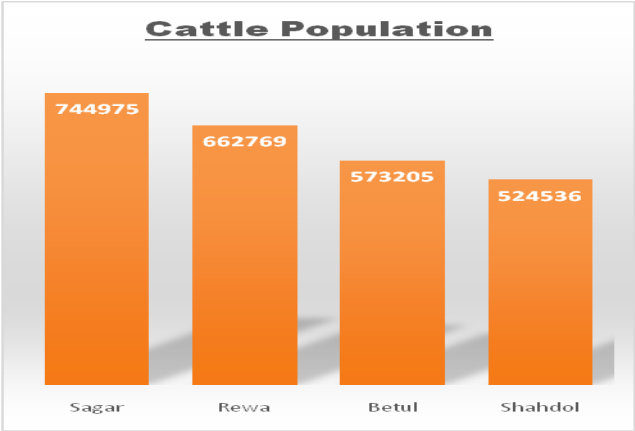
Following figs present the top ten districts in terms of highest livestock population different species (as in 2019) and their corresponding annual compound growth rates during 2012-19, respectively, for Madhya Pradesh a. During the concerned period, a few districts in both the states were bifurcated. In this context, for maintaining comparability of figures on different parameters between the two points of time, the combined districts have been considered.

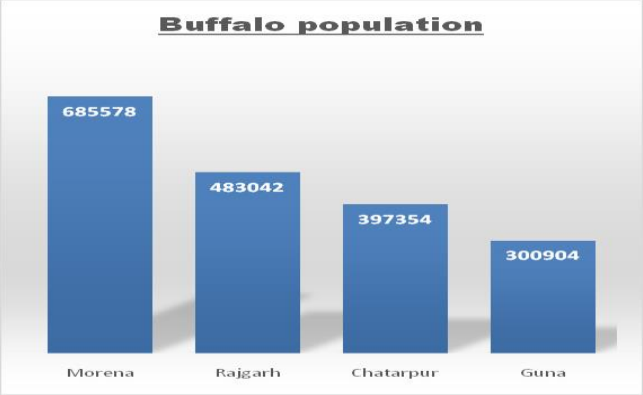
The total cattle and pig populations in the state of Madhya Pradesh have declined at the rate of 0.63 and -1.69 per cent per annum during 201219. The population of sheep increased marginally (0.38% per annum), while that of buffaloes and goats registered significant grow.

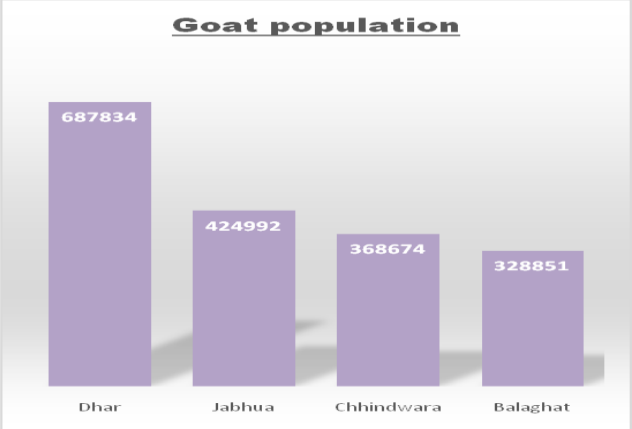
In case of cattle, among the districts with high population, asin 2019, Rewaand Satna registered negative growth rates, while the cattle population remained almost static in the districts of Sagar, Chindwara and Singrauli. Rajgarh was the only district with negative growth rate per annum in case of buffalo population among the top-ten districts with highest buffalo population as per the latest census.

In case of sheep, the top four districts (Shivpuri, Tikamgarh, Burhanpur and Rewa) with highest population registered negative or static growth during the last intercensus period. Chhattarpur and Datia were the districts with significantly high growth rates in sheep population during 2012-19.

For goats, all the districts in the top-ten list registered significant and positive growth rates. Rewa, Sidhi, Dindori, were the districts among the top-ten list, in terms of highest pig population in 2019, which reported almost no or negative rates during the concerned period.







Top 10 districts in Madhya Pradesh with highest species-wise livestock population in 2019 and their ACGR during 2012

Category-wise Percentage Change in Livestock Population:

Following fig presents the sex and age-wise population of different livestock species in the state considered in this study.

