: CHAPTER-IV :

SPATIAL STRUCTURE OF URBAN DISTRIBUTION

Types of distribution.

Methodology.

Factors influncing urban distribution.

Existing distribution of urban settlements.

Distribution of urban population.

Degree of urbanization and urban concentration.

Size distribution of urban centres.

Rank-size relationship of urban centres.

Spatial pattern of urban settlements.

Regional levels of development and distribution of urban settlements.

Today Geographers are often more interested in the internal organisation of a distribution and the location of the elements of the distribution with respect to each other. This kind of location is always relative. Geographers often talk about the ' Pattern ' of a distribution. In recent years internal relative location has been often called ' Spatial Structure'. The spatial Structure of a distribution is both, the location of each element relative to each of the others and the location of each element relative to all the others taken together. (Abler, Adams,Gould, 1971). The Spatial structure is a concept applicable to both static distribution and to processess which are dynamic. Process and structure are in essence, the same thing.

Geographers give more attention to the point of view of measurement and interpretation of the facts of the distributional phenomena. When we distinguish spatial process from spatial structure,we are simply recognizing a difference in relative rapidity of change.

TYPES OF DISTRIBUTION :

Distributions are of 3 types; discrete, continuous and contingent. Discrete distribution consists of an assemblage of different occurrences, a continuous distribution exists when occurrences are dependent, a contingent distribution occure when the magnitude of distribution is expressed in

terms of either area or type.

In this Chapter attempt has been made to study the factors influencing the distribution of urban settlements, their size, their relation with various factors of distribution and the levels of development.

METHODOLOGY:

In the present study various methods and techniques have been used to analyse the spatial structure and spatial process of urban distribution in which the technique of nearest neighbour analysis, rank size rule, shift analysis and various methods of studying degree of urbanization and urban concent - ration are important. An attempt has also been made to find out the levels of development in the study area. The details regarding the various methods and techniques are discussed in the text at appropriate places.

FACTORS INFLUENCING URBAN DISTRIBUTION :

There are various factors responsible for the origin, growth and distribution of urban settlements. Physical, Social and economic factors play important role in the growth and development of towns. Development of transportation, resource localization and industrial infrastructure are the other important factors which help in the growth of urbanization. Development of road transportation and concentration of

economic activities are the two important factors which give rise to the concentration of urban centres; thus distorting the distributional pattern. In spite of these factors market organization and the level of economic development of a region also influences the distribution of urban settlements.

EXISTING DISTRIBUTION OF URBAN SETTLEMENTS:

The study area is basically dominated by agrarian economy, where, 79.97 % population is living in rural settle - ments. The region has wide contrasts in topography, Soils, agriculture and the level of economic development. Considering these aspects, here attempt has been made to examine the influence of these factors on the spatial distribution of urban settlements.

The study area comprises of six districts of Maharashtra covering an area of 55,175 Sq.kms. and the population of 1,10,83,338 persons. There are 53 urban settlements which account for only 1.30 % of the total settlements. Out of the 57 Talukas , 35 Talukas possess urban settlements and remaining 22 Talukas are rural in character. The distribution of urban settlements with their names is shown in Fig. 1.4. The two districts of Konkan have 13 towns having 18.9 % of the urban population of study area. Kolhapur district has 12 towns where 22.5 % of the urban population of study area is found. Satara and Solapur, these two districts have 10 towns each accounting

for 18.0 % and 23.4 % of the total urban population of study area respectively. Sangli district has only 8 towns where 16.2 % of the total urban population of the area is found.

DISTRIBUTION OF URBAN POPULATION :

The spatial distribution of urban population has been studied by considering urban population density, degree of urbanization and urban concentration. The density of urban population has been studied by considering taluka as areal unit. Out of the 35 urban talukas, 20 talukas, namely, Khed, Dapoli, Chiplun, Rajapur, Kankawli, Vengurla, Malwan, Sawantwadi , Gadhinglaj, Panhala, Shahuwadi, Khanapur, Koregaon, Phaltan, Man, Sangola, Mangalvedha, Akalkot, Karmala and Madha have very low density of urban population (Fig. 4.2). Eleven talukas have a modarate density of 40 to 160 persons per Sq. km. They include Ratnagiri, Mahabaleswar, Wai, Satara, Karad, Tasgaon, Walawa, Shirol, Kagal, Pandharpur and Barsi talukas. Higher density of urban population is observed in Karvir, North Solapur, Miraj and Hatkanagle talukas (Table 4.1).

DEGREE OF URBANIZATION AND URBAN CONCENTRATION :

The degree of urbanization and the degree of urban concentration have been calculated by using simple equation, (Gibbs - 1966) where :-

$$\text{i) Degree of urbanization} = \frac{\text{Urban population of the areal unit}}{\text{Total population of the areal unit}} \times 100$$

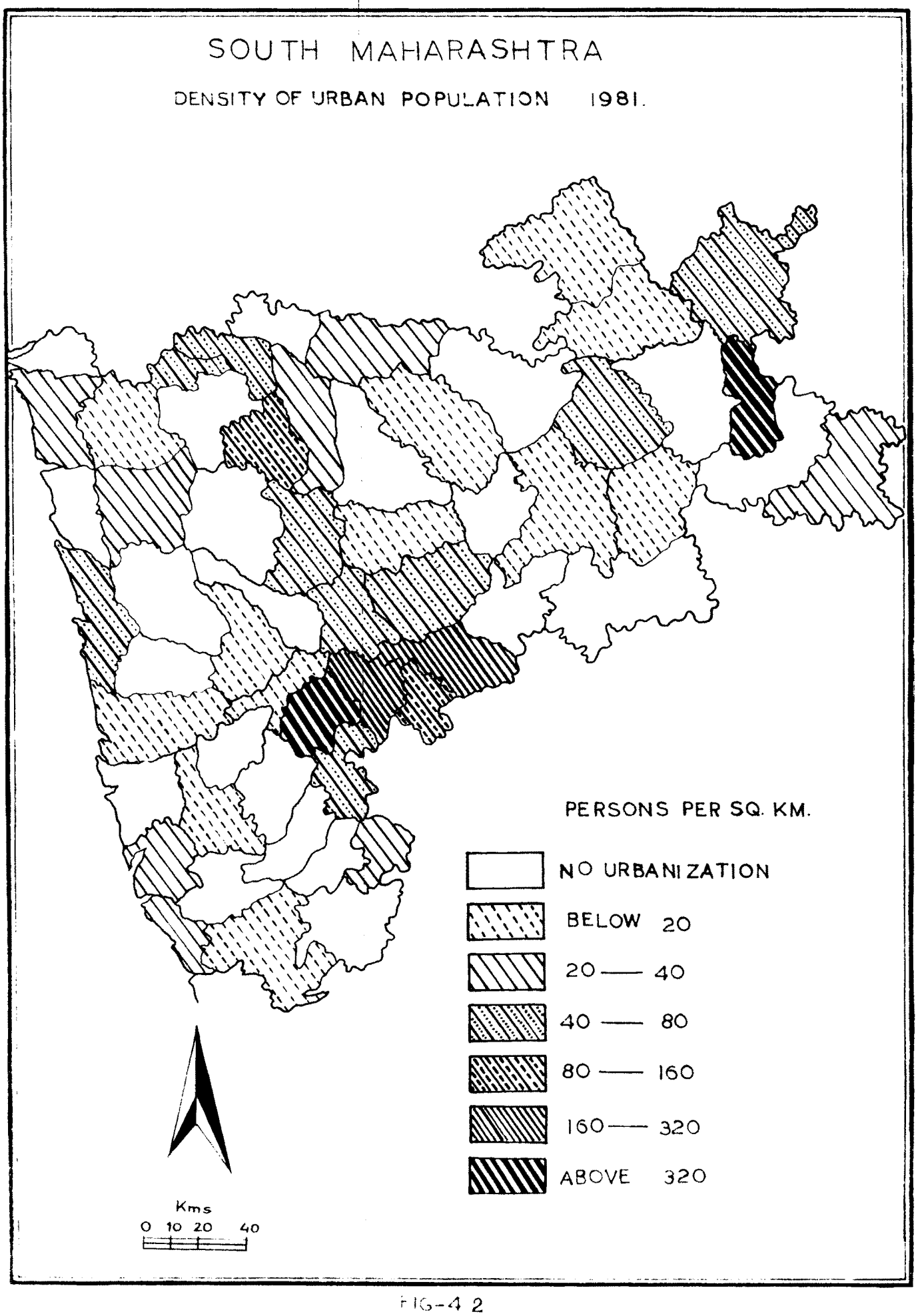
SOUTH MAHARASHTRA
DENSITY OF URBAN POPULATION 1981.
PERSONS PER SQ. KM.
NO URBANIZATION
BELOW 20
20 — 40
40 — 80
80 — 160
160 — 320
ABOVE 320
Kms
0 10 20 40

FIG-4.2

TABLE NO. 4.1.

Distributional Aspects of Urbanization 1981

Sr. No.	Name of Taluka	No. of towns	Urban Population	Density of Urban Population per Sq.Km.	Degree of Urbanization	Degree of Urban Concentration	Denisty of Population per Sq. Km.
1	2	3	4	5	6	7	8
1	Ratnagiri	1	47025	50.79	22.24	111	228
2	Guhagar	-	-	-	-	-	173
3	Dapoli	3	18893	22.31	11.70	58	189
4	Mandangad	-	-	-	-	-	149
5	Khed	1	10216	10.22	6.15	31	166
6	Chiplun	3	35345	31.41	16.50	82	190
7	Sangameshwar	-	-	-	-	-	146
8	Lanja	-	-	-	-	-	131
9	Rajapur	1	8884	6.92	5.26	26	132
10	Kankawli	1	2203	2.84	1.81	9	157
11	Kudal	-	-	-	-	-	158
12	Sawantwadi	1	18670	13.97	11.11	55	125
13	Vengurla	1	12368	37.72	14.14	71	261
14	Malvan	1	17319	26.11	14.51	72	180
15	Deogad	-	-	-	-	-	149
16	Satara	1	83604	91.34	28.58	143	320
17	Wai	1	24661	41.56	17.27	86	241
18	Khandala	-	-	-	-	-	157
19	Mahabaleshwar	2	17695	78.26	48.63	243	161

1	2	3	4	5	6	7	8
20	Koregaon	3	37128	39.32	19.48	97	202
21	Phaltan	1	33856	28.68	15.13	76	190
22	Man	1	14747	10.24	10.13	51	101
23	Khatav	-	-	-	-	-	154
24	Karad	1	54372	50.84	14.06	70	361
25	Patan	-	-	-	-	-	175
26	Jaoli	-	-	-	-	-	118
27	Miraj	3	268962	295.69	53.15	265	556
28	Tasgaon	2	46667	41.57	15.63	78	266
29	Khanapur	1	24073	18.50	11.01	55	168
30	Atpadi	-	-	-	-	-	96
31	Jath	-	-	-	-	-	85
32	Kavathe-Mahankal	-	-	-	-	-	138
33	Walawa	2	54334	69.84	18.15	91	385
34	Shirala	-	-	-	-	-	205
35	North Solapur	1	514461	698.71	83.62	417	836
36	Barsi	1	72769	44.75	26.32	131	170
37	Akalkot	3	47750	34.35	22.13	110	155
38	South Solapur	-	-	-	-	-	125
39	Mohol	-	-	-	-	-	113
40	Mangalwedha	1	16802	14.73	14.32	71	103
41	Pandharpur	1	64338	49.35	27.07	135	182
42	Sangola	1	14849	9.40	8.13	41	115
43	Malshiras	-	-	-	-	-	185
44	Karmala	1	16729	10.39	10.08	50	103
45	Madha	1	19566	12.66	9.41	47	134

1	2	3	4	5	6	7	8
46	Karavir	2	351073	523.13	58.51	292	1003
47	Panhala	1	2540	4.47	1.46	7	300
48	Hatkanagale	3	178404	292.75	41.76	209	701
49	Shirol	2	41079	80.88	16.69	83	485
50	Kagal	2	25146	45.93	13.72	69	334
51	Gadhinglaj	1	18535	38.52	10.60	53	363
52	Chandgad	-	-	-	-	-	140
53	Ajara	-	-	-	-	-	172
54	Bhudargad	-	-	-	-	-	168
55	Radhanagari	-	-	-	-	-	169
56	Bavada	-	-	-	-	-	102
57	Shahuwadi	1	4845	4.64	3.47	17	133
	South Maharashtra	53	2219908	40.23	20.03	-	201

Note: In the above table Degree of urbanization is the % of urban population to total population. The Degree of Urban concentration is calculated using the following formula.

$$DC = \frac{Pi}{PI} \times 100$$

Where Dc = Degree of urban concentration.

Pi = Percentage of urban population in an area unit.

PI = Percentage of urban population in study area.

..

ii) Degree of urban concentration = $\frac{\%\text{ of urban population of areal unit}}{\%\text{ of urban population of study area.}} \times 100$

Using the above equations degree of urbanization and urban concentration for all talukas have been obtained, further talukas have been classified in to various classes considering the standard index for the whole region (Table 4.1).

DEGREE OF URBANIZATION :

In the study area low degree of urbanization (below 25%) is found in 27 talukas. It means out of the total urban talukas 77 % have very low degree of urbanization. Out of these, only two talukas, Ratnagiri and Akalkot have degree of urbanization above the regional average, (20.03 %), Modarate degree of urbanization (25 % to 45 %) is observed in Satara, Pandharpur, Barsi and Hatkanagle, talukas, of the area under investigation. Higher degree of urbanization (above 45 %) is found in Karvir, Miraj, Mahabaleshwar and North Solapur talukas (Fig. 4.3).

