
Research Papers



SPATIAL DISTRIBUTION OF CATTLE MARKET CENTRES IN SOLAPUR DISTRICT OF MAHARASHTRA

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Abstract

Solapur District is selected as a study region for the present investigation. The district is situated on the south-east fringe of Maharashtra state and lies entirely in the Bhima and Sina basins. Economy of the region has an agrarian base. Out of total working population nearly two third (67.55%) working population engaged in primary economic activity, especially in agriculture and one third in secondary and tertiary sectors of economy. In this district the cattle market centres depend upon the agriculture. So the cattle market centres at Sangola, Akhuj, Barshi, Solapur, Modnimb (Weekly Cattle Market), Pandharpur (Tri Annual fair Cattle Market) and Solapur, Sangola (Annual Fair Cattle Market) are the biggest cattle market centres and are famous for khilari Bullocks, Cows and Pandharpuri Buffaloes all over India.

Cattle market centres are economically most variable and represent the regional development of pattern. They provide trade and commerce services to the study region; act as nodal centres for transportation serve as growth centres by providing various services to the region. Cattle market centres also help in increasing social contacts, serve as centres of diffusion and become focus for political and other activities. Hence, the cattle market centres have predominant economic importance in any region. The present to enquire into is an attempt to assess the spatial distribution of cattle market centres in Solapur District, Maharashtra. The entire to enquire into is based on the intensive field work carried out which is supplemented by the secondary sources of data abstracted from socio – economic review and district statistical abstracted. The questionnaire and interview techniques have been employed to collect the data and information regarding all the aspects of cattle market centres. The analysis reveals that the significant relationship of cattle market centres is observed with physiographic,

area, population, settlement and net sown area. It is also observed that region has random to regular and regular distributional pattern of cattle market centres.

Keywords: Cattle Market Centres. Agricultural Produce Market committees, Gram Panchayat, Spatial Distribution.

INTRODUCTION:

Cattle market centres are economically the most important regional development of pattern. They provide tertiary services to the region act as nodal centres for transportation and serve as growth centres by providing various tertiary services to the region. Cattle market centres also help in increasing social contact serve as cattle market centres of diffusion and become focus for political and other activities. Hence the cattle market centres have predominant economic importance in any region. Market centres also play a vital role in social – economic development of region. The periodicity of markets varies from region to region.

It depends on the density of population,

the demand by the rural folks and nature of surplus of local products. The command area and threshold population of the market on standard of markets and number of sold in the market centres. It also depends on administration, location and road links between the markets and its umland (Jana, 1978). The frequency of cattle market centres days and also influenced by the neighboring region and the distance of the cattle market centres from nearest town.

OBJECTIVES:

In View of the above, following are the specific objectives of the present investigation.

1. To analyze the spatial distribution of cattle market centres.
2. To analyze the cattle market centres relationship to physiographic, administrative unit, area, population, settlement, cattle population and net sown area.

DATABASE

For the analysis of the existing status of the various aspects of cattle market centres, related data and information have been collected from various sources. The present work is based on primary data, collected through intensive fieldwork. A data has been collected with the help of questionnaire, interviews and experience of senior citizens. The secondary data has been collected from the District Gazetteers, District Census Handbooks, and Socio – economic reviews, APMC and GP office of the study region.

METHODOLOGY

In the present work various statistical and quantitative techniques have been employed for analyzing various aspects of cattle market centres the quantitative techniques of nearest neighbour techniques are employed to investigate the attributes of cattle market centres and spatial distributional pattern of cattle market centres in Solapur District, Maharashtra. The results are shown with the help of tables and maps.

STUDY REGION

Solapur District is selected as a study region for the present investigation. Geographically Solapur is located between 17° 10' to 18° 32' North latitude and 74° 42' to 76° 15' east longitude. The district is situated on the south east fringe of Maharashtra state and lies entirely in the Bhima and sina basins and its tributaries. The district is surrounded by Ahmednager district to the north, Osmanabad district is the North – East, Karnataka state to the South - East, Sangli district to the South - West, Satara district to the West and Pune district to the North -West. The district covers Geographical area of 14895.40 sq.kms.

