



Spatial Distribution Of Livestock Density In Satara District

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Abstract

Livestock is significance in the rural agrarian economy in all parts of the country. Though the livestock is a supporter of agriculture but the least developed branches of Indian agriculture on account of being food grain oriented. The causes for this can be attributed to sociological, religious, demographic, economic and other factors. The livestock density index measures the stock of animals (cattle, sheep, goats, equidae, pigs, poultry and rabbits) converted in livestock units (LSUs) per hectare of utilized agricultural area (UAA). The livestock density index provides the number of livestock units (LSU) per hectare of utilized agricultural area. In Satara district livestock are contributing a large in farm operations as well as in the uplift of the rural economy. But there are noticeable spatial differences and temporal variations in the importance placed on the different livestock enterprises. Recognition of these spatial differences and temporal variations in livestock distributions is basic to any consideration of the regional agricultural development. The research paper is attempted analyze the spatial livestock density in district. In district, about 159 livestock units per 100 hectares of arable land is observed in a whole Satara district during the period 2012. But, the spatial distribution varies from tahsil to tahsil ranging from 66 units in Mahabaleshwartahsil to 242 units per 100 hectares of arable land in Khandalatahsil.

Keywords: Livestock, Agrarian, Economy, Satara District.

Introduction

Livestock is significance in the rural agrarian economy in all parts of the country. Though the livestock is a supporter of agriculture but the least developed branches of Indian agriculture on account of being food grain oriented. The causes for this can be attributed to sociological, religious, demographic, economic and other factors. The livestock density index measures the stock of animals (cattle, sheep, goats, equidae, pigs, poultry and rabbits) converted in livestock units (LSUs) per hectare of utilized agricultural area (UAA). The livestock density index provides the number of livestock units (LSU) per hectare of utilized agricultural area. In Satara district livestock are contributing a large in farm operations as well as in the uplift of the rural economy. But there are noticeable spatial differences and temporal variations in the importance placed on the different livestock enterprises. Recognition of these spatial differences and temporal variations in livestock distributions

is basic to any consideration of the regional agricultural development.

Objective

Following are the specific objectives of the present research

1. To analyze the spatial livestock density in whole district.
2. To analyze the tahsil wise livestock density index in district.

Database And Methodology

Present research work is based on extensive field work supplemented by the secondary data sources from district livestock census (2012). The suitable questionnaire and interview technique has been applied for collection of data relating all aspects of livestock. The statistical techniques like livestock and their growth rate and livestock density per 100 hectare arable land of livestock combination areas in satara district, Tehsil is considered as a component unit for average livestock year 2012. ArcGIS- 10.3 software used for showing livestock density map.

Study Area

The Satara district selected as a study area for the present research, which is located in Sahyadri Mountain and south-western part of Maharashtra. It occupies 10,484.0 Sq. k.m. geographical area with its elevation of 742 m (2,434 ft) from the sea level. It supports total population of 30, 03,922 persons according to 2011 Census. the district involving 1739 inhabited villages in 11 tahsils like

Khandala, Karad, Wai, Mahabaleshwar, Phaltan, Man, Koregaon, Khatav, Jaoli, Satara, Patan etc..Satara district is well irrigated and agriculturally developed area of Maharashtra state. There are observed several landforms like Krishna River, Mahadeo hill ranges, Bannoli hill ranges, Sitabai hills, Aagashive hills etc. in the district. This district receives 305.6 mm to 3450.7 mm of normal annual rainfall.