DEGREE OF URBAN CONCENTRATION :

The simple equation of urban concentration is very much helpful in calculating the concentration of urban population. In this method when the values are less than 100, then the areas are supposed to have no concentration. But in the present study the author has considered the values which are less than 100 to show the poor concentration of urban population. Out of 35 urban talukas 25 talukas (71. %) have very poor

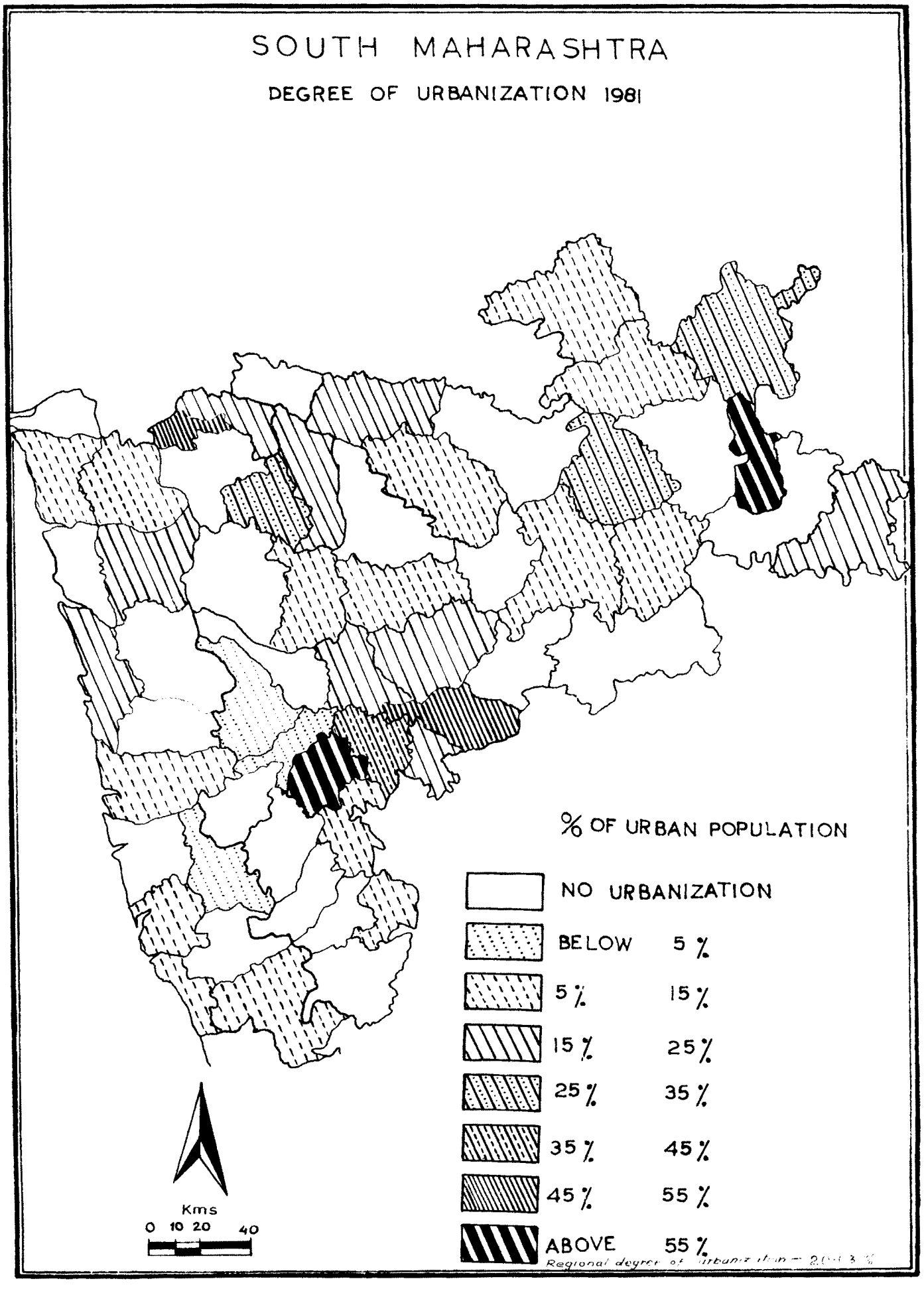
SOUTH MAHARASHTRA
DEGREE OF URBANIZATION 1981
% OF URBAN POPULATION
NO URBANIZATION
BELOW 5 %
5 % 15 %
15 % 25 %
25 % 35 %
35 % 45 %
45 % 55 %
ABOVE 55 %
Kms
0 10 20 40

FIG-4 3

concentration of urban population, where the degree of urban concentration is less than 100. (Fig 4.4). Low degree of urban concentration (100 to 250) is found in Ratnagiri, Mahabaleshwar, Satara, Hatkangale, Akalkot, Pandharpur and Barsi talukas. Modarat degree of urban concentration (250 to 350) is observed in Karvir and Miraj talukas only, while very high degree of urban concentration is observed in North Solapur taluka (417). There is only one urban centre in this taluka still it possess high concentration of urban population.

SIZE DISTRIBUTION OF URBAN CENTRES :

As per the census of 1981, towns have been classified into Six classes, based on their population size, where the lowest class of town has a population bellow 5,000 and the highest class order of town has a population above 1,00,000. In between these two classes the other four size groups of towns have been classified. The spatial distribution of towns in the study areaindicates that, according to 1981 census, there are 5 towns i.e. 9.2 % of the total towns are class I towns.Out of these 5 towns 4 towns, namely Kolhapur, Ichalkaranji, Sangli and Miraj are located in the lower part of upper Krishna valley in the range of 35 kms. Only one class I town, Solapur, is away from the agglomaration of class I town group. Satara, Karad, Pandharpur and Barsi are the class II towns of the study area. Of these towns Satara is a district head-quarter and remaining 3 are taluka head-quarters. Twleve towns are included in

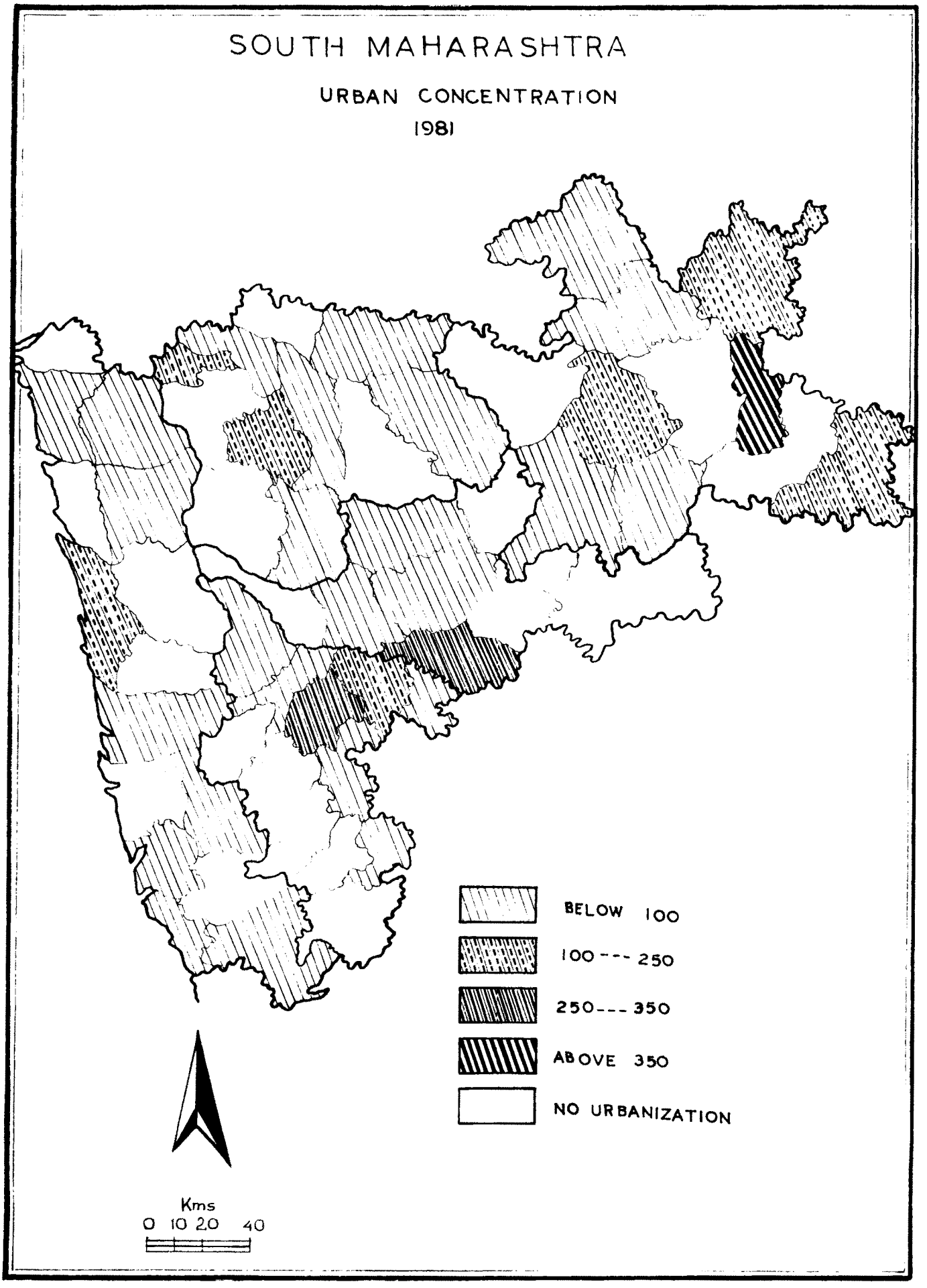
SOUTH MAHARASHTRA
URBAN CONCENTRATION
1981
BELOW 100
100 --- 250
250 --- 350
ABOVE 350
NO URBANIZATION
Kms
0 10 20 40

FIG-4·4

class III category. (Fig 4.5). The Spatial distribution of class III towns indicates that very high concentration of class III towns (67. %) is found in upper Krishna valley. Only 2 towns (16 %) are found in Konkan area and Bhima valley each. The spatial distribution of class IV towns indicates higher concentration in the upper Krishna valley. Out of the total 19 class IV towns 9 towns are located in Satara, Sangli and Kolhapur districts of upper Krishna valley. The Konkan region of the study area has 4 towns and the Bhima valley area has 6 towns of this class. The distribution of class V and class VI towns indicates a higher concentration of small towns in the Konkan part of study area. In two districts of Konkan there are 3 class V towns and 4 class VI towns. The next region of concentration of small towns is upper Krishna valley where 3 class V towns and 2 class VI towns are located. The Bhima valley region has only one class V town.

The regional pattern of class order distribution of towns indicates that Satara and Konkan districts are dominated by lower size order towns. Kolhapur and Sangli districts are dominated by class I,III and IV towns. In the Bhima valley area all classes of towns excepting class VI are found.

RANK SIZE RELATIONSHIP OF URBAN CENTRES :

Urbanization is a dynamic process. The growth of cities vary from place to place. Some cities grows with rapid rate than others. This process of urbanization reflects the spatial

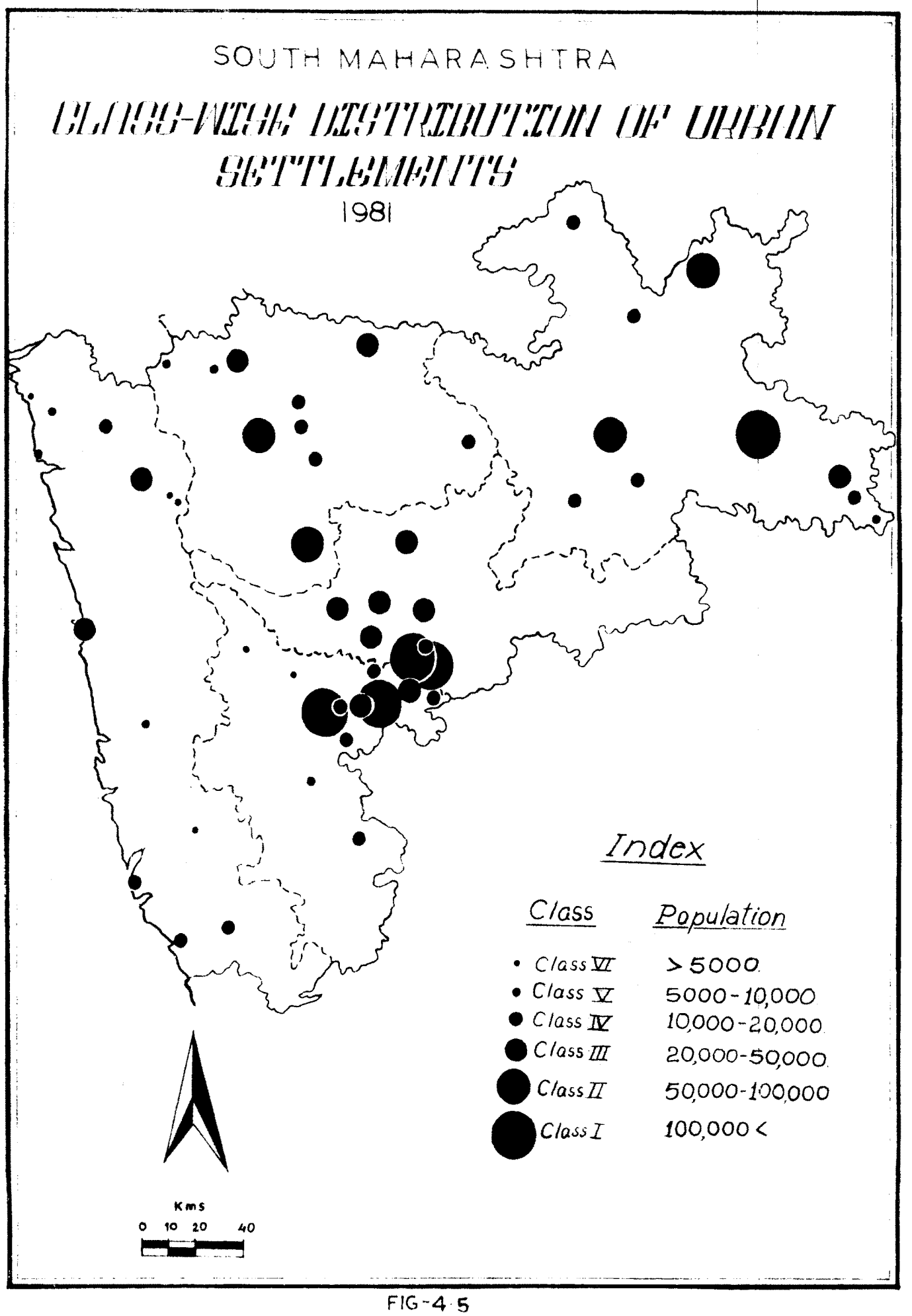
SOUTH MAHARASHTRA
CLASS-WISE DISTRIBUTION OF URBAN SETTLEMENTS
1981
Index
Class
Population
Class VI
> 5000
Class V
5000 - 10,000
Class IV
10,000 - 20,000
Class III
20,000 - 50,000
Class II
50,000 - 100,000
Class I
100,000 <
Kms
0 10 20 40

FIG-4.5

geographical structure of a region. All scientific enquires are pattern-and relation-seeking activity and the perception of pattern and order is a creative act where the pattern of relationship is more than a figment of imagination (Abler, Adams and Gould - 1971). In the present study attempt has been made to identify the rank-size relationship (Zipff,1949) between the urban centres in the study region. The rule has been applied to find out the actual size distribution and its expected size distribution of urban centres in study area.

The rank-size rule explains the relationships of urban centres in an area, where all the centres of the area if ranked in descending order of population size, the population of the Xth order town will be 1/xth, the size of the largest city and the population of other urban centres will be arranged in the following manner.

$$1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \text{----------} \frac{1}{X}.$$

The rank-size rule is an empirical observation. In any region there are many small towns, lesser number of medium size towns and very few large cities. This pattern of city size has been observed to be regular. When this rule is to be applied, care must be taken to see that the region is sufficiently large in size having similar geographical conditions spread over the entire region.

The rank-size distribution of urban settlements in the study area plotted on the log-log scale, clearly indicates that the actual population of first ranking city in the study area

is larger than the expected population by 5.3 %. At the same time the second ranking city, Kolhapur, whose actual population is 40.3 % greater than the expected population. (Table 4.2). The third ranking town Sangli indicates less population than the expected population by 5.8 % . Further 4th to 9th rank towns indicate higher actual population than the expected population. Towns from 10th rank to 53rd rank show less actual population than the expected population of theoretical model. Small towns from 47th rank onwards indicate much difference between the actual and expected population. The Fig. No.4.6 and 4.7 indicates the actual and expected rank - size distribution of towns in the study area.