Madhya Pradesh, in case of adult indigenous male cattle, registered negative percentage change during 2012-19. This probably points towards declining demand for adult male indigenous cattle for draft purpose on account of increasing mechanization in agriculture. In Chhattisgarh, however, the opposite phenomenon was observed, as adult indigenous male cattle increased substantially during the same period. This might be due to the relatively lesser degree of mechanization of agricultural operations. Adult indigenous milch animals, on the other hand, increased in both the states, implying the preference for indigenous cows for milch purpose. Young male stock declined in both districts, implying a negative replacement rate. Young female stock, on the other hand, increased in both the districts. Crossbred cattle population of all sex and age group-wise categories increased during 2012-19 in Madhya Pradesh. It has been reported that in the developing country context, accelerated productivity growth in livestock activities brings about higher returns to land and similar returns to labour [12] which explains the shifting preference in favour of crossbred animals on account of higher yield potential.

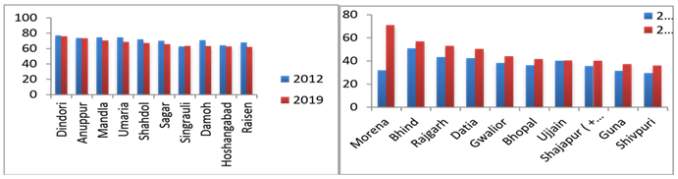
Population of young male buffalo stock declined during the concerned period in the state. Cattle slaughter for meat (beef) purpose is banned in many states of India. As such, buffalo is the major source of bovine meat, i.e. carabeef, as slaughter of buffaloes in India is not banned. The decline in young male buffalo cattle population, most probably implies increasing trends in their slaughter to cater to the international market. Similar observations were reported by FICCI [13] and Bardhan et al. [14] Adult milch buffalo and young female buffalo population increased in both the states during the last inter-census period. In case of sheep adult female population declined in the state, while the adult male population increased, implying that adult female sheep are mostly preferred for slaughtering. Goat population increased across all category-wise. This trend in goat population points towards the increasing demand for goat meat in the region. In recent past role of commercial goat farming as profitable enterprises has been highlighted [15]. However, constraints in upscaling goat farming exist in terms of lack of market infrastructure, selling of animals at market and matching irregular demand and supply were [16,17]. District-wise data in regard to category-wise changes in population of different livestock species in Madhya Pradesh, adult male buffalo (> 2 years) population declined in nearly half of all the districts in the state. Young buffalo (< 2 years) population decreased in almost all the districts. The decline in young male buffalo population probably points towards the increasing trends towards their slaughter for meat purpose, on account of rising demand. Almost all the districts in the state reported a positive change in population of female buffalo calves, young female buffaloes and in-milk female buffaloes, pointing towards increasing demand for buffaloes for milch purpose.

Share of Different Species to Total District-wise Livestock Population:

FollowingFigs. present the top-ten districts in Madhya Pradesh, respectively, in terms of shares of different livestock species to total livestock population in the respective districts.

As in 2019, cattle accounts for the highest share (46%) of livestock population in the state of Madhya Pradesh, followed by goats (27%) and buffaloes (25%). Sheep and pigs have negligible share in the state's livestock population. While this share declined for cattle during 2012-19, the same has increased for goats and buffaloes during the same period. For sheep and pigs, this share has remained almost static during the above period. Cattle is, by a fair margin, the most prominent species in the districts of Dindori, Anuppur, Mandla and Umaria, as in 2019. The shares in these districts have not changed significantly during 2012-19. The share of buffaloes in total livestock population is highest in the district of Morena, followed by Bhind, Rajgarh and Datia. The shares in all these three districts, have increased since 2012, the most significant increase having taken place in Morena. Goat is the major species in the districts of Alirajpur, Barwani and Jhabua, as in 2019, with the share of goats increasing

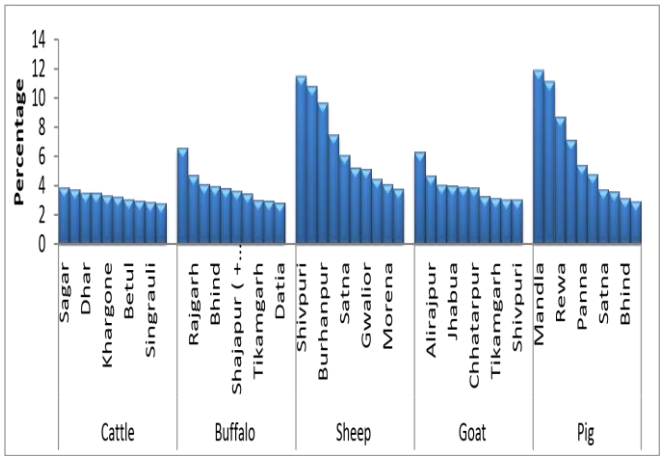
significantly in all the three districts, significantly, since 2012. Sheep and pig account meagre shares of total livestock population in almost all the districts. Only in the states of Burhanpur and Mandla, sheep and pig population contributed any substantial shares, respectively. The shares of these two species in the total livestock population have declined during 2012-19 in, practically, all the districts.