TABLE
NO.1

Tahsil-wise Spatial Distribution of Livestock Growth Rate and Livestock Density in Satara District

Sr. No.	Tahsils	No. of Livestock and their Growth Rate			Livestock Density per 100 Hectare Arable Land		
		1992	2012	Growth Rate in %	1992	2012	Absolute Change in Livestock Density
1	Mahabaleshwar	12168	16411	34.87	160	66	-94
2	Wai	98094	68704	-29.96	237	133	-104
3	Khandala	86652	86709	0.07	259	242	-17
4	Phaltan	223843	209864	-6.25	261	214	-47
5	Man	248247	264260	6.45	282	238	-44

6	Khatav	158212	127775	-19.24	130	103	-27
7	Koregaon	112176	104904	-6.48	167	143	-23
8	Satara	143632	97605	-32.05	241	141	-100
9	Jaoli	65108	31645	-51.4	123	77	-46
10	Patan	164336	116127	-29.34	188	111	-78
11	Karad	204502	187282	-8.42	238	209	-28
Total		1516970	1311286	-13.56	207	159	-48
Mean		137906	119208	-12.89	208	152	-55
SD		58079	66981	16.95	53	61	31

Source: Calculated by scholar on the basis of Livestock Census of Satara District, 1992 to 2012

Spatial Distribution of Livestock Density, 1992-2012

The spatial distribution of livestock density is interrelated to many factors such as the suitability of physical environment, availability of fodder and grazing land, nature of economy, type of farming, size of landholding, cropping pattern, standard of living, pressure of population, nutritional aspects of people, transportation network, marketing compatibility and temperamental predilections of farmers. The livestock includes bovine population like cattle and buffaloes; ovine population like sheep and goats and other livestock includes pigs, horses, etc. As per the Fifteen Quinquennial Livestock Census, 1992, the total livestock units was 15,16,970 and 13,11,286 the total livestock units as per Nineteen Livestock Census of 2012 in Satara district.

The major problem which arises in studying the distribution of livestock is the selection of the category of land to which the units should be compared. Broadly speaking, livestock densities may be calculated on the basis either arable land or pasture and grazing land. Since much importance is being given to arable land in this country, land used for rough grazing and pasture development is very meagre. Therefore, the study of spatial distribution of livestock in relation to grazing land may not provide any comprehensive picture. Remaining to the scarcity of sufficient grazing and pasture grounds for feeding of the livestock in the country, stand feeding is the common practice especially to the main categories of livestock. The by-products of most of the leguminous and non-leguminous crops i.e. left after separating specially called dry fodders are used throughout the year. It is touched that the possible solution to the problem of viewing the distribution of livestock lay in the use of arable land. However, a map on this basis presents a satisfactory indication of livestock distribution. So, that the number of livestock units is calculated to 100 hectares of

arable land for the Livestock Census of the year 1992, and 2012.

The pressure of the total livestock density is calculated to per 100 hectares of arable land. The table no.1 exhibits that the district as a whole has 207 livestock density per 100 hectares of arable land in Satara district during the period of 1992, but the spatial distribution varies from tahsil to tahsil ranging from minimum of 123 units in Jaolitahtsil to maximum of 282 livestock per 100 hectares of arable land in Man tahsil. Therefore, the district has been divided into three groups based on mean and standard deviation viz. high (above mean +SD), moderate (mean to mean +SD) and low (below mean).

As per 1992 census, table no.1 reveals that the high livestock density per 100 hectares of arable land i.e. above 261 are found in Man and Phaltantahsils due to the limited availability of agricultural land is one of the reasons for high densities of livestock, dry area, inadequate development of irrigation facilities and shallow soil in Man tahsil. While Phaltantahsil i.e. significantly potential zone for the sustenance of large number of livestock. Because of moderate rainfall conditions, perennial grazing facilities in the vast stretches of forest cover, year around supply of dry fodder due to success of crop farming especially maize and jowar cultivation, high purchasing power of the people due to agricultural prosperity, good transport and market facilities, etc. are all conducive for supporting large number of livestock in this region.

The moderate i.e. ranging between 208 to 261 livestock units is noticed in Wai, Khandala, Satara and Karadtahsils, out of which, three tahsils located in the adjoining area of forest cover in the northern upland region. Here, large number of Sheep and Goat units is reared in Khandala and Waitahsil while Cattle and Buffaloes reared in Satara and Karadtahsil both for farm operations and for milk production.