SPATIAL PATTERN OF URBAN SETTLEMENTS :

The spatial pattern of urban settlements is characterised by their uneven distribution. It happens due to human choices of agricultural, industrial and commercial activities, which influences economic spatial structure. To study the patterns of distribution of urban settlements the statistical technique of ' nearest neighbour analysis ' evolved by plant ecologist (Clark and Evans - 1954) has been used. The technique indicates the degree to which any observed distribution of points deviate from the random distribution. The pattern of settlement distribution has already been studied by several geographers like Dacey (1962), Brush (1963), King (1962), Gettis (1954) and Reddy (1970).

The technique of nearest neighbour analysis is very

TABLE No.4.2

Rank-Size Relationship of Towns in South Maharashtra, 1981

Rank	Town	Reciprocal of Rank 1/R	Actual Pop. Pa	Expected Pop. Pe	Difference d=Pa-Pe	Difference as % of Pe (Pa-Pe)/Pe %
1	2	3	4	5	6	7
1	Solapur	1.00000	5,10,707	4,85,156	25,551	5.27
2	Kolhapur	0.50000	3,40,306	2,42,578	97,728	40.29
3	Sangli	0.33333	1,52,382	1,61,718	-9,336	-5.77
4	Ichalkaranji	0.25000	1,33,704	1,21,289	1,2415	10.24
5	Miraj	0.20000	1,05,436	97,031	8,405	8.66
6	Satara	0.16667	83,604	80,859	2,745	3.39
7	Barsi	0.14290	72,769	69,308	3,461	4.99
8	Pandharpur	0.12500	64,338	60,645	3,693	6.09
9	Karad	0.11111	54,372	53,906	466	0.86
10	Ratnagiri	0.10000	47,025	48,516	-1,491	-3.07
11	Phaltan	0.09091	33,856	44,105	-10,249	-23.24
12	Urun-Islampur	0.08333	33,001	40,429	-7,428	-18.37
13	Kabnur	0.07692	30,272	37,320	-7,048	-18.89
14	Akalkot	0.07143	28,371	34,654	-6,283	-18.13
15	Chiplun	0.06667	27,240	32,344	-5,104	-15.78
16	Tasgaon	0.06250	26,158	30,322	-4,164	-13.73
17	Wai	0.05882	24,661	28,539	-3,878	-13.59
18	Vita	0.05556	24,073	26,953	-2,880	-10.69
19	Jaysingpur	0.05263	24,002	25,535	-1,533	- 6.00
20	Ashta	0.05000	21,333	24,258	-2,925	-12.06

1	2	3	4	5	6	7
21	Kirloskarwadi	0.04762	20,509	23,103	-2,594	-11.23
22	Kurduwadi	0.04545	19,566	22,053	-2,487	-11.28
23	Sawantwadi	0.04348	18,670	21,094	-2,424	-11.49
24	Gadhinglaj	0.04167	18,535	20,215	-1,680	- 8.31
25	Malwan	0.04000	17,319	19,406	-2,087	-10.75
26	Kurundwad	0.03846	17,077	18,660	-1,583	-8.48
27	Mangalvedha	0.03704	16,802	17,969	-1,167	- 6.49
28	Karmala	0.03580	16,729	17,327	- 598	- 3.45
29	Kagal	0.03448	16,533	16,730	- 197	- 1.18
30	Sangola	0.03333	14,849	16,172	- 1,323	- 8.18
31	Mhaswad	0.03226	14,747	15,650	- 903	- 5.77
32	Koregaon	0.03125	14,595	15,161	- 566	- 3.73
33	VadagaonKasaba	0.03030	14,428	14,702	- 274	- 1.86
34	Vengurla	0.02941	12,368	14,269	-1,901	-13.32
35	Rahimatpur	0.02857	11,666	13,862	-2,196	-15.84
36	Madhavnagar	0.02778	11,444	13,477	- 2,033	- 15.08
37	Maindargi	0.02703	11,079	13,112	- 2,033	-15.50
38	Satara Road	0.02632	10,867	12,767	- 1,900	-14.88
39	Gandhinagar	0.02564	10,767	12,440	-1,673	-13.45
40	Khed	0.02500	10,216	12,129	-1,913	-15.77
41	Mahabaleshwar	0.02439	9,060	11,833	-2,773	-23.43
42	Rajapur	0.02381	8, 884	11,551	-2,667	-23.09
43	Panchagani	0.02326	8, 635	11,283	-2,648	-23.47
44	Murgud	0.02273	8, 613	11,026	-2,413	-21.88
45	Dudhani	0.02222	8,300	10,781	-2,481	-23.01

1	2	3	4	5	6	7
46	Dapoli Camp	0.02174	7,827	10,546	-27.19	-25.78
47	Dabhol	0.02128	6,363	10,322	-39.59	-38.35
48	Malakapur	0.02083	4,845	10,107	-52.62	-52.06
49	Pophali	0.02041	4,817	9,901	-5,084	-51.35
50	Harnai	0.02000	4,703	9,703	-5,000	-51.53
51	Alore	0.01961	3,288	9,513	-6,225	-63.49
52	Panhala	0.01923	2,540	9,330	-6,790	-72.38
53	Kanakavli	0.01887	2,203	9,154	-6,951	-78.14

n = 53 $\Sigma 1/R = 4.57566$ $\leqslant p = 2219908$ $\leqslant Pe = 2219797$ $\leqslant d = 308517$

$\leqslant \% = 1042.15$

$\bar{\bar{X}} = 41885.1$ $\bar{X} = 41882.9$ $\bar{\bar{x}} = 5821.1$ $\bar{x} = 19.65$

Note: The formula used for calculating the expected population of primier city (P_1) is as below :--

$$P_i \quad \frac{\leqslant P}{\leqslant 1/R}$$

..

Rank-size relationship

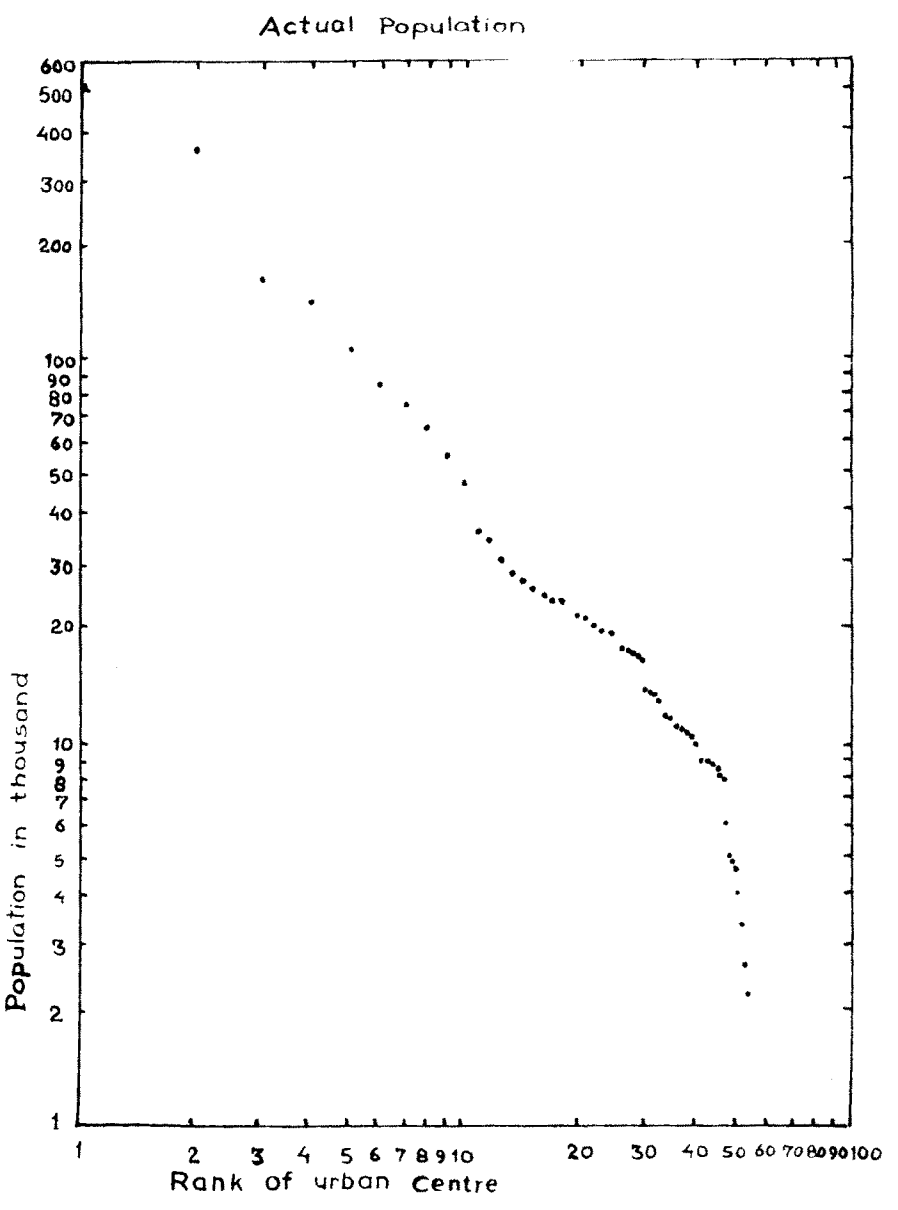

FIG-4-6

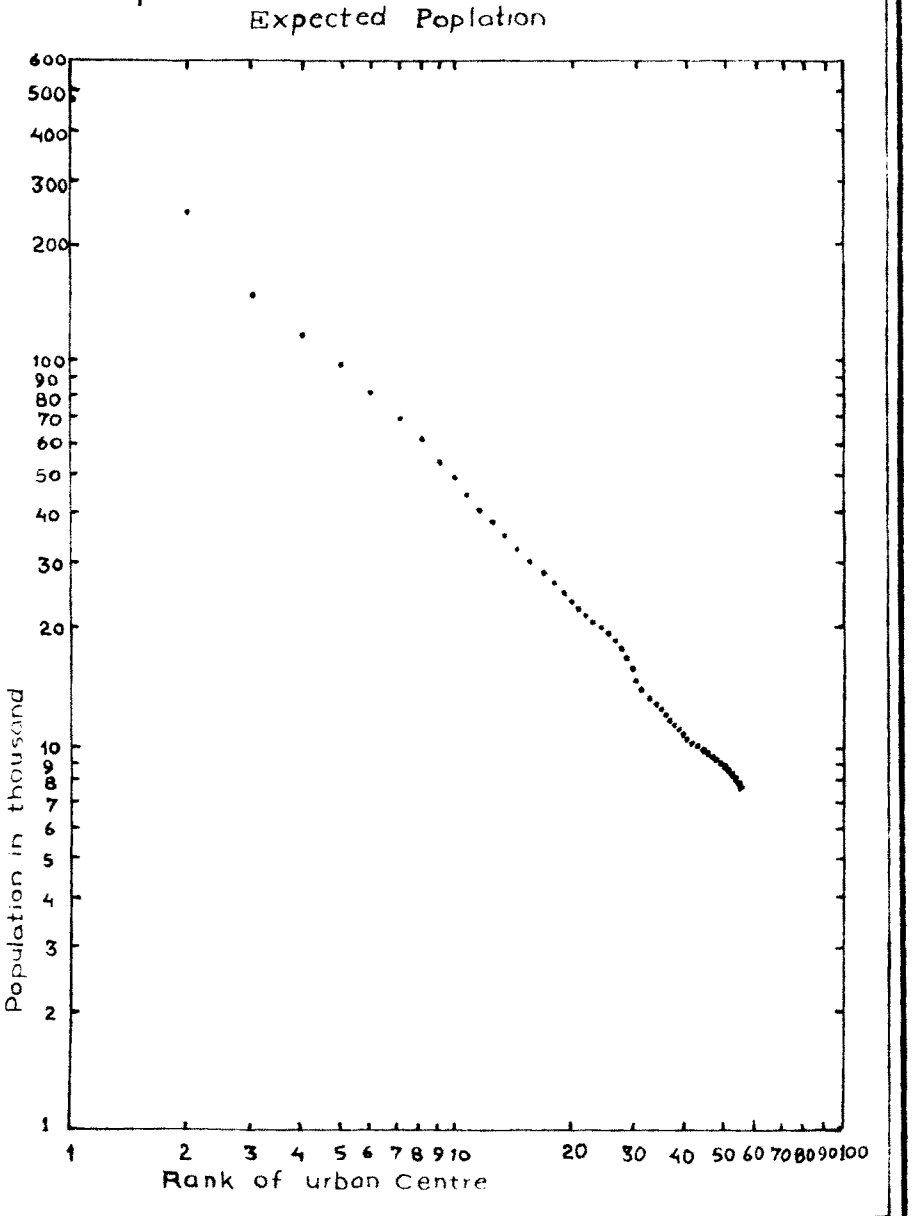

FIG-4-7

useful in studying point distribution pattern. The following equation is used in the present study.

$$R = \frac{\bar{D}\ obs}{\bar{D}\ ran} \quad - - - - - - - - - - - \quad I$$

Where " $\bar{D}$ obs " is measured mean distance between nearest neighbour points observed in a given area.

" $\bar{D}$ ran " is the expected mean distance for similar number of points random by distributed in the same area.

" R " is the nearest neighbour index.

$$\bar{D}\ ran = \frac{1}{2\sqrt{(N/A)}} \quad - - - - - \quad II$$

Where " N " is the number of urban settlements in the study region.

" A " is the area of spatial unit.

Hence

$$R = \frac{\bar{D}\ obs}{1 + (2\sqrt{(N/A)}} \quad - - - - - - - - - \quad III$$

It can be written in simplified form as :-

$$R = 2\ \bar{D}\ obs\ \sqrt{(N/A)} \quad - - - - - \quad IV$$

Using the above formula (Hammond and McCullagh, 1974) the nearest neighbour index is calculated for the physiographic

regions of the study area. Since the study area presents a visible contrast in the density pattern of urban centres it also indicates the contrast in the overall economic development. The entire region is divided in to 5 physical divisions and the ' R ' values have been calculated for each division.

The pattern of distribution has been studied by considering the revised ' R ' value scale given in the table No.4.3 .

Table - 4.3 :-- Revised ' R ' value scale

Sr.No	'R' value	Description
1	0 to 0.15	Absolute clustering
2	0.16 to 0.50	Liner clustering
3	0.51 to 0.80	Clusterd grouping
4	0.81 to 1.20	Random distribution
5	1.21 to 1.40	Near to uniform
6	Above 1.40	Uniform

The spatial pattern of distribution has been studied by dividing the region in to 5 broad physiographic divisions. The study area is divided in to following physiographic regions.

i) South Konkan region,

ii) Upland hilly region,

iii) Upper Krishna basin,

iv) Dry plateau region

v) Upper Bhima basin.

These five regions show contrasts in geographical, social and economic conditions. Table No.4.4 shows the salient features of five physiographic divisions of study area. It also indicates the 'R' values of the divisions.

TABLE -4.4 :- PERCENT SHARE OF VARIOUS FACTORS 1981 .