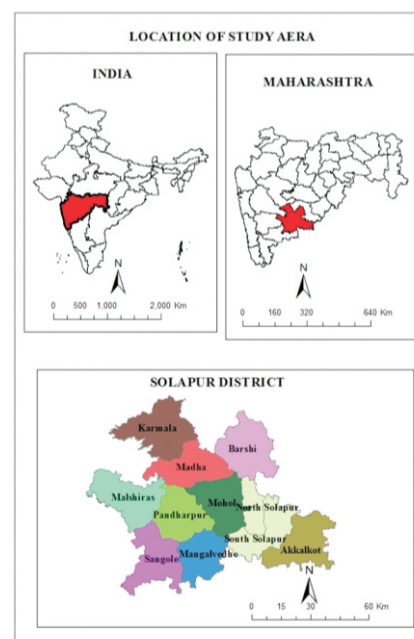
This is 4.82 percent of the total area of Maharashtra state. and a population of 38, 49,543

(2001 census), which is 3.97 % of total population of the state. It ranks 8th in population in the state. Out of the total area of the district 348.80 sq.kms. (2.28 %) is urban area where as remaining 14546.60 sq.kms. (97.72 %) is rural area. The district is having 11 Tahsils. (Fig. No. 1). Area wise Karmala tahsil is biggest covering an area of 1609.70 sq.kms. and North Solapur is smallest covering an area of 746.30sq.kms.

Economy of the region has an agrarian base. Out of total working population nearly two third (67.55 %) working population engaged in primary economic activities, especially in agriculture and one third in secondary and tertiary sectors of economy. Solapur district famous for its chadder, handloom, Power loom, Beedi industries and Khilari bullocks and cows. In the district the cattle market centres at Sangola , Akluj, Modnimb, Barshi, Solapur (Weekly Cattle Market) Pandharpur (Tri Annual Fair cattle Market), Sangola, Solapur (Annual Fair Cattle Market) are the biggest cattle market centres and are famous for khilari bullocks, cows and Pandharpuri buffaloes (Plate No. 1) all over India.

ANALYSIS OF CATTLE MARKET CENTRES:

Geographers are interested in the spatial distribution of geographical phenomena. In case of cattle market centres their origin, growth; development spatial distribution is the results of combined effect of various factors. In the study regic



unevenly distributed. The physical factors are very important in the location of cattle market centres. However, the social and particularly economic factors play a significant role in determining whether

a particular centre should grow, develop and function as cattle market centres. As the market centres serve the demand of surrounding population, the spatial distribution of market centres, therefore, is affected by the distribution of population (Hodder, 1965, p.51). Even at the tahsil level there is great variation in the distribution of cattle market centres in the study region. All these affecting factors are grouped into physical, social, cultural, political and economic factors. Each factor has its own influence and they affect directly or indirectly on the distribution of cattle market centres. However, merely numerical distribution of cattle market centres 'per say' does not give correct picture as it ranges from six in Sangola, Malshiras tahsils and only one in South Solapur tahsil. The correlation between number of such phenomena with physiographic divisions, administrative unit, area, population, inhabited villages and net sown area etc. may therefore, give a more realistic picture (Grapure and Pawar, 1991). Such Correlations are analyzed below.

DISPERSION OF CATTLE MARKET CENTRES

The spatial distribution of cattle market centres in the study region has been examined in the light of well know technique, namely the "Nearest Neighbor Analysis". The statistical technique called the 'Nearest Neighbour Analysis' was first developed by plant ecologists Clark and Evans (1954). This technique has been employed by geographers to study any point phenomenon.

