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## Spatial Distribution Of Livestock Combination In Satara District, Maharashtra

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### Abstract

The study of livestock-combination analysis is an important aspect in agricultural geography. It is useful by different ways. Firstly, it provides sufficient understanding of individual livestock. Secondly, it helps us in interpreting some aspects of social and economic environment of the region. It further indicates the problems and basis for agricultural planning. The combination analysis was originally introduced in geographical research by Weaver (1954) through his outstanding study of crop combination in Mid-Western United states. The purpose of procedure is to establish and designate crop or livestock combination which is established by the closest resemblance to the actual livestock percentages of the theoretical distribution. Among the other geographers who have either modified the Weaver's techniques by Doi and Rafiullah may be worth mentioning. To get clear view of livestock combination and comparative purpose this study is carried out by implementing one method proposed by J. C Weaver. Present research work is attempted to analyze the spatial livestock combination in whole district. The statistical techniques like- C. Weaver method- Livestock Combination is applied for spatial analysis of livestock combination areas in Satara district. The cattle, buffaloes and goat i.e. C+B+G livestock combination was recorded in Mahabaleshwar, Wai, and Koregaon tahsils. The sheep, cattle and goat (S+C+G) type livestock combination was found in Khandalatahsil. The buffalo, cattle and goat (B+C+G) livestock combination is found in Khatav, Satara, Patan and Karad tahsils. Sheep-goat-cattle livestock combinations are found in Man tahsil. The Cattle-sheep-goat livestock combination is found only in Phaltan tahsil.

**Key Words:** Livestock, Combination, Distribution, Rural, Satara.

### Introduction

The livestock-combination analysis is an important aspect in Human geography especially in agricultural geography. It is useful by different ways. Firstly, it provides sufficient understanding of individual livestock. Secondly, it helps us in interpreting some aspects of social and economic environment of the region. It further indicates the problems and basis for agricultural planning. The combination analysis was originally introduced in geographical research by Weaver (1954) through his outstanding study of crop combination in Mid-Western United states. The purpose of procedure is to establish and designate crop or livestock combination which is established by the closest resemblance to the actual livestock percentages of the theoretical distribution. Among the other geographers who have

either modified the Weaver's techniques by Doi and Rafiullah may be worth mentioning.

The Satara district is located in the south-western part of Maharashtra, where, buffalo, cattle, sheep and goat are the important livestock having different livestock combination in all tahsils.

### Objective

Following are the specific objectives of the present research

1. To analyze the spatial livestock combination in whole district.
2. To analyze the tahsil wise livestock combination 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- J. C. Weaver method-Livestock Combination is applied for spatial analysis 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 combination index.

### 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, Bamnoli hill

ranges, Sitabai hills, Aagashive hills etc. in the district. This district receives 305.6 mm to 3450.7 mm of normal annual rainfall.

### Analysis of Livestock Combination Regions

It is obvious that no single category of livestock is to be found completely in an area unit. Just like crops, various categories of livestock are to be reared in combination. Although, there are major spatial variations in the significance of the individual categories of livestock, different areas specialise with different combinations of livestock and which are distinguished from one another. The diversified physical and socio-economic conditions may profoundly influence the specialisation of animal groups. To influence upon the significance of the specialisation of livestock types in varied associations, livestock combinations need to be produced. The study of livestock-combination analysis is an important aspect of agricultural geography. It is useful in different ways. First, it provides an adequate



understanding of individual livestock. Secondly, it helps us to understand some aspects of the social and economic environment in the region. It further shows the problems and basis for agricultural planning.

There are many scholars who have contributed to the development of livestock management. Weaver (1954) presented a combination analysis originally in geographical research through an excellent study of crop composition in the Midwestern United States. The purpose of the process is to establish and assign a livestock combination that is established by closest equivalent of the actual livestock percentage of the theoretical distribution.

This study is done by applying method proposed by C. Weaver. Analysis of Livestock Combination Areas in Satara District, Tehsil is considered as a component unit for average livestock year 2012.