Division	% no of Towns	Area %	Urban Population %	Total Population %	Index of level of devp.	% of gross cropped area	Road density.	'R' value
1	2	3	4	5	6	7	8	9
South Konkan	24.07	23.60	7.70	19.03	95.07	10.77	44.66	1.38
Upland hilly region	7.41	15.27	1.13	12.40	86.87	10.36	25.45	0.91
Upper Krishna Basin	42.59	16.54	53.33	33.80	132.94	21.25	37.73	1.38
Dry Plateau region	7.41	20.23	3.94	12.89	86.99	23.54	17.07	1.84
Upper Bhima Basin	18.52	24.37	33.90	21.88	97.85	34.08	19.75	1.05
South Mahara-shtra.	100.00	100.00	100.00	100.00	---	100.00	----	1.14

The five physiographic divisions show wide contrasts in the distribution of urban settlements where, the degree of randomness diffres considerably.

The south Konkan region which covers 23.6 % area of the study region, having 7.7 % of urban population is poorly

developed area where only 10.7 % of the total cultivable land is available. The area has 13 urban settlements distributed in a ' nearer to uniform ' manner where, the degree of randomness is 1.37. The upland hilly region covers 15.27 % of the total area and only 1.13 % of urban population. The area has 4 urban settlements distributed randomly, where the degree of randomness is 0.91% . In this area nearly 82 % land has rough topography, irrigated land is limited and soils are poor.

The upper Krishna basin is the most prosperous part of the study area covering 16.54 % area and 53.33 % urban population is inhabited in 23 towns distributed in " nearer to uniform " manner. The degree of randomness is 1.38. The region has 21.25 % of the total cultivable land where land under irrigation is more than 30 % . The rich fertile soils supported by irrigation facilities have developed the agriculture of the region. The density of road net-work is also high. These all factors have promoted the growth of urban settlements in the area. (Fig. 4.8).

Dry plateau region has 4 towns uniformly distributed, where, the degree of randomness is 1.84. The region is characterised by very low density of road net-work and adverse climatic conditions.

In upper Bhima basin 9 towns of the study area are found to be distributed in a random manner. The basin covers an area of 24.37 % and urban population of 33.90 % . The market

SPATIAL DISTRIBUTION OF URBAN SETTLEMENTS

(NEAREST NEIGHBOUR ANALYSIS)

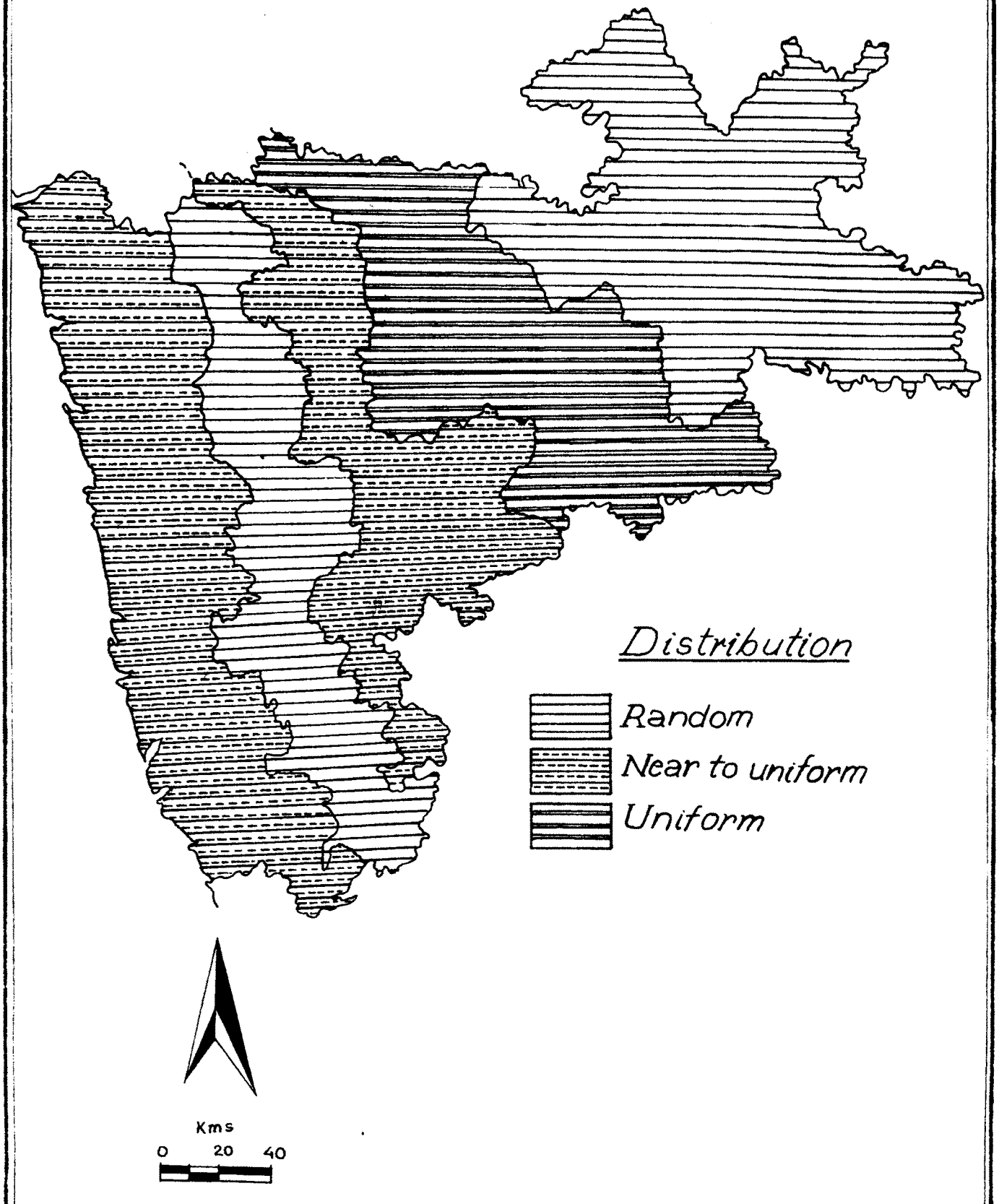

FIG-4.8

organization, development of agriculture and better road network are the controlling factors in the location of urban centres.

The entire study area has 53 towns distributed in a random manner where, the degree of randomness is found to be 1.14.

REGIONAL LEVELS OF DEVELOPMENT AND DISTRIBUTION OF URBAN SETTLEMENTS: -

In order to find out the relationship between the levels of development and distribution of urban settlements in the study area, levels of development have been calculated for each taluka using certain indices. The main driving force in regional socio-economic change is ofcourse the locational behaviour of productive activities within both, the manufactur - ing and service sector of economy (Chisholam, 1973).

The following variables were considered for calculating the levels of development :-

i) Percentage of irrigated land,
ii) Percentage of rural electrification,
iii) No of banking offices per lakh population,
iv) No of doctors per lakh population,
v) No of primary agricultural societies per lakh - population,
vi) No of veternary doctors per lakh livestock population,
vii) Percentage of workers engaged in secondary and tertiary activities to total workers.
viii) Percentage of litaracy,

ix) Percentage of area under cash crops,

x) Density of population per Sq.km.,

xi) Percentage of urban population to total population,

xii) Density of roads per 100 Sq.kms.

Following method has been adopted to calculate the levels of development:-

The Co-efficient of development of taluka in terms of single variable is calculated by the following equation :

Where --

$$I \text{ --- } CI = \frac{Pi}{PI} 100$$

"CI" is the co-efficient of development for variable I

"Pi" is the percentage of variable i in the areal unit.

"PI" is the mean percentage of variable i in the study region.

The summation of all indices gives the composit index of development by the following equation :

$$II \text{ --- } CID = \sqrt{\frac{CI_1 + CI_2 + CI_3 \text{ ------ } CIn}{N}}$$

Where "CID" is the composite index of development and

" N " is the number of variables.

Using above equations levels of development for all talukas have been calculated and are shown in the Table - 4.5 and dipicted in Fig 4.9. The spatial analysis of levels of

Table No.4.5

Composit Index of Development, 1981

Sr.No.	Name of Taluka	CDI	CID	$\sqrt{CID}$
1	2	3	4	5
1	Ratnagiri	1374	124.9	11.18
2	Guhagar	1065	96.8	9.84
3	Dapoli	1140	103.6	10.18
4	Mandangad	752	68.4	8.27
5	Khed	767	69.7	8.35
6	Chipalun	1071	97.4	9.87
7	Sangameshwar	950	86.4	9.29
8	Lanja	1038	94.4	9.71
9	Rajapur	724	65.8	8.11
10	Kankawali	917	83.4	9.13
11	Kudal	820	74.6	8.63
12	Sawantwadi	1704	154.9	12.45
13	Vengurla	1463	133.0	11.53
14	Malvan	1010	91.8	9.58
15	Deogad	891	81.0	9.0
16	Satara	1542	140.2	11.84
17	Wai	1288	117.1	10.82
18	Khandala	1233	112.1	10.58
19	Koregaon	1208	109.8	10.48
20	Phaltan	1279	116.3	10.78
21	Man	890	80.9	8.99

1	2	3	4	5
22	Khatav	883	80.3	8.96
23	Karad	1313	119.4	10.93
24	Patan	894	81.3	9.01
25	Jaoli	912	82.9	9.1
26	Mahabaleshwar	1837	167.0	1292
27	North Solapur	2179	198.1	14.07
28	Barsi	1020	92.7	9.63
29	Akalkot	1277	116.1	10.77
30	South Solapur	737	67.0	8.18
31	Mohol	752	68.4	8.27
32	Mangalvedha	1130	102.7	10.14
33	Pandharpur	1176	106.9	10.34
34	Sangola	1294	117.6	10.85
35	Malshiras	995	90.5	9.51
36	Karmala	733	66.6	8.16
37	Madha	764	69.5	8.33
38	Miraj	1993	181.2	13.46
39	Tasgaon	1331	102.8	10.14
40	Khanapur	831	75.6	8.69
41	Atpadi	859	78.1	8.84
42	Jath	584	53.1	7.29
43	Kavathe Mahankal	758	68.9	8.30
44	Walwa	1311	119.2	10.92
45	Shirala	829	75.4	8.68
46	Karavir	2408	218.9	14.8

1	2	3	4	5
47	Panhala	1054	95.8	9.79
48	Hatkanagale	1619	147.2	12.13
49	Shirol	1504	136.7	11.69
50	Kagal	1076	97.8	9.89
51	Gadhinglaj	1155	105.0	10.25
52	Chandgad	726	66.0	8.12
53	Ajara	857	77.9	8.83
54	Bhudargad	952	86.5	9.30
55	Radhanagari	829	75.4	8.68
56	Bavada	737	67.0	8.18
57	Shahuwadi	884	80.40	8.96

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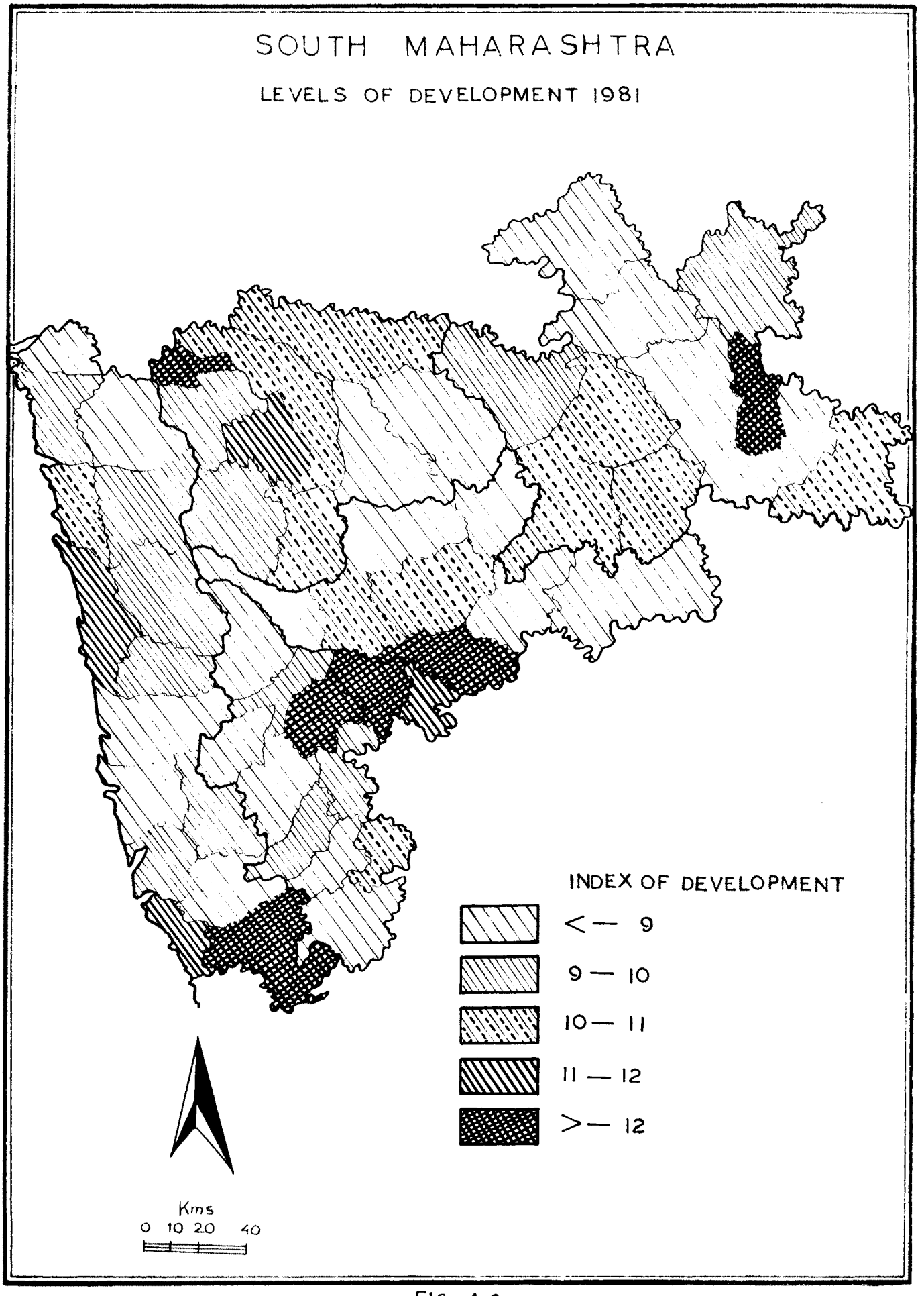
SOUTH MAHARASHTRA
LEVELS OF DEVELOPMENT 1981
INDEX OF DEVELOPMENT
<— 9
9 — 10
10 — 11
11 — 12
>— 12
Kms
0 10 20 40

FIG-4.9

development shows that, most of the talukas from hilly area and dry plateau region have very low level of development. In the study region out of the 57 talukas 34 talukas are poorly developed, where,19 towns of the area are located. In terms of percentage it covers 60 % of the area and 36 % of the total towns. Modarate level of development is found in 13 talukas, where, 17 urban settlements are located. It occupies 22.8 % of the area and 32 % of towns of the study area. Ten talukas of the region indicate better level of development, where,17 urban settlements having more percentage of higher class order are found. Better developed area occupies only 17.2 % of talukas but it has a share of 32 % of towns.