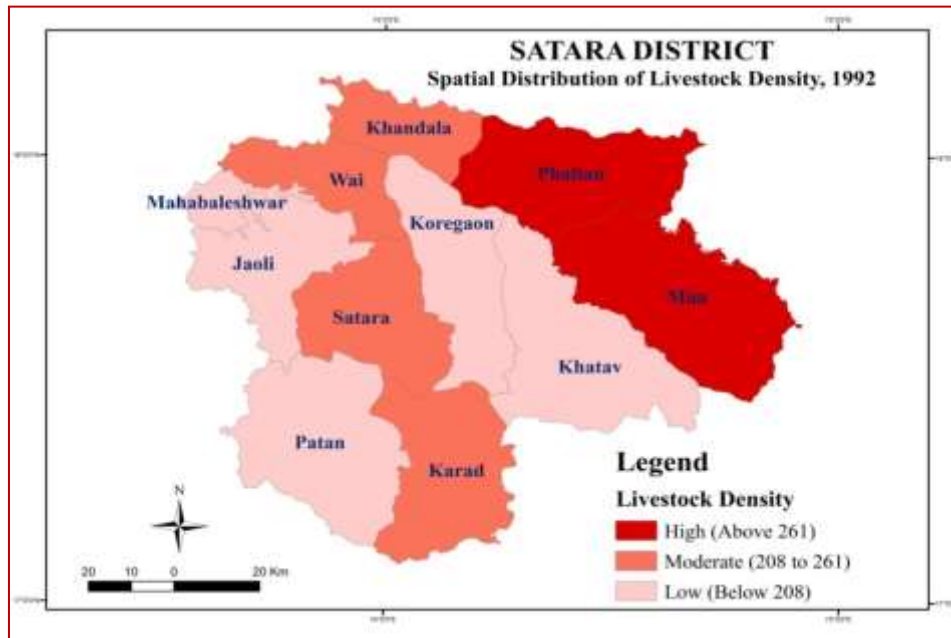


Fig. No.2

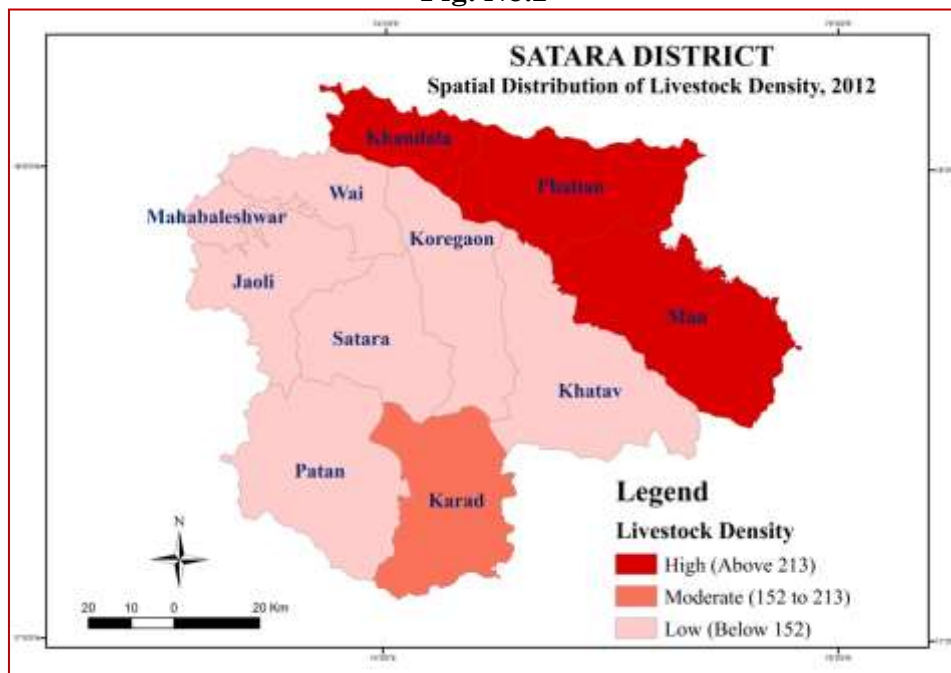


Fig. No.3

The low i.e. below 208 livestock density is found in Mahabaleshwar, Khatav, Koregaon, Jaoli and Patantahsils. Because low carrying capacity of the land and the low agricultural efficiency. Therefore, many parts of western district are low density of livestock pressure. Here, cropping is mostly confined to one season with millets and groundnut are dominant crops and in effect low production of dry fodder, low population density, and poor socio-economic situations of the folks, therefore, minimised the supporting of more livestock.

Spatial Distribution of Livestock Density, 2012

Table no. 1 reveals that the district as a whole has 159 livestock units per 100 hectares of arable land in Satara district during the period 2012. But the spatial distribution varies from tahsil to tahsil ranging from 66 units in Mahabaleshwartahsil to 242 units per 100 hectares of arable land in Khandalatahsil.

Table no.1 exhibits that the high concentration of livestock units per 100 hectares of arable land i.e. above 213 is found in Man, Khandala and Phaltantahsils. Because limited availability of agricultural land, dry area, low development of irrigation facilities and shallow soil in Man tahsil. In Khandalatahsil, high rainfall, hilly area,

perennial grazing facilities in the vast stretches of forest cover leads to high concentration of sheep and goat rearing. While Phaltantahsil i.e. significantly potential zone for the sustenance of large number of livestock units. Because, there are moderate rainfall, high purchasing power of the people due to agricultural prosperity, good transport and market facilities, etc. are all conducive for supporting large number of livestock units in this region.

The moderate concentration of livestock units i.e. ranging from 152 to 213 is recorded only in Karadtahsil due to the high development of irrigation leads to high development of agriculture resulted in high number of rearing cattle and buffaloes for farm operations and milk production.

The low concentration of livestock units i.e. below 152 is registered in Mahabaleshwar, Wai, Khatav, Koregaon, Satara, Jaoli and Patantahsils. Because located in drought-prone area, hilly area, undulating topography resulted in an account of the low carrying capacity of the land and the low agricultural efficiency.

Absolute Change in Livestock Density (1992-2012)

The table 4.4 exhibits that the change in livestock density in the district during the period of investigation. All most all tahsils marked decline in the total livestock density per 100 hectares of arable land from 1992 to 2012 in the district.