### **Livestock Combination Regions based on Weaver's Method**

The study of livestock combination is important for understanding the livestock system in a particular region. Weaver's technique has been used for the year of 2012 for the regionalization of livestock in Satara district

#### **Livestock Combination in 2012**

As per 2012 census of livestock, table no.1 indicates that the district as a whole has four livestock combination i.e. cattle, buffaloes, goat and sheep (C+B+G+S), but livestock combination varies from tahsil to tahsil.

#### **Two Livestock Combination**

The two livestock combination is recorded only in Jaolitahtsil i.e. cattle and buffaloes (C+B) livestock due to this tahsil is located in hilly area, rugged topography, heavy rainfall, dense forest and shallow soil resulted in low development of agriculture and agro-base industries.

**Table No. 1**

**Livestock Combination Variance Calculated on the basis of Weaver's Method, 2012**

Sr. No.	Tahsils	Monoculture	2-Livestock Com	3-Livestock Com	4-Livestock Com	5-Livestock Com	Livestock Com Index
1	Mahabaleshwar	1345.62	399.31	518	562.24	-	C+B+G
2	Wai	3908.07	366.73	71.36	72.46	-	C+B+G
3	Khandala	3210.71	308.91	110.33	151.69	-	S+C+G
4	Phaltan	4568.98	328.32	16.94	84.44	-	C+S+G
5	Man	4138.13	305.64	64.55	72.45	-	S+G+C
6	Khatav	4367.94	370.37	46.72	50.03	-	B+C+G
7	Koregaon	3993.36	319.5	71.57	73.5	-	C+B+G
8	Satara	3538.3	214.69	68.37	162.44	-	B+C+G
9	Jaoli	3055.4	102.81	137.35	-	-	C+B
10	Patan	2782.38	230.96	108.44	270.33	-	B+C+G
11	Karad	2841.67	345.93	143.63	194.2	-	B+C+G
<b>Whole District</b>		<b>5073.66</b>	<b>491.96</b>	<b>52.46</b>	<b>10.86</b>	<b>102.70</b>	<b>C+B+G+S</b>

Source: Livestock Census, 2012 and Computed by the Researcher.