The relationship between the level of development and percentage of urban population is shown in the scatter diagram (Fig 4.10) . The scatter graph indicates very high Co-relation between these two factors, where the ' r ' value is 0.70 which indicates high positive co-relation.

Summarising the characteristic features of the distribution of urban settlements, it is observed that apart from relif and surface configuration other factors like agricultural developments, population density, transport network, resource localization and level of economic development, play an important role in the distribution urban settlements.

It is observed that the urban settlements are widely spaced and relatively small in size are found in the areas with

Relationship between Level of development and Degree of urbanization.

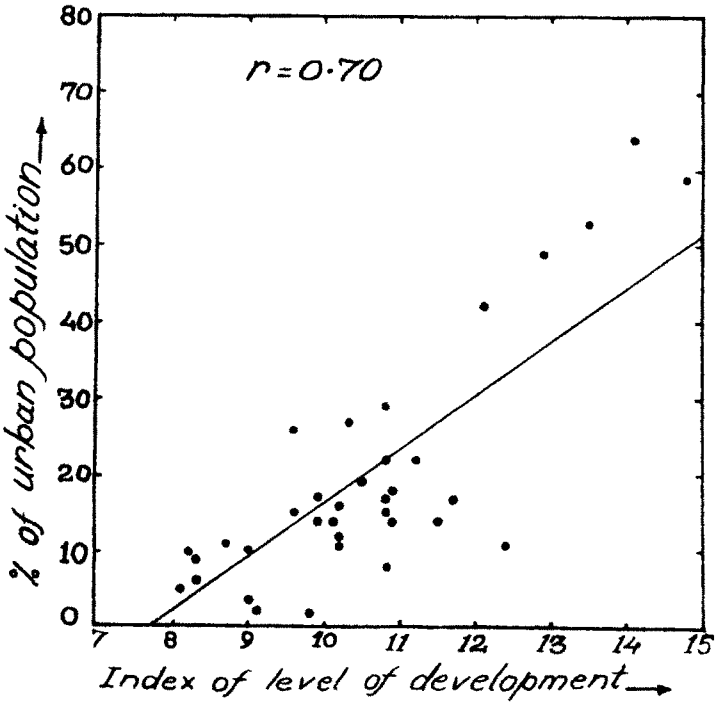

FIG-4·10

poor level of development and lower density of population. In better developed areas they are more closely spaced and their size is relatively large.

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CHAPTER-V

DYNAMICS OF OCCUPATIONAL CHARACTERISTICS

1 Changes in classification system, since independence.

2 Comments on 1981 census.

3 Methodology.

4 Trends of changes in occupational characteristics.

5 Classification of town groups.

6 Analysis of town groups 1951, 1961, 1971, 1981.

7 Functional classification of towns.

8 Review of methods of classification.

9 Choice of method for classification of towns.

10 Functional analysis of towns, 1951, 1961, 1971.

11 Functional analysis of towns 1981.

Much has allready been written about the occupational characteristics of towns in India. Yet our knowledge of that subject remains far from adequate. There are several reasons for this. First,because the available studies are based on the census data which has verious short-commings in the economic sphere. Second, because for reason of public and social policy the relationship between cast and occcupation ; still a fundamental one in modern India, can no longer be a subject for general investigation. Finally and most important, it considers the occupational structure as a function of economic development at all levels of study. A comparative analysis of the occupational structure based on census data possess several difficulties, because of the changes in the classification of workers incorporated by census from time to time. The census authorities, while classifying major occupational groups, have changed the grouping of working population. When one tries to analyse the temporal changes in occupational characteristics, comparision becomes some what vague.

CHANGES IN CLASSIFICATION SYSTEM SINCE INDEPENDENCE :

The occupational classification of workers according to 1951 census indicates several errors attributed to a phenomenal which might be called " Category Climbling ",because of this it becomes impossible to determine from the statistics the allocation of labour according to the scale of enterprise.

Following are the groups of occupation classified according to 1951 census.

AGRICULTURAL CLASSES -

1] Cultivators of land wholly or mainly owned and their dependents.

2] Cultivators of land wholly or mainly un-owned and their dependents.

3] Cultivating labourers and their dependents.

4] Non-cultivating owners of agricultural rent recivers and their dependents.

NON-AGRICULTURAL CLASSES -

Persons including dependents who derive their lively hood from :-

5] Production other than cultivation.

6] Commerce.

7] Transport.

8] Other services and miscellaneous sources.

In this classification the population engaged in agriculture can be considered resonably reliable, but one cannot place great faith in the other agricultural classes. Apart from agricultural classes with regard to both secondary and tertiary sectors, it is observed that it would impossible to determine from the statistics the allocation of labour force. Further it is worth noting that the 1951 census classification includes dependent population as part of working population.

In 1961 census, authorities have classified the working

population considering the Indian economy and it is formed with far greater realization than the census of 1951.Following were the occupational categories of workers according to 1961 census.

1] Cultivators.

2] Agricultural labourers.

3] Mining, quarrying, livestock, forestry, fishing, hunting and plantation orchards and allied activities.

4] House-hold industry.

5] Manufacturing, other than household industry.

6] Construction.

7] Trade and commerce.

8] Transport, storage and communication.

9] Other services.

In 1961 census, workers are classified in to 9 classes of occupation, where agricultural category, which was classified in to four groups in 1951 census, was clubbed in-to two groups in 1961. Further in 1961 census the occupation "Production other than cultivation" is divided into three classes i.e. one - mining, quarrying, livestock, forestry, fishing and plantation, second house-hold industry and third manufacturing other than household, industry. Apart from this, 1961 census classification has added construction, trade and commerce, transport, storage and communication as specific classes of occupation. The Classi--fication of occupations according to 1961 census seems to be more rational than that of 1951.

In 1971, census authorities have added one more category, where they have separated mining and quarrying from livestock, forestry, fishing and hunting category of 1961 census.

The rational line of classification of workers followed by 1961 and 1971 census was drastically modified by census authorities in 1981 census year. According to 1981 census the workers are classified into following categories.

1] Cultivators,
2] Agricultural labourers.
3] Household industry (manufacturing, processing, servicing and repairs).
4] Other workers ,
5] Marginal workers.

The detailed explanation of basis of classification of working population given by census authorities is as follows:-

CULTIVATORS:

A person working as cultivator if he is engaged either as employer, single worker or family worker in cultivation of land owned or held from government or from private person or institution for employment in the form of money, kind or share. The cultivation includes plaughing, sowing, harvesting, and production of crops. It dose not include fruit growing, vegetable growing or planlation agriculture.

AGRICULTURAL LEBOURES:

A person working in other person's land for wages in

money, kind or share is agricultural labourer.

HOUSEHOLD INDUSTRY:

The main characteristics of household industry are the following:-

i) One or more members of the household must participate in the work and hired labour must be minimum.

ii) The activity should relate to some production, processing, servicing, repairing or making or selling of goods.

iii) The goods produced should not be for the consumption of household but should be wholly or partly for sale.

iv) In the urban areas the industry must be in the premises of house in which the household lives. But in rural areas industry may be any where within the limits of the village.

v) The activity should not be on the scale of registered factory.

vi) The profession such as pleader, doctor, barber, musicians etc. will not be included in household industry.

The following workers should be classified as 'Other Workers ' and not ' household industry '.

i) Plantation work .

2) Livestock maintainance and production.

3) Hunting, trapping and selling .

4) Forestry and logging.

5) Fishing and allied activities.

6) Mining and quarrying .

In the previous census all these activities were considered to be primary activities. In 1981 census these activities are treated as a part of tertiary activities and included in 'Other Workers '.

OTHER WORKERS:

According to 1981 census most of the urban places have a higher percentage share of ' Other Workers ' activity. This category includes all workers who have been engaged in some economic activity during the last one year and who are not cultivators, Agricultural lebourers or workers in 'HHI'. The type of workers come under this category include factory workers, plantation workers, persons engaged in trade and commerce, transport,mining, construction, political or social work, all Government servants, employees of local bodies,teachers, priests, artist etc.

MARGINAL WORKERS:

It is a new class developed in the 1981 census. It includes the persons who did the work during the last year but whose contribution in terms of days worked amounted to less than 6 months, such persons are classified as 'Marginal Workers'.

COMMENTS ON 1981 CENSUS:

Looking in to the changes in the mining, quarrying, live-stock, fishing and forestry activity the present classification treats all these activities as productive and processing activities which are operated on large scale and their nature

has totally changed from ' Subsistance form ' to 'Commercial activity '.

METHODOLOGY:

Looking in to the changing nature of the classification of working population it becomes almost impossible to analyse the changes in occupational characteristics. How ever in the present study an attempt has been made to analyse the post-independence trend of change in working population in the study area. In the present study changes in the occupational characteristics into broad division of primary ,secondary and tertiary structure has been done by preparing the trilinear charts. To indicate the dynamics of change the graphs have been drawn to analyse the shift of population from one sector to another. Since there are moderate changes in the occupational classification, up to 1971, the shift of occupational change is analysed only for 1951, 1961 and 1971 census periods. The data of 1981 census is individually analysed. Further it was thought that the functional classification of towns can also clearly indicate the changes in occupational characteristics. Hence the functional analysis has been delt with for all census years since, independence for which ' Nelson's' method of 'Service classification ' of towns has been adopted (Nelson - 1955).

TRENDS OF CHANGES IN OCCUPATIONAL CHARACTERISTICS :

"In case of India it is difficult to believe that the decline in the secondary and tertiary sectors during the pre-independence period indicates that, the nation was not felling to develope but actually regressing in the economic sence. The

major cause of this, the dominance of ' Jajmani' system is declining. Due to gradual replacement of costomary economic ties by market tranzaltions. Hence the phases of development in India appear to be accompanied by occupational trends. The economic activity classified into primary, secondary and tertiary is amenable to analyse. The aggregation of economic activity and their division into three broad categories seems to be unfit in the structure of economy '. Bauera and Yame point out that ' the break-down within the primary sector is completely dominated by the agricultural classes and from this one cannot make out how many people are engaged in a particular activity. Same is the case with the secondary and tertiary sectors."

In the study area when the shift from primary to secondary or tertiary or visa-versa is measured for all towns for the period of 1951.to 1971, It was observed that some towns indicate a considerable chang in the population shifting from one sector to another of occupation. For analysis the author has divided towns in to three groups according to the rate of change (Fig.5.1)

TOWNS SHOWING HIGH OCCUPATIONAL CHANGE:

There are 20 towns namely Karad, Phaltan, Mhaswad and Mahabaleshwar from Satara district, Gadhinglaj, Kagal, Panhala, Jaysingpur, Ichalkaranji and Gandhinagar from Kolhapur district, Ratnagiri, Vengurla, Pophali, Harnai, Malwan and Chiplun from Konkan districts, Dudhani, Akalkot and Maindargi from Solapur district and Vita from Sangli district. All these towns indicates considerable change in their occupational structure.

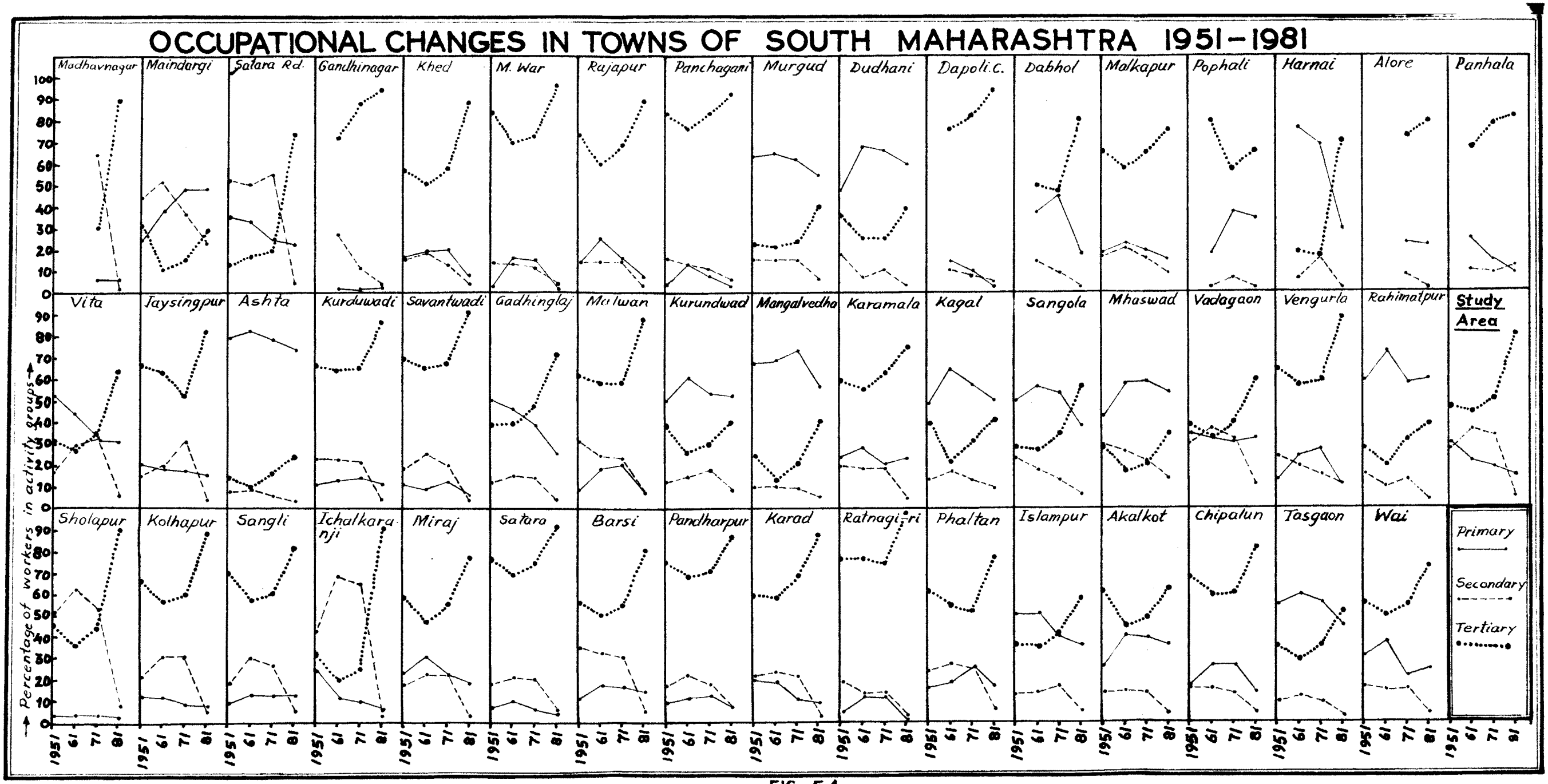
OCCUPATIONAL CHANGES IN TOWNS OF SOUTH MAHARASHTRA 1951-1981
Madhavnagar
Maindargi
Satara Rd.
Gandhinagar
Khed
M. War
Rajapur
Panchagani
Murgud
Dudhani
Dapoli C.
Dabhol
Malkapur
Pophali
Harnai
Alore
Panhala
Vita
Jaysingpur
Ashta
Kurduwadi
Savantwadi
Gadhinglaj
Malwan
Kurundwad
Mangalvedha
Karamala
Kagal
Sangola
Mhaswad
Vadagaon
Vengurla
Rahimatpur
Study Area
Sholapur
Kolhapur
Sangli
Ichalkaranji
Miraj
Satara
Barsi
Pandharpur
Karad
Ratnagiri
Phaltan
Islampur
Akalkot
Chipalun
Tasgaon
Wai
Primary
Secondary
Tertiary
Percentage of workers in activity groups
1951
61
71
81

FIG - 5.1

TOWNS WITH MODARATE CHANGE:

There are six towns which indicates modarate change in their occupational structure. They include Sangli and Islampur from Sangli district, Barsi and Sangola from Solapur district and Kurundwad and Rahimatpur from Kolhapur and Satara districts respectively.