The technique of 'Nearest Neighbour Analysis' is very useful in the study of spatial distribution of pattern. Nearest Neighbor Techniques of Clark and Evans (1954) modified by Decay (1965) has been used to compare the dispersion (Rn) of cattle market centre.

$$Rn = \frac{rA}{rE}$$

Where, Rn = Index of randomness,

$$rA = \frac{\text{Total inter distance of Cattle Market}}{\text{Total number of Cattle Market}}$$

and

$$rE = \frac{1}{2\sqrt{d}}$$

Where,

$$d = \frac{\text{Cattle Market}}{\text{Area}}$$

Using the above equation, nearest neighbour index (Rn) has been calculated for the entire region considering as a single unit. The value of this statistic necessary ranges from 0.0 (complete concentration /

cluster) through 1.0 (random) to 2.1491 (uniform / regular). Since the study region present a visible contrast in the pattern, density and spacing of cattle market centres, the 'Rn' values at tahsils level has been also calculated. It is observed that, there is nearer to uniform distribution of cattle market centres, where the degree of randomness is 1.36. The comparative analysis of the values tahsils like North Solapur and South Solapur indicates the clustered distribution ranges between 0.50 to 0.75.

Table 1.

Solapur District: Nearest Neighbour Statistics of Cattle Market Centres

Sr.No.	Tahsil	Cattle Market Centres	rE (Kms.)	rA (Kms.)	'Rn' Values
1.	Karmala	02	17.75	14.18	1.25
2.	Barshi	03	18.33	11.11	1.65
3.	Madha	04	16.87	9.82	1.71
4.	Mohol	04	16.50	9.38	1.75
5.	Malshiras	05	11.10	8.66	1.28
6.	Pandharpur	02	13.75	12.76	1.07
7.	North Solapur	01	0.00	13.65	0.00
8.	South Solapur	01	0.00	17.28	0.00
9.	Sangola	05	15.75	8.80	1.78
10.	Mangalwedha	02	18.25	11.94	1.52
11.	Akkalkot	06	11.87	7.611	1.55
Study Region		35	14.10	10.31	1.36

Source: Compiled by the Researcher Based on different Govt. organization (APMC, Gram Panchayat & MCI)

Rn values of Pandharpur, Malshiras and Karmala tahsils indicates nearer to uniform where values range from 1.10 to 1.25. Akkalkot tahsil indicate random distribution towards regular pattern, having the range between 1.25 to 1.50. Whereas Mangalwedha, Sangola, Barshi, Madha and Mohol tahsils have 'Rn' value above 1.50 has uniform pattern (Table 1 and Fig.2).

SPATIAL DISTRIBUTION

Geographers are mainly concerned with the spatial distribution of geographical phenomena. The distributional characters of cattle market centres are influenced by physiographic, social, cultural, political, and historical and many other unique qualities prevailing in the study region. In the study region cattle market centres are unevenly distributed. It ranges from Sangola (5), Akkalkot (6) and Malshiras (5) tahsils to only one in North Solapur and South Solapur tahsils. It is observed that, number of cattle market centres are above $\bar{\chi}$ in which five tahsils in which Madha and Mohol, $\bar{\chi} + 1$ S. D. and Akkalkot, Malshiras, Sangola tahsils are in the class $\bar{\chi} + 2$ S. D. Remaining six tahsils are below $\bar{\chi}$ in which Karmala, Barshi, Pandharpur and

Magalwedha tahsils fall in the class $\bar{\chi} - 1$ S. D. and North Solapur and South Solapur tahsils fall in the $\bar{\chi} - 2$ S. D. Class.

However, merely numerical distribution of cattle market centres 'per se' does not give correct picture. The correlation between numbers of such phenomena with physiographic divisions, area, population, settlement, cattle population and net sown area etc. may, therefore, give a more realistic picture (Gharpure and Pawar, 1991).

1 Physiographic Regions and Cattle Market Centres Ratio

Though the study region has little variation in terms of physiography but whatever the variation exists, it affects considerably on the distribution of cattle market centres. Study region can be sub-divided into different physiographic units based on upon the altitudinal characteristics viz. i. The hilly region (600 – 900 mts.) ii. Plateau region (450 – 600 mts.) and iii. Plain region (300 – 450 mts.) The hilly region is characterized by only 2.86 per cent of cattle market centres which covers about 5 per cent of total geographical area of the study region (Table 2). It is noteworthy that, plateau region of the study region has accommodate the large share of cattle market centres (65.71 %). Out of the total cattle market centres 31.43 per cent are distributed in the plain region. The plateau and the plain region are relatively agricultural and other activities like dairy farming, animal husbandry, meat which support most of population

In short, the comparison between percentage of area having hilly, plateau and plain region and percentage of cattle market centres therein reveals that, only plain region has more cattle market centres and comparatively hilly and plateau and hilly region have less cattle market centres so far as their shear in total geographical area is concern.