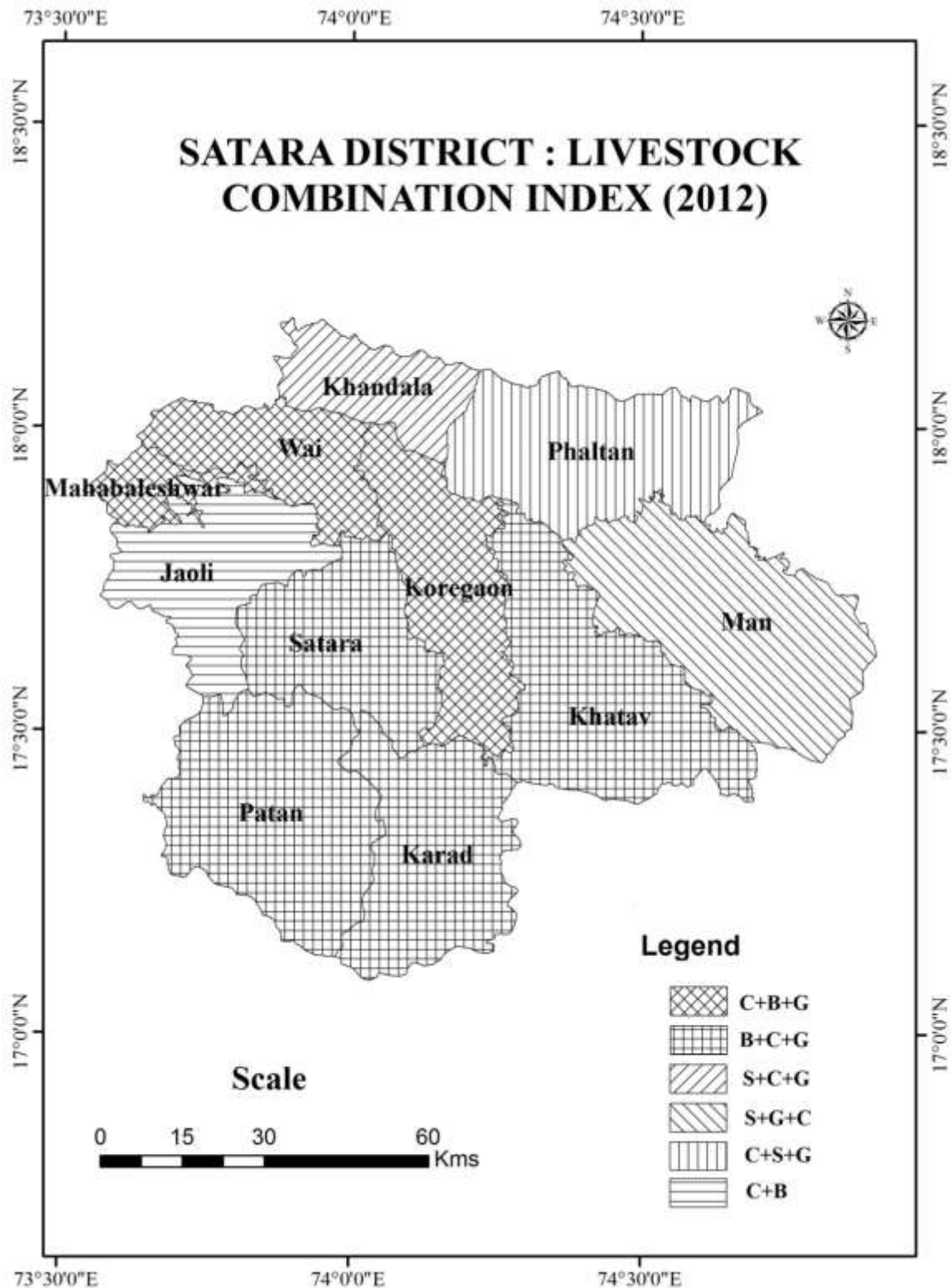


Fig. No. 2

### Three Livestock Combination

Table no.1 and fig. no. 2 indicate that the three livestock combination is recorded in all tahsils of the district except Jaoli tahsil, but the position of livestock combination varies from tahsil to tahsil in 2012.

**Cattle-Buffaloes-Goat Livestock Combination**

The cattle, buffaloes and goat i.e. C+B+G livestock combination was recorded in Mahabaleshwar, Wai, and Koregaon tahsils. These tahsils are located in hilly areas, high rainfall, dense forest leads to high carrying capacity of the livestock mainly cattle and buffalo and low development of agriculture.

and agro-base industries. The suitable climatic conditions with high rainfall tend to favour for rearing of cattle and buffalo in large numbers and included in the combination.

#### **Sheep-Cattle-Goat Combination**

#### **Livestock**

The livestock combination specialise in sheep, cattle and goat (S+C+G) type of animal to the segregation of all others was found in Khandalatahsil in 2012. Because of the Sheep and Goat areas rearing in the dry and low dense forest areas, there are suitable climatic and physiographic condition for the rearing of sheep and goat. Sheep, cattle and goat are figured in Khandalatahsil as a leading category of livestock. In the case of cattle region, the concentration of household commercial dairying in the vicinities of urban centres like Satara and Pune tended to favour and impetus more for the raising of milchcattle. While, in the case of sheep and goat of the region, the concentration of household commercial meat in the vicinities of urban centres like Satara and Pune tended to favour and impetus more for the raising of sheep and goat.