Top 10 districts in terms of species-wise shares to total district-wise livestock population in Madhya Pradesh

Share of Different Districts to States' Total Species-wise Livestock Population:

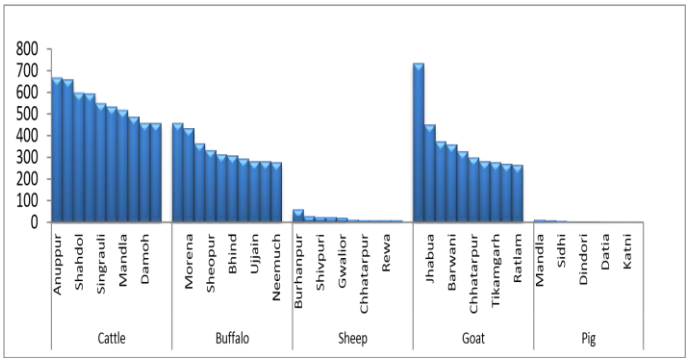
FollowingFig present the shares of top ranked districts in terms of their shares to total population for different livestock species for Madhya Pradesh.In Madhya Pradesh, which is a large state with 50 districts, not much significant variations were observed in the shares of different districts to the state's total population for most species. In case of cattle, Sagar, Chhindwara, Dhar, Khargone and Balaghat accounted for larger shares of the state's cattle population. Greater shares of the state's buffalo population, on the other hand, are in the districts of Morena, Rajgarh, Shivpuri and Bhind. Highest share of the state's sheep population, by a far margin, is accounted for by the district of Shivpuri, followed by Burhanpur and Satna. Dhar, Alirajpur, Barwani and Jhabua accounted for higher shares of the state's goat population. Mandla and Chhatarpur are the two districts which have the highest shares of pig population in the state.



Share of top 10 districts to state's total species-wise livestock population in Madhya Pradesh

Livestock Density :

FollowingFigs. elicit the district-wise population density per 1000 rural population for different species for the year 2019 for Madhya Pradesh. Livestock population per 1000 rural population gives some indication towards economic dependence of rural people on the particular livestock species. In Madhya Pradesh, the density of cattle is highest amongst all species, followed by goats and buffaloes. In comparison, the densities of sheep and pigs are insignificant. In case of cattle, the highest density is observed in the districts of Anuppur and Dindori. This implies the economic importance of this species in these districts. In terms of buffalo population density per 1000 rural population, Morena, Datia and Rajgarh are the two top ranked districts, pointing towards the rural people's high dependence on this species for their livelihood. The goat population density is highest in Alirajpur district, by a significant margin, followed distantly by Jhabua. Among all districts, economic dependence on sheep is the highest in Burhanpur district. Density of pig is the lowest across all species; the highest density being in the district of Mandla.



Livestock density per 1000 rural population in Madhya Pradesh

Important Schemes:-

1. Nandi Shala Yojana (Providing reproduction of indigenously described Gossand on grant)
2. Advanced Animal Reproductive Plan (Propagative PedigradeMurrah Sand Supply Scheme for all categories)
3. Delivery of (10 + 1) goat unit on bank loan and subsidy (scheme for all classes)
4. Male goat feeding scheme based on grants
5. Providing boar (male succor) on the basis of grant (scheme only for SC's beneficiaries)
6. Provision of the fly trilogy on the basis of the grant (scheme only for the beneficiaries of scheduled tribe)
7. Supply of poultry unit on subsidy, backyard unit of 28 days of 40 colorful chicks without gender

disabilities (Scheme only for Schedule Castes and Scheduled Tribes)

8. Provision of the fly trilogy on the basis of the grant (scheme only for the beneficiaries of scheduled tribe)
9. Supply of Kadaknath Chun on grant (scheme only for Scheduled Castes)
10. Vatsas Approval Incentive Scheme
11. GauSewak Training (Early and Refresher)
12. Gopal Award Scheme (this scheme for all classes)
13. Transit insurance scheme
14. Friendship plan Rural backyard poultry development

IV. CONCLUSION

The study has assessed the district-wise dynamics of livestock population in Plateau region of India, viz. Madhya Pradesh during 2012-19. Widespread disparities were observed in the distribution of different livestock species across various districts. While population of cattle declined in Madhya Pradesh, The reverse situation was observed in case of buffaloes. Dynamics of changes in small ruminant population pointed towards the increasing importance of goats as compared to sheep. Although, cattle is the livestock species on which the rural population mostly depend for their livelihood in the state, economic dependence on sheep and pig is more in Madhya Pradesh.

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