TOWNS WITH LITTLE CHANGE IN OCCUPATIONAL STRUCTURE:

This group includes most of the established towns of the area showing very little change in their occupational pattern. This category includes 18 towns of which five towns, Solapur, Pandharpur, Kurduwadi, Mangalwedha and Karmala are from Solapur district, Kolhapur, Vadagaon Kasaba, Murgud and Malakapur from Kolhapur district, Miraj ,Tasgaon and Ashta from Sangli district, Satara ,Wai ,Panchagani from Satara district and Rajapur ,Sawantwadi and Khed from Konkan districts.

The changes in occupational characteristics and their regional distribution indicates that most of the Konkan towns, excepting Khed, Sawantwadi and Rajapur show higher change in the occupational characteristics. Similarly newly created towns also show considerable changes in their occupational structure.

CLASSIFICATION OF TOWN GROUPS:

To examine the relationship patterns fromed by the primary, secondary and tertiary activities of working population the tri-angular graph is used. The graph is capable of showing three variabls expressed as percentages adding upto 100. It helps to process and compare the data. It also differentiate the

occupational pattern of the towns of the area. In the present study the town groups according to occupational pattern have been studied for all the decades since independence.

ANALYSIS OF TOWN GROUPS (1951):

The Fig No.5.2 indicates the town groups based on the occupational data of 1951 census. The 42 towns of the area when plotted on the trilinear chart they are groupped into six town groups. Group one includes three towns namely Ashta,Mangalvedha and Murgud. These three towns have a high dominance of primary activity and modarate dominance of tertiary activity.

The second group includes Rahimatpur,Tasgaon, Vita, Gadhinglaj, Islampur,Kurundwad,Kagal,Dudhani ,Sangola and Mhaswad towns of the area. This group shows the dominance of primary and tertiary activity.

The third group include five towns namely Wai,Akalkot, Miraj, Karmala and Karad where, primary and tertiary activities are found to be modarate.

The fourth group of towns includes fifteen towns of the area where, the dominance of tertiary factor is more as compared to other two factors. It includes Jaysingpur,Chiplun,Malkapur, Khed,Rajapur, Phaltan,Pandharpur,Satara,Ratnagiri,Sawantwadi, Sangli, Kolhapur ,Vengurla,Malwan and Kurduwadi.

The fifth group includes only two towns Mahabaleshwar and Panchagani where,very high dominance of tertiary activity is found.

The group sixth also includes two towns namely,

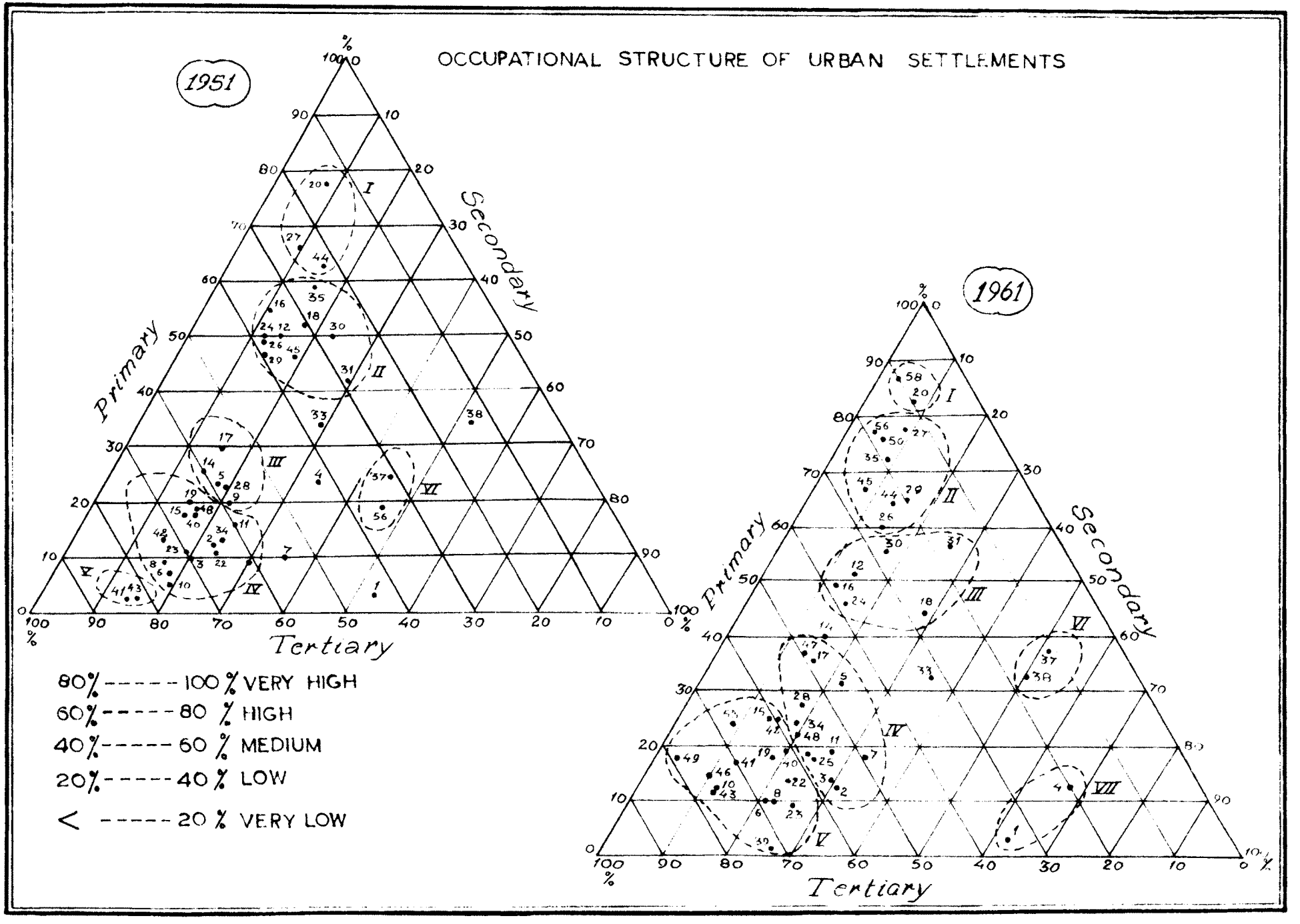
OCCUPATIONAL STRUCTURE OF URBAN SETTLEMENTS
1951
1961
Primary
Secondary
Tertiary
80% ----- 100 % VERY HIGH
60% ----- 80 % HIGH
40% ----- 60 % MEDIUM
20% ----- 40 % LOW
< ----- 20 % VERY LOW

FIG-5.2

FIG-5.3

Maindargi and Nate, where, Primary and Secondary factors are dominant.

In the study area Solapur, Barsi, Ichalkaranji , Vadagaon - Kasaba and Satara road, these five towns are found in isolation. Of these towns , Solapur has one factor medium. Barsi and Ichalkaranji has two factors medium, Vadagaon Kasaba has three factors low while Satararoad has two factors medium. Out of these five towns Solapur , Ichalkaranji and Satararoad are the industrial towns of the area.

ANALYSIS OF TOWN GROUPS (1961):

The 1961 occupational data divides towns into seven groups (Fig.5.3) Group one includes two towns Ashta and Redi, where, very high dominance of primary activity is found. Second group includes eight towns namely Nate, Harnai, Kagal, Rahimatpur, Dudhani, Mangalwedha, Murgud and Kurundwad. All these towns show high dominance of primary activity. The third group includes six towns of the area where, two factors, primary and tertiary have moderate dominance. They are Tasgaon, Islampur, Gadhinglaj, Sangola, Mhaswad and Vita,. The fourth group of towns, where two factors, secondary and tertiary are modarately dominant, includes Dabhol, Wai, Miraj, Karmala, Vengurla, Malakapur, Karad, Phaltan, Malwan, Sangli, Kolhapur and Barsi. The fifth group of towns includes fourteen towns of the area where, one factor i.e. tertiary is dominant .They are Pophali, Dapoli camp, Ratnagiri, Panchagani, Mahabaleshwar, Satara, Pandharpur, Sawantwadi, Kurduwadi, Khed, Jaysingpur, Panhala, Chiplun and Rajapur. Sixth group where, primary and secondary factors are moderately dominant, includes maindargi, and Satara road, towns of the area.

The seventh group of towns includes Solapur and Ichalkaranji, two industrial towns of the area where high dominance of secondary activity is found.

There are only two towns, Vadagaon Kasaba and Akalkot which are found in isolation. Akalkot has modarate dominance of primary activity and Vadagaon Kasaba founds to be located where, three factors are low.

ANALYSIS OF TOWN GROUPS (1971):

The 1971 census data when plotted on trilinear chart classifies the towns in to eight groups. Group one includes Ashta, Bhade, Mangalwedha,Harnai ,Dudhani,Shiregaon and Murgud towns of the area where,primary activity indicates high dominance. The second group, where primary and tertiary activity dominates modarately includes six towns of the area.They are Tasgaon,Kagal,Rahimatpur, Sangola,Kurundwad and Mhaswad. The third group includes Pophali,Akalkot,Islampur,Gadhinglaj,Wai, Patan Chiplun, Vengurla,Miraj ,Phaltan,Malwan,Sangli,Barsi, Jaysingpur and Kolhapur towns of the area where, high dominance of tertiary activity and modarate dominance of secondary activity is found. The fourth group includes thirteen towns, where one i.e.tertiary activity is found to be highly dominant. The following towns are included in this group.Alore,Khed, Karamala,Malakapur, Panhala,Mahabaleshwar,Ratnagiri, Rajapur, Kurduwadi, Pandharpur,Karad,Satara and Sawantwadi. The fifth group of towns, where tertiary occupation is very highly dominant,includes Humbarli,G.T.Helwak,Dapoli camp, Panchagani and Gandhinagar towns of the area. The sixth group of towns,

where, three factors are low includes Vita, Vadagaon Kasaba and Sadashivgad towns of the area. The seventh group of towns, where tertiary and secondary factors are found to be modarate includes Redi and Satararoad towns. The last group includes two towns, Ichalkaranji and Madhavnagar,where the secondary activity is highly dominant. The towns Solapur, Dabhol, Maindargi and Nate are found in isolation. The town Nate has very high dominance of primary activity. The town Dabhol is dominated by tertiary activity accompanied by primary activity. The town Maindargi has a dominance of primary and secondary activity while the town Solapur which was found in isolation in 1951 and was accompanied by Ichalkaranji in 1961, has become isolated in 1971, dominated by secondary and tertiary activity (Fig.No.5.4).

ANALYSIS OF TOWN GROUPS (1981):

The spatial analysis of occupational characteristics and their changes during the last three decades since independence can be compared with each other because there was very little change in the occupational categories to be included in primary secondary and tertiary sectors of occupational grouping. But in 1981, census, brought radical change in the grouping of occupational data. In the previous census livestock, forestry mining quarrying were considered as primary activities. At the same time the workers engaged in manufacturing activity were included in the secondary sector. But in 1981 the category of ' Other Workers ' includes the above mentioned activities and classified as workers engaged in tertiary activity. The details regarding the classification have been

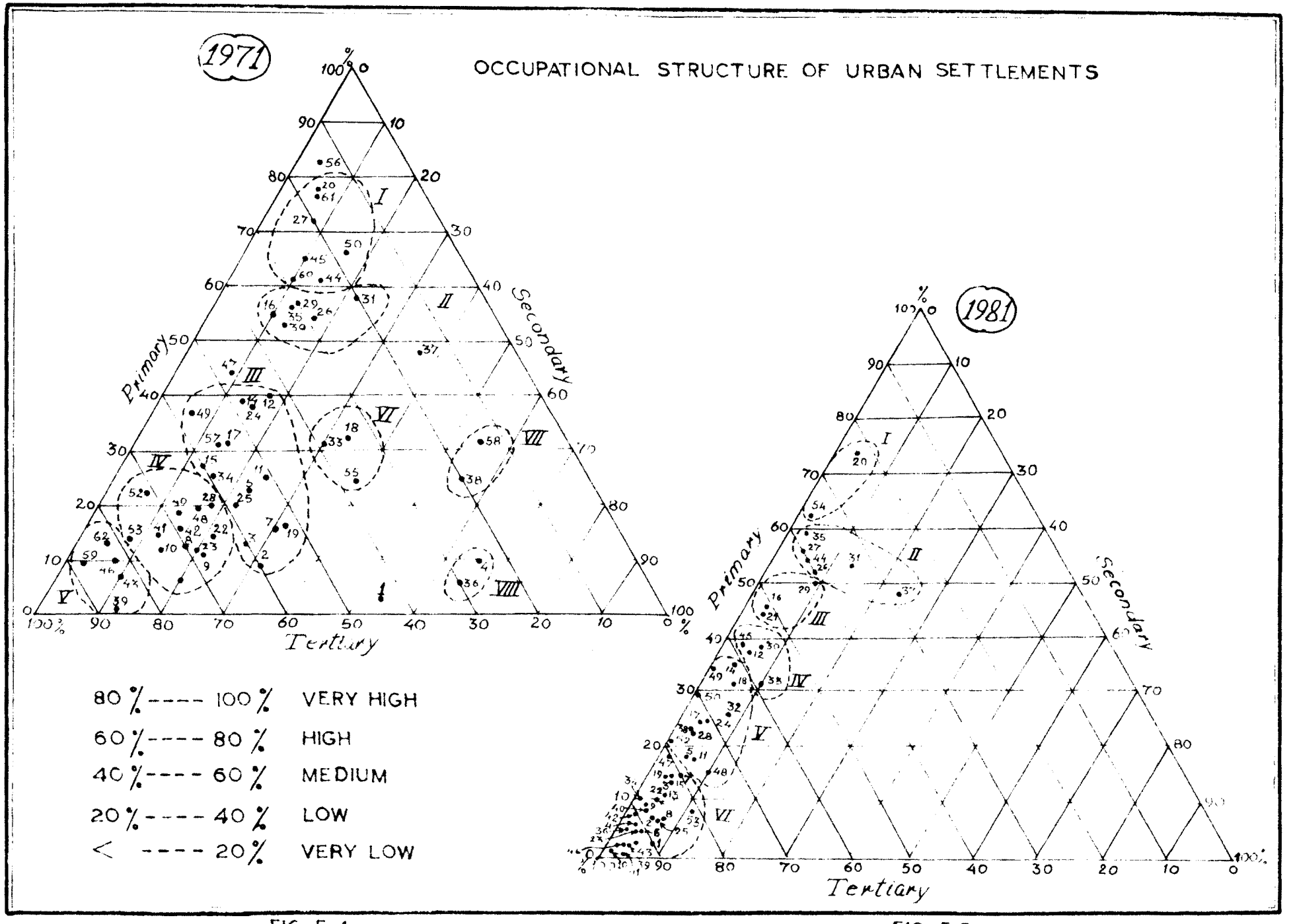
1971
OCCUPATIONAL STRUCTURE OF URBAN SETTLEMENTS
Primary
Secondary
Tertiary
80 % ---- 100 % VERY HIGH
60 % ---- 80 % HIGH
40 % ---- 60 % MEDIUM
20 % ---- 40 % LOW
< ---- 20 % VERY LOW
1981
Primary
Secondary
Tertiary

FIG-5.4

FIG-5.5

given in the text. As all these activities are included in ' Other Workers ' category the percentage of population engaged in tertiary activity has increased considerably in 1981. At the same time the percentage of population in the secondary activity shows decline. When the data of working population is plotted on trilinear chart it gives a pattern of distribution having resemblance to the urbanization on Atlantic Sea board (Fig.5.5).