#### **Buffaloes-Cattle-Goat Combination:**

#### **Livestock**

This is another encountered i.e. buffalo, cattle and goat (B+C+G) livestock combination is found in Khatav, Satara, Patan and Karadtahsils in 2012. Karadtahsil is located in plain and fertile soil area leads to increase of irrigation, agriculture and agro-base industries resulted into rich economic condition of the people therefore there are high carrying capacity buffalo and cattle for milk and milk product and goat for meat. In Patantahsil is located in hilly area, undulating topography, moderate to dense forest resulted into low development of agriculture and agro-base industries but high carrying capacity of livestock. Cattle-buffalo-goat combination spread-eagled over buffalo dominated areas. Cattle-buffalo-goat combinations are identical which are associated with only three animal groups but the difference is in their relative positions. These three combinations are the most prevalent in all over the district and together accounted half of the total tahsils. It reveals that the buffaloes are raised either as first rank category or second rank category in the combinations is mostly meant for milk production either for existence or for commercial purposes but they are least

important in farm operations. While in the case of cattle, it is vice versa. It means most of the cattle rearing for draught force purpose and their importance in milk production is negligible. While, in the case of goat, it is means most of goat rising for drought force purpose and importance in meat production.

#### **Sheep-Goat-Cattle Regions:**

#### **Combination**

The livestock combination specialise in one type of animal to the exclusion of all others is found in sheep-goat-cattle. Sheep-goat-cattle livestock combinations are found in Man tahsil in 2012 due to the dry area, low development of irrigation as a leading category of livestock while sheep and goat exhibited in Man tahsil. In the case of cattle region, the concentration of household marketable dairying in the vicinities of urban centres like Karad and Satara tended to favour and impetus more for the raising of milchcattle.

#### **Cattle-Sheep-Goat Combination**

#### **Livestock**

This is another encountered to livestock combination is found in Phaltantahsil in 2012. Cattle-sheep-goat combination sprawled over cattle dominated areas of fertile black soil area and developed irrigation facilities with dry climate, flat region are the suitable for the rearing of the sheep and goat livestock. It reveals that the cattle are raised either as first or second rank category in the combinations which is mostly meant for milk production either for maintenance or for profitable purposes but they are least important in farm operations. Whereas, in the case of sheep and goat, it is vice versa. It means most of the sheep and goat rearing for draught force purpose and their importance in milk production is negligible and meat is main production.

#### **Four Livestock Combination**

Table no.1 indicate that the Satara district as whole had four livestock combination i.e. C+B+G+S (cattle, buffaloes, goat and sheep) and reasons are same as mentioned earlier.

#### **Conclusion**

The major livestock combination regions are identified on the basis of Weaver's method, the district as whole has three livestock combinations i.e. cattle, buffalo and sheep (C+B+G+S) in 2012. It is significant to state that cattle and buffalo have figured in all the livestock combinations

and in all the areal units by occupying the first two ranking positions. The two livestock combination i.e. Cattle and Buffalo is found in Jaolitahtsils in 2012 due to this tahsil is located in hilly area, high rainfall, dense and forest leads to high carrying capacity of the livestock mainly cattle and buffalo and low development of agriculture and agro-base industries. The three livestock combination i.e. Cattle, Buffalo and Goat was found in Mahabaleshwar, Wai, and Koregaontahsils in 2012 due to these tahsils are located in hilly area, high rainfall, dense and forest leads to high carrying capacity of the livestock mainly cattle, buffalo and goat and low enlargement of agriculture and agro-base industries. The sheep, cattle and goat (S+C+G) type of animal combination to the segregation was found in Khandalatahsil in 2012. Because of the Sheep and Goat areas rearing in the dry and low dense forest areas, there are suitable climatic and physiographic condition for the rearing of sheep and goat. The buffalo, cattle and goat (B+C+G) livestock combination was found in Satara, Patan and Karad tahsils in 2012. Karad tahsil is located in plain and fertile soil area leads to improvement of irrigation, agriculture and agro-base industries resulted into rich economic condition of the people, therefore there are high carrying capacity buffalo and cattle for milk and milk product and goat for meat. The sheep-goat-cattle livestock combinations are found in Man in 2012 due to the dry area, low development of irrigation as a leading category of livestock while sheep and goat exhibited in Man and Khandalatahsils.

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