Table 2.

Solapur District: Physiographic Division and Distribution of Cattle Market Centres

Sr.No.	Physiographic Division	Area		Cattle Market Centre	
		Km ²	Percentage	Number	Percentage
1.	Hilly Region	744.77	05	01	02.86
2.	Plateaus	11171.55	75	23	65.71
3.	Plains	2979.08	20	11	31.43
Study Region		14895.40	100.00	35	100.00

Source: Based on 1. Director, Ground Water Survey and Development Agency, Government of Maharashtra, 1972-73. 2. Agricultural Produce Market Committee 2010.

2. Area and Cattle Market Centres Ratio

It is observed that, number of cattle market centres per 100 km² are 0.235 in the study region. The spatial variation between area and cattle market centre ratio reveals five tahsils like Madha, Mohol,

Malshiras, Sangola and Akkalkot have more ratio than the study region as a whole. Out of which Madha, Mohol, Malshiras and Sangola tahsils, fall in the class $\bar{\chi} + 1$ S.D., Akkalkot fall in the class $\bar{\chi} + 2$ S.D. and the remaining six Karmala, Barshi, North Solapur, Pandharpur, Mangalwedha and South Solapur tahsils are fall in the class $\bar{\chi} - 1$ S.D. (Fig.3.A). However, it is observed that, the correlation between these variables is insignificant ($r = 0.61$). It means not merely the area of tahsil affects on distribution of cattle market centres but other factors also affects on it.

3. Population and Cattle Market Centres Ratio

Study region has 0.909 market centre per 10,000 populations. The tahsil level analysis indicates that, tahsils like Madha, Mohol, Malshiras, Sangola, Mangalwedha, and Akkalkot have the higher values than the regional average. Out of which Madha, Mohol, Malshiras and Mangalwedha, fall decline in the class $\bar{\chi} + 1$ S.D. and two tahsils Sangola and Akkalkot fall in the class $\bar{\chi} + 2$ S.D. The remaining tahsils (Karmala, Barshi, North Solapur, Pandharpur, and South Solapur) shows the lower values than the regional average. Out of which Karmala and Barshi fall in the class $\bar{\chi} - 1$ S.D. and three tahsils viz. North Solapur, Pandharpur and South Solapur are fall in the class $\bar{\chi} - 2$ S.D. (Fig.3.B). The co-relation analysis between the two variables indicates negative correlation. ($r = -0.28$).

4. Village and Cattle Market Centres Ratio

It is observed that, number of cattle market centres per 100 villages stands 3.043 in the study region. This relationship ranges from 4.902 in Sangola tahsil to 1.099 in South Solapur tahsil. The relationship also shows that six tahsils fall in class above $\bar{\chi}$. Out of which Madha and Mohol fall in the class $\bar{\chi} + 1$ S.D. and three tahsils like Malshiras, Sangola and Akkalkot tahsils $\bar{\chi} + 2$ S. D. The remaining four tahsils are below $\bar{\chi}$, of which Barshi, North Solapur, Pandharpur, and Mangalwedha fall or decline in the $\bar{\chi} - 1$ S.D. and the tahsils Karmala and South Solapur falls declines in the class $\bar{\chi} - 2$ S. D. (Fig.3.C). These two variables positively correlate ($r = 0.63$). It is also observed that, the density of villages in the hilly and plain area is more where the number of cattle market centres is less, whereas relatively in plateaus area the density of village is less but the number of cattle market centres is more. It is mainly due to the size of the villages which is big in plain area and comparatively small in hilly and plateaus area (Fig.4.C).