All fifty three urban centres of the study area have been classified in to six groups of towns. Surprisingly not a single town is found in isolation. The first group includes Kanakawali and Ashta towns of the area, where ,very high dominance of primary activity is found. The second group includes six towns of the area namely, Rahimatpur,Mangalvedha, Murgud,Kurundwad, Mhaswad and Maindargi. All these towns are the ' Rururban Centres ' where primary activity is dominant. In this group,only one town Maindargi has highest percentage of secondary activity found in the study area. The third group includes towns; Kagal,Tasgaon and Kirloskarwadi ,where, one factor is medium accompanied by modarate second factor. In this group primary and tertiary activity have modarate share. The fourth group of towns includes Dudhani,Sangola, Islampur and Vadagaon Kasaba,where, two factors, primary and tertiary, are modaratly dominant. The fifth group having high dominance of tertiary activity includes 13 towns of the area. They are Akalkot, Pophali, Vita,Harnai,Wai, Gadhinglaj, Koregaon,Karmala, Satararoad, Alore, Miraj,Phaltan and Malakapur. The sixth and last group of towns includes 25 towns of the area, which comes

to 47 % of the total towns. All these towns indicates very high share of tertiary activity. All of them have more than 80 % population engaged in tertiary activity. The table No.5.1 gives the classification of towns according to the dominance of tertiary activity.

Table No.5.1.

TOWNS WITH PERCENTAGE OF POPULATION ENGAGED IN TERTIARY ACTIVITY.

Percentage of population engaged in tertiary activity		
Less than 50 %	50 % to 80 %	Above 80 %
1. Ashta	1. Karmala	1. Solapur
2. Kurundwad	2. Miraj	2. Kolhapur
3. Mangalwedha	3. Phaltan	3. Sangli
4. Kagal	4. Islampur	4. Ichalkaranji
5. Mhaswad	5. Akalkot	5. Satara
6. Rahimatpur	6. Tasgaon	6. Barsi
7. Maindargi	7. Wai	7. Pandharpur
8. Murgud	8. Vita	8. Karad
9. Dudhani	9. Jaysingpur	9. Ratnagiri
10. Kanakawali	10.Kirloskarwadi	10.Kabnur
	11.Gadhinglaj	11.Chiplun
	12.Sangola	12.Kurduwadi
	13.Koregaon	13.Sawantwadi
	14.Vadagaon Kasaba	14.Malwan
	15.Satararoad	15.Vengurla

Percentage of population engaged in tertiary activity		
Less than 50 %	50 % to 80 %	Above 80 %
	16. Malakapur	16.Madhavnagar
	17. Pophali	17.Gandhinagar
	18. Harnai	18. Khed
	19. Alore	19.Mahabaleshwar
	20. Panhala	20.Rajapur
		21.Panchagani
		22.Dapolicamp
		23.Dabhol.

The changes in the occupational characteristics since independence are due to two factors, first due to growth of population in a particular activity and second, due to changes in classification system adopted during verious census periods. It is observed that population size of urban centres and the share of secondary and tertiary sectors show high positive co-relation. When the size of urban centre increases, the proportion of population engaged in secondary and tertiary activity also shows increase . When the size of urban centre is small, it has large share of population engaged in primary activity. It is observed that the tertiary activity plays an

important role in the development of urban centres and encourages the economic growth of the region.

FUNCTIONAL CLASSIFICATION OF TOWNS :

The classification of urban centres on the basis of their size and morphology was given due importance by early geographers . But in the recent years towns are considered as the points of specialised activities. The activities performed by urban centres depend on the need of their tributary areas (Harris - 1945) . The towns are the products of centripitle and centrifugal forces.

The functional classification of cities has two approches, first statistical and second non-statistical. Most of the earliar classifications were based on qualitative approch. After world war II most of the classifications were based on statistical methods.

REVIEW OF METHODS OF CLASSIFICATION :

The most important qualitative method of urban classification was given by M.Aurousseau (1921). McKenzie (1925), a sociologist classified towns in to four general types. Gist and Halbert (1954) have added a class of diversified cities to the previous classifications. Wemier and Hoyt (1948) have introduced the definitions of functions of towns. They have classified towns into five classes. Hall (1934) classified cities of Japan into four types. In ancient India towns were

classified into six types. The quantitative approch to the functional classification has been widely used during the last thirty years. The best known methods of classification are put forward by Harris (1943), Pownall (1953), Nelson (1955), Garrison (1956), Alexanderson (1956), Webb (1959) and King (1961). In India Janaki (1954), Singh (1959), M.Mukerji (1970) and Lal (1959) have worked on the classification of Indian towns.

Table No.5.2

MEAN AND STANDARD DEVIATION FOR ACTIVITIES

1951	I Cu o	II Cu uo	III Cu L	IV N Cu	V Pr	VI Com	VII Tr	VII Os
(Mean)	16.46	3.46	4.58	3.18	21.19	15.62	4.26	30.80
(S.d.)	14.44	3.19	5.87	2.50	11.20	6.59	4.91	14.65
(mean+s.d.)	30.90	6.65	10.45	5.68	32.39	22.21	9.17	45.45
(mean+2 sd)	45.34	9.84	16.32	8.18	43.59	28.80	14.08	60.10
(mean + 3 sd)	59.78	13.03	22.19	10.68	54.79	35.39	18.99	74.75

Table No.5.2

MEAN AND STANDARD DAVIATION FOR ACTIVITIES

1961	I	II	III	IV	V	VI	VII	VIII	IX
	Cu	Ag.L.	L.F.mg	Hi	Mf	Con	Tc	TSC	OS
(mean)	21.44	7.81	5.32	7.04	11.34	3.23	12.74	5.55	24.43
(sd)	15.16	9.10	15.14	9.78	11.78	9.59	8.28	3.96	14.52
(mean + sd)	36.60	16.91	20.73	16.82	23.12	12.82	21.02	9.51	38.95
(mean + 2 sd)	51.76	26.01	36.14	26.60	34.90	22.41	29.30	13.47	54.47
(mean + 3 sd)	66.92	35.11	51.55	36.38	46.68	32.00	37.58	17.43	67.99

1971	I	II	III	IV	V	VI	VII	VIII	IX	X
	Cu	AgL.	Lf	Mg	Hi	Mf	Con	Tc	TSC	OS
(mean)	17.16	9.97	4.01	1.81	5.14	13.69	5.81	17.43	6.40	18.44
(sd)	13.01	16.37	7.63	8.25	5.18	13.53	11.55	10.53	4.60	11.32
(mean + sd)	30.17	26.34	11.64	10.06	10.32	27.22	17.36	27.96	11.00	29.76
(mean + 2 sd)	43.18	42.71	19.27	18.31	15.50	40.75	28.91	38.49	15.60	41.08
(mean + 3 sd)	56.19	59.08	26.90	26.56	20.68	54.28	40.46	49.02	20.20	52.40

1981	I	II	III	IV
	Cu	Ag L	Hi	OW
(mean)	13.60	9.96	5.05	72.99
(s.d.)	11.80	9.88	3.57	13.54
(mean+sd)	25.40	19.84	8.62	86.53
(mean+2sd)	37.20	29.72	12.19	100.07
(mean+3sd)	49.00	39.60	15.76	113.61

Cu = (Cultivators)
Ag L = (Agricultural Labourers)
Hi = (Household Industry)
OW = (Other Workers)
Lf = (Livestock, forestry)
Mq = (Mining and Quarrying)
Mf = (Manufacturing)
Con = (Construction)
Tc = (Trade and Commerce)
TSC = (Transport, Storage and Communication)
OS = (Other Services)
Tr = (Transport)
Com = (Commerce)
Pr = (Production other than cultivation)
N Cu = (Non Cultivating rent recivers)
Cu L = (Cultivating Lebourers)
Cu uo = (Cultivators of land un owned)
Cu O = (Cultivators of land owned)

CHOICE OF METHOD FOR CLASSIFICATION OF TOWNS :

In the present study Nelson's method of Service classification is used and the towns have been classified for the last four decades since independence. At the same time a comparative analysis has been attempted for the functional bases of classification.

Nelson has used arithmatic average of percentage of labour force engaged in various groups of occupational activities in towns of the study area. He has calculated the mean percentage of each function and its standard deviation value. Further he has given three classes of specialization. They are mean + standard deviation, mean + 2 Standard deviations and mean + 3 Standard deviations. By this method the towns can be classified and the specialisation can be measured. Using this method the functional classification of towns of the study area for 1951, 1961, 1971 and 1981 has been attempted. The table No.5.2 gives the details of mean, mean + standard deviation, mean + 2 standard deviations and mean + 3 standard deviations values for each category of occupation.

A special note of explanation is essential before we analyse the functional importance of various towns in the area. The bases of classification for the towns for 1951,1961, and 1971 data is similar. But for 1981 data the classification categories have become different. Considering the 1981 classification system the towns have been classified as

primary activity centres, secondary activity centres and tertiary activity centres. This scheme of classification is more rational when one looks into the data of workers found in the census. In view of this, all towns of the area are studied together for 1951, 1961 and 1971 periods. Only for 1981 a separate analysis is given.

FUNCTIONAL ANALYSIS OF TOWNS -

MANUFACTURING TOWNS :

In the year 1951 there were four manufacturing towns in the area, namely, Solapur, Barsi, Ichalkaranji and Satara - road. But in 1961 the group has increased to eight. The town Barsi was dropped from this group and four other towns, Madhavnagar, Jaysingpur, Vita and Sadashivgad have been added. The fig.No.5.6 shows the functional importance of manufacturing towns in the study area. It is essential to give a clarification that the towns which were included in the ' Production other than cultivation ' in 1951 census, are grouped in to ' manufacturing ' and ' household industry ' considering their status according to 1961 and 1971 census.

HOUSEHOLD INDUSTRY TOWNS :

In 1951 there were two towns, Maindargi and Vadagaon Kasaba, where the dominance of household industry was found. In 1961 also only these two towns were included in this category. In 1971 one more town, Mhaswad is classified as household industry town.(Fig.5.6).

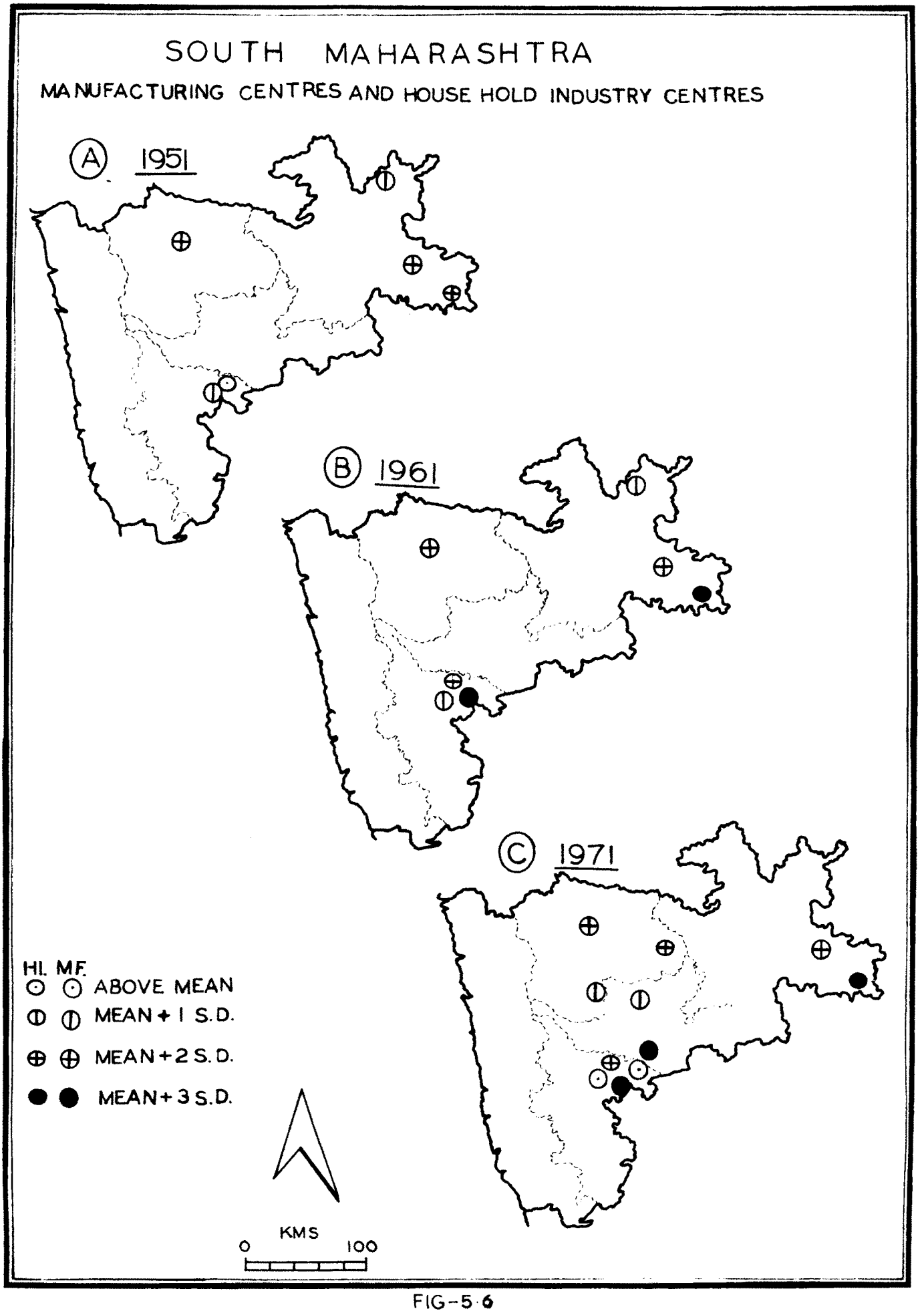
SOUTH MAHARASHTRA
MANUFACTURING CENTRES AND HOUSE HOLD INDUSTRY CENTRES
A 1951
B 1961
C 1971
HI. MF.
ABOVE MEAN
MEAN + 1 S.D.
MEAN + 2 S.D.
MEAN + 3 S.D.
KMS
0
100

FIG-5·6

TRANSPORT AND COMMUNICATION CENTRES:

In 1951 two towns, Kurduwadi and Nate were classified as transport and communication centres. In the next decade Nate was dropped from this category and another four towns namely Jaysingpur, Vengurla, Malwan and Dabhol were added as Tsc (Transport,Storage and communication) towns. In 1971 Jaysingpur and Vengurla have been dropped from this category and other two towns, Miraj and Pandharpur, have been included (Fig.No.5.7.)