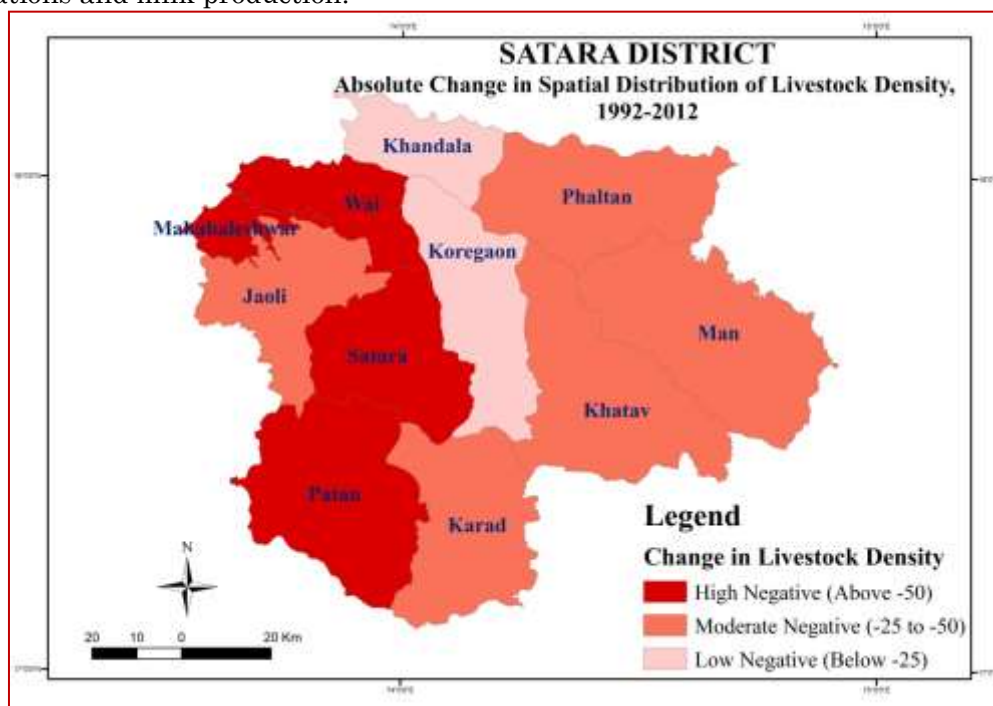


Fig. No. 4

The high negative change in livestock density i.e. above -28 percent is found in Mahabaleshwar, Wai, Satara, and Patantahsils. Because these tahsils are located in hilly area, dense forest, heavy rainfall leads to high livestock ranching in during the period of 1992, but recently, the development of technology and change the attitude of farmers rapidly declined the livestock ranching. The moderate negative change i.e. ranging from -25 to -50 percent is recorded in Phaltan, Man, Khatav, Jaoli and Karadtahsils. The low negative change in livestock density i.e. below -25 percent is found in Khandala and Koregaontahsils because suitable condition for the livestock rearing.

Conclusion:

The distinct spatial distributions of the different types of livestock within the district have been revealed that the district intense with favourable environment for a plenitude of livestock resources especially cattle, buffaloes, sheep, and goat. Because of the stimulatory environment created by irrigation, fodder cultivation, transport accessibility, market compatibility and changing agro-technology. The role of cattle has diminished, while that of buffaloes enhanced spectacularly.

It reveals that there has been a great motivation for the development of dairy farming as a secondary occupation to crop husbandry. The favourable agro-climatic and

socio economic conditions as well as large numbers of she-buffaloes in the areas of Satara, Karad, Patan, and Jaolitahtsils are favourable for the development of intensive dairying. The high concentration cattle in the areas of Mahabaleshwar, Jaoli, Patan and Waitahsils are the favourable for the dairy farming. With the help of modern innovations and diffusion methods the White Revolution can be brought along with the Green Revolution in this region.

Though, there was a decline in sheep population during the study period, the place of ovine population consists sheep and goats is yet to play an adequately important role in the livestock economy of the dry and drought-prone areas of the district. The hilly area, vast areas under forest, extensive grazing lands and semi-arid climatic conditions are most favourable factors for the development of sheep and goat rearing in the Northern and Eastern tahsils viz. Khandala, Phaltan, Man, Wai and Khatavtahsils. In this region, the development of mutton breed is considered suitable. Especially, for the development of commercial sheep and goat ranching which is more profitable than cattle, but which is very vulnerable to disease, the intensive treatment and health care as well as breeding facilities must be rendered to all the interior places.

On the whole, the favourable environment and distribution of different types of livestock in the district may be measured for the development of differentiated livestock farming on sound edifice by applying modern technology. Since crop husbandry is unstable, un-protective and unproductive in most of the rain-shadow areas of the district, animal husbandry has to be excogitated as a subsidiary occupation to alleviate the economy of the farmer community. Here, the diversification in the agriculture i.e. mixed farming must be brought to avoid the environmental and socio-economic problems created by monocultures and to make maximum use of available biodiversity to adapt agriculture to changing environments and adverse conditions. The concept of White Revolution is to be placed on an equal plane with Green Revolution and both these diversified farming activities must be made to travel together to achieve the noble destination of the rural economic uplift of this backward region.

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