Solapur District: Distributional Relationship of Cattle Market Centre

Sr. No.	Tahsil	Number of Cattle Market Centres					
		Number	Per 100 Sq.km.	Per 100,000 Population	Per 100 Settlement	Per 1000 Cattle Population	Per 10,000 Hectares Net Sown Area
1.	Kamala	2	0.124	0.857	1.695	0.122	0.016
2.	Madha	4	0.259	1.367	3.419	0.231	0.030
3.	Barshi	3	0.202	0.880	2.158	0.206	0.024
4.	North Solapur	1	0.134	0.104	2.439	0.126	0.018
5.	Mohol	4	0.284	1.584	3.846	0.217	0.038
6.	Pandharpur	2	0.153	0.497	1.960	0.075	0.021
7.	Malshiras	5	0.328	1.183	4.274	0.136	0.043
8.	Sangola	5	0.322	1.838	4.902	0.170	0.041
9.	Mangalwedha	2	0.175	1.168	2.469	0.117	0.023
10.	South Solapur	1	0.084	0.474	1.099	0.082	0.010
11.	Akkalkot	6	0.432	2.069	4.348	0.336	0.050
$\bar{\chi}$		3.181	0.235	0.909	3.043	0.163	0.030
S.D.		1.641	0.187	0.583	1.191	0.178	0.137
C.S.D.		0.515	0.823	0.533	0.401	1.078	4.724

Source:

1. District Census Handbook, Solapur District, 2001.
2. Socio-Economic Review and District Statistical Abstract, 2010.
3. Department of Animal Husbandry, Government of Maharashtra, 2002.



5. Cattle Population and Cattle Market Centres Ratio

It has been being observed that, number of cattle market centres per 1000cattle population is 0.163 for the study region on whole. The tahsils level analysis indicates that tahsils like Madha, Barshi, Mohol, Sangola and Akkalkot have the higher values than the regional average. The remaining tahsils shows the lower values than the regional average. However, this spatial variation at tahsil level is very

significant (Ubale and Lokhande 2011). This relationship comes to 0.336 in the case of Akkalkot tahsil which falls to 0.075 in the case of Pandharpur tahsil. The five tahsils have their value above $\bar{\chi}$. Out of which Madha, Barshi, Mohol and Sangola tahsils, falls in the class $\bar{\chi} + 1$ S.D. and only one tahsil i.e. Akkalkot fall in the class $\bar{\chi} + 2$ S.D. Remaining tahsils have below $\bar{\chi}$ value. Out of which Karmala, North Solapur, Pandharpur, Malshiras and Mangalwedha tahsils falls in the class $\bar{\chi} - 1$ S.D. and only one tahsil South Solapur are fall in the class $\bar{\chi} - 2$ S.D. (Fig.3.D). The co- relation analysis between these two variables indicates negative relationship ($r = 0.58$). It is significant due to adequate cattle population the required demand to sustain the cattle market centres of the study region.

6. Net Sown Area and Cattle Market Centres Ratio

In the study region, there are 0.032 cattle market centres per 1000 hectare net area snow. However, it has noteworthy spatial variation. This relationship found as maximum 0.050 in Akkalkot tahsil minimum 0.010 in South Solapur tahsil. It is observed that, five tahsils fall in the classes above $\bar{\chi}$. Out of which Madha, Mohol, Malshiras, Sangola and Akkalkot tahsils fall or decline in the class $\bar{\chi} + 1$ S. D. whereas remaining tahsils fall in the classes below $\bar{\chi}$. Out of which Karmala, Barshi, North Solapur, Pandharpur, Mangalwedha and South Solapur tahsils fall in class $\bar{\chi} - 1$ S. D. (Fig.3.E) The co- relation analysis between these two variables indicate positive correlation ($r = 0.65$).

CONCLUSION

The foregoing analysis reveals that, spatial distribution of cattle market centres is uneven in the study region. There are 30 weekly, 1 tri annual and 4 annual cattle market centres. Spatial distribution of cattle market centres has been largely influenced by physiographic as well as population, development of transportation network, pattern of settlement and development agriculture of economic activities. As such the weekly cattle market and annual fair cattle markets are concentrated in plain region which is fertile and well developed part of the study region. It is further observed that, study region has random to regular distributional pattern of cattle market centres. a30 cattle market meetings are held in a week in the study region. The lowest cattle market meetings are held in North and South Solapur tahsils and highest cattle market meetings are held in Akkalkot tahsil.

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