TRADE CENTRES:

Eight towns, Sangli,Pandharpur, Chiplun, Jaysingpur, Karmala, Khed,Rajapur and Malakapur were classified as trade centres in 1951. In 1961 only three towns, Khed, Pandharpur and Gandhinagar have been classified as T.C. (Trade and Commerce) centres and in 1971 seven towns, Barsi, Karmala, Gandhinagar, Khed,Mahabaleshwar, Rajapur and Malakapur are included in this category of trade centres. (Fig.No.5.8)

RURAL SERVICE CENTRES:

This class of towns includes most of the rurban centres, where agriculture is a dominant activity. In 1951, fourteen towns namely Karad, Islampur, Tasgaon, Vita, Ashta,Gadhinglaj, Kurundwad, Mangalvedha, Kagal, Sangola, Mhaswad, Rahimatpur, Murgud and Dudhani were included in this class. In 1961 this group includes the following seventeen towns Miraj, Islampur,

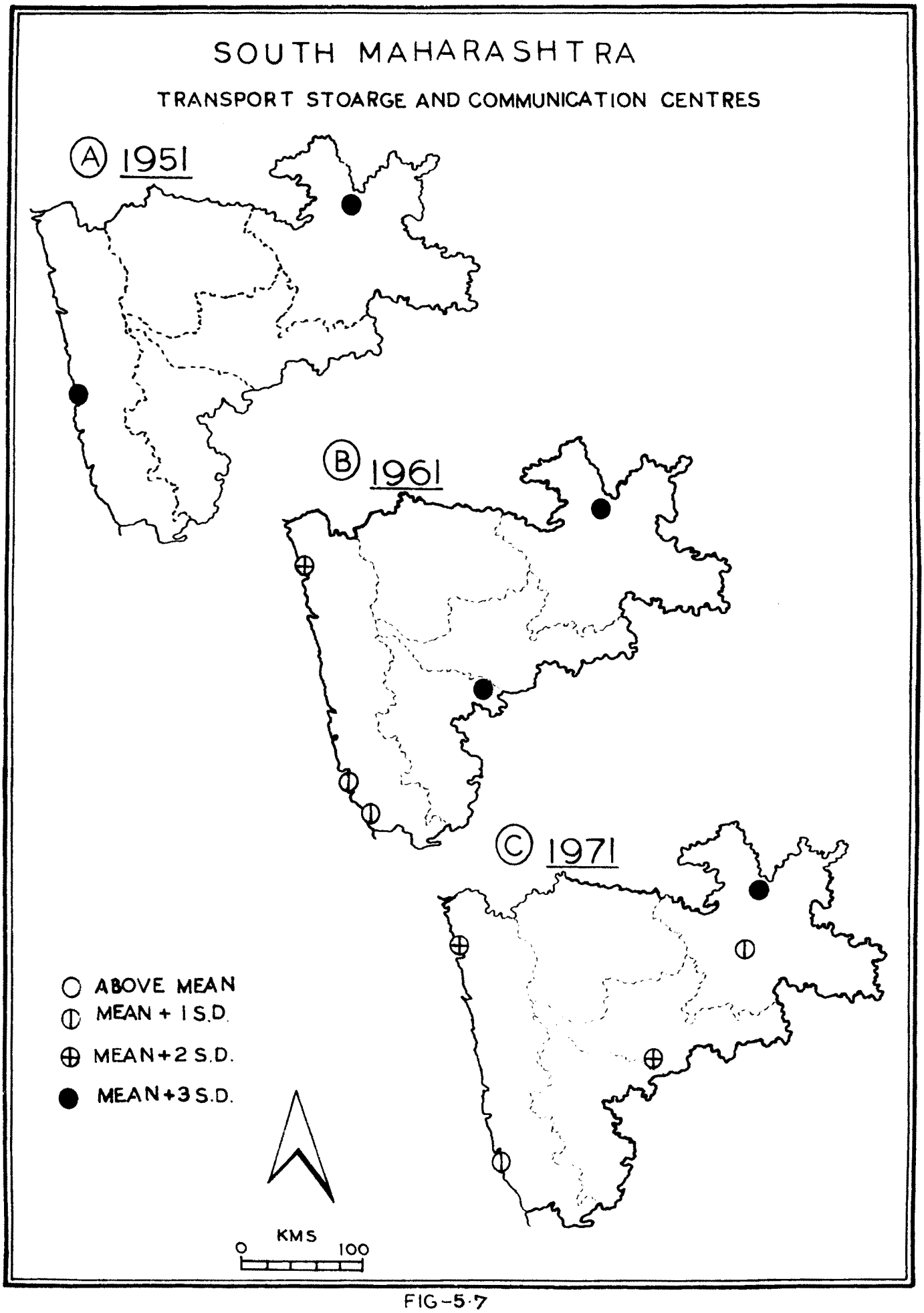
SOUTH MAHARASHTRA
TRANSPORT STOARGE AND COMMUNICATION CENTRES
A 1951
B 1961
C 1971
ABOVE MEAN
MEAN + 1 S.D.
MEAN+2 S.D.
MEAN+3 S.D.
KMS
0
100

FIG-5·7

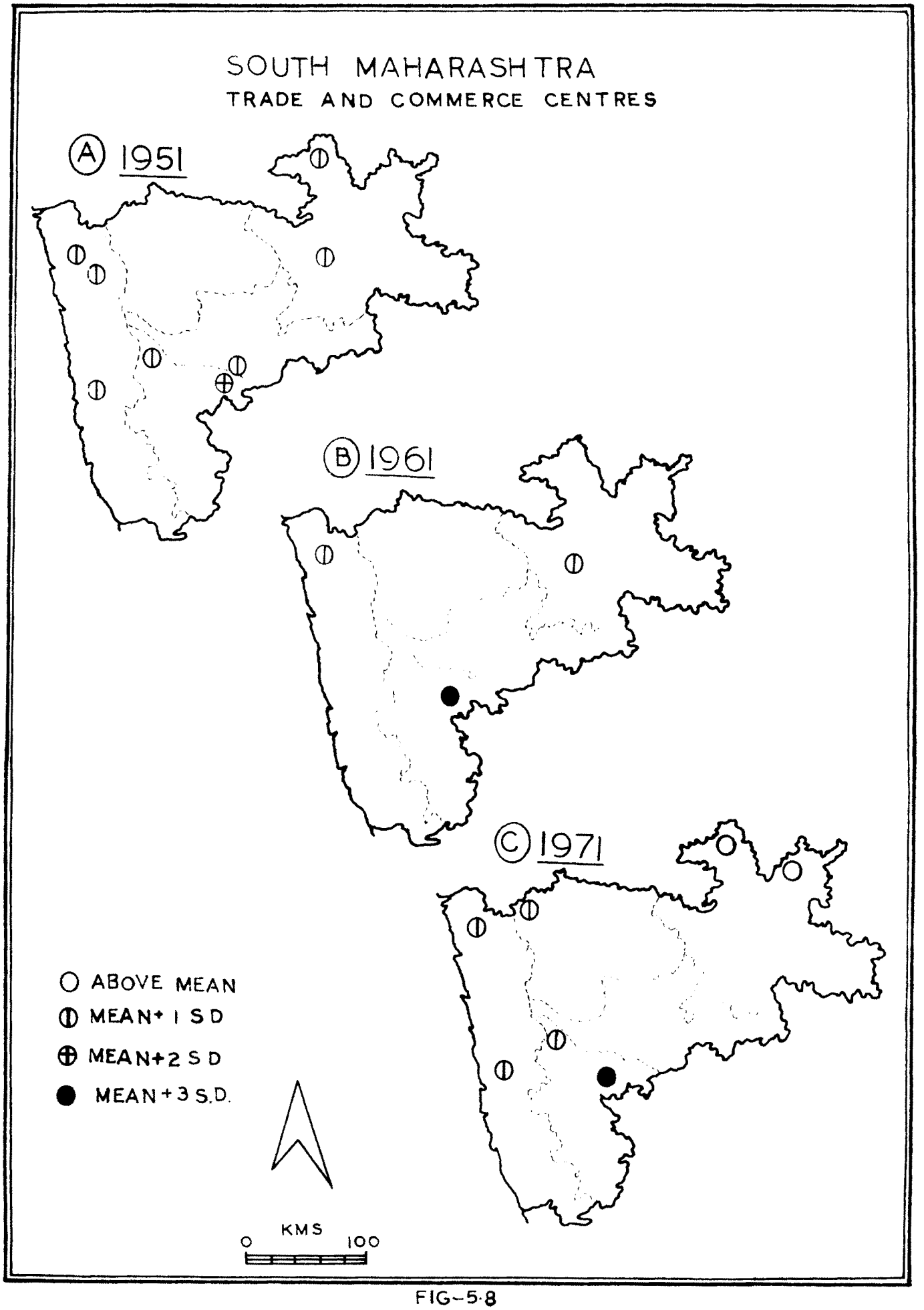
SOUTH MAHARASHTRA
TRADE AND COMMERCE CENTRES
A 1951
B 1961
C 1971
ABOVE MEAN
MEAN+ 1 S D
MEAN+2 S D
MEAN+3 S.D.
KMS
0
100

FIG-5·8

Akalkot,Tasgaon, Wai, Vita, Ashta, Gadhinglaj, Kurundwad, Mangalvedha, Kagal, Sangola, Mhaswad, Rajapur, Murgud, Dudhani and Nate. In 1971 this class includes fourteen towns. They are Islampur, Akalkot, Tasgaon, Ashta, Gadhinglaj, Kurundwad, Mangalvedha, Kagal, Rahimatpur, Murgud, Dudhani, Shirgaon ,Sangola and Bhade (Fig.No.5.9).

ADMINISTRATIVE CENTRES:

This class of towns includes most of the taluka head-quarters, district head quarters and the places where "other service" activity is dominant. In 1951 twelve towns namely Kolhapur, Miraj, Satara, Ratnagiri, Phaltan, Akalkot, Wai, Sawantwadi, Mahabaleshwar, Malwan, Vengurla and Panchgani were included in this class. In the next decade following 14 towns were included. They are Sangli, Satara, Karad,Ratnagiri, Phaltan, Chiplun, Sawantwadi, Karmala, Mahabaleshwar, Rajapur, Panchagani, Dapoli camp, Panhala, and Malakapur. All these towns have dominance of service activity. In 1971 following towns were included in this class. They are, Sangli, Satara, Karad, Ratnagiri, Vengurla, Patan, Chiplun, Wai, Panchagani, Sawantwadi, Dapolicamp, Alore ,Panhala and Phaltan.
(Fig. No.5.10)

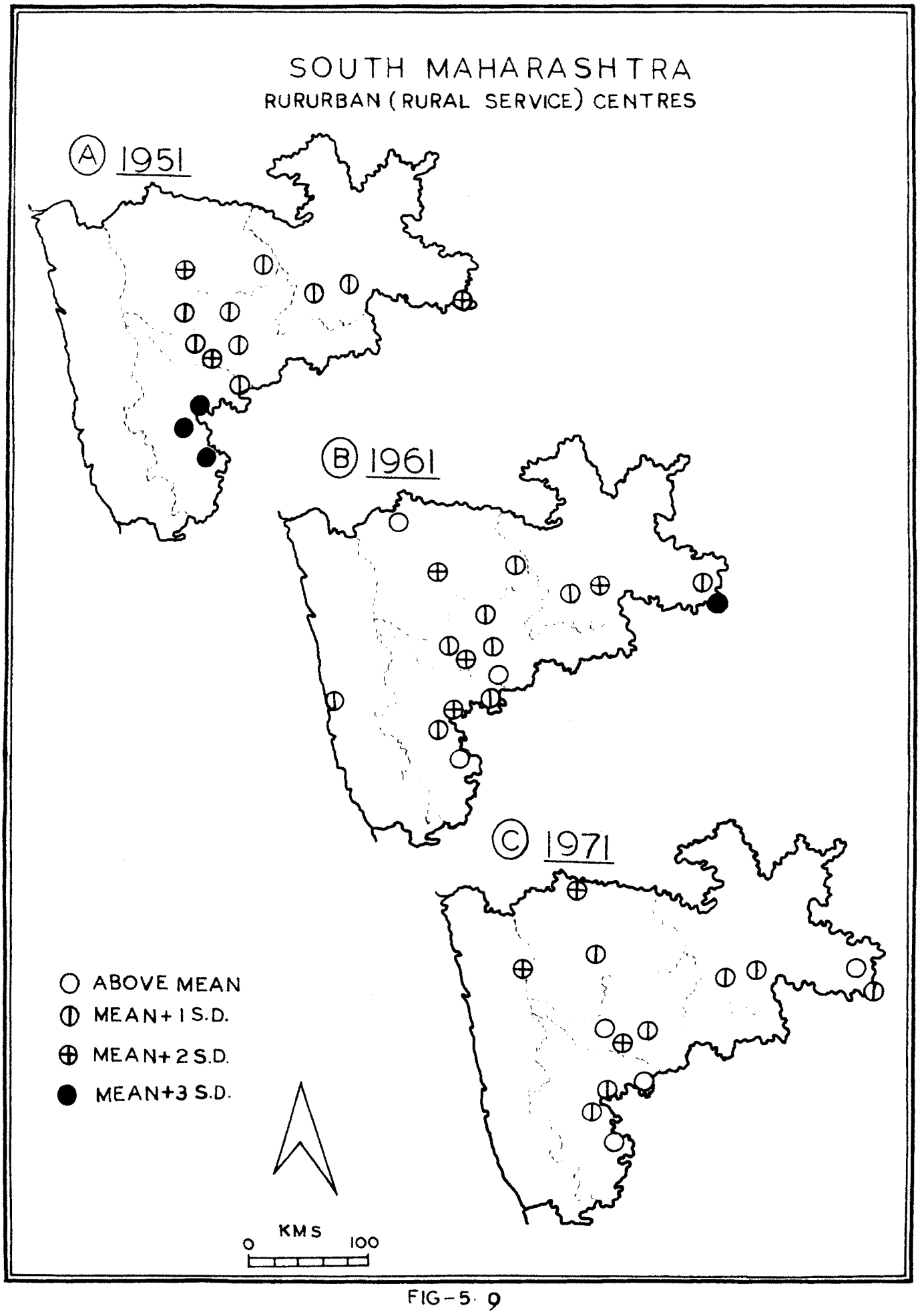
SOUTH MAHARASHTRA
RURURBAN (RURAL SERVICE) CENTRES
A 1951
B 1961
C 1971
ABOVE MEAN
MEAN+1 S.D.
MEAN+2 S.D.
MEAN+3 S.D.
KMS
0
100

FIG-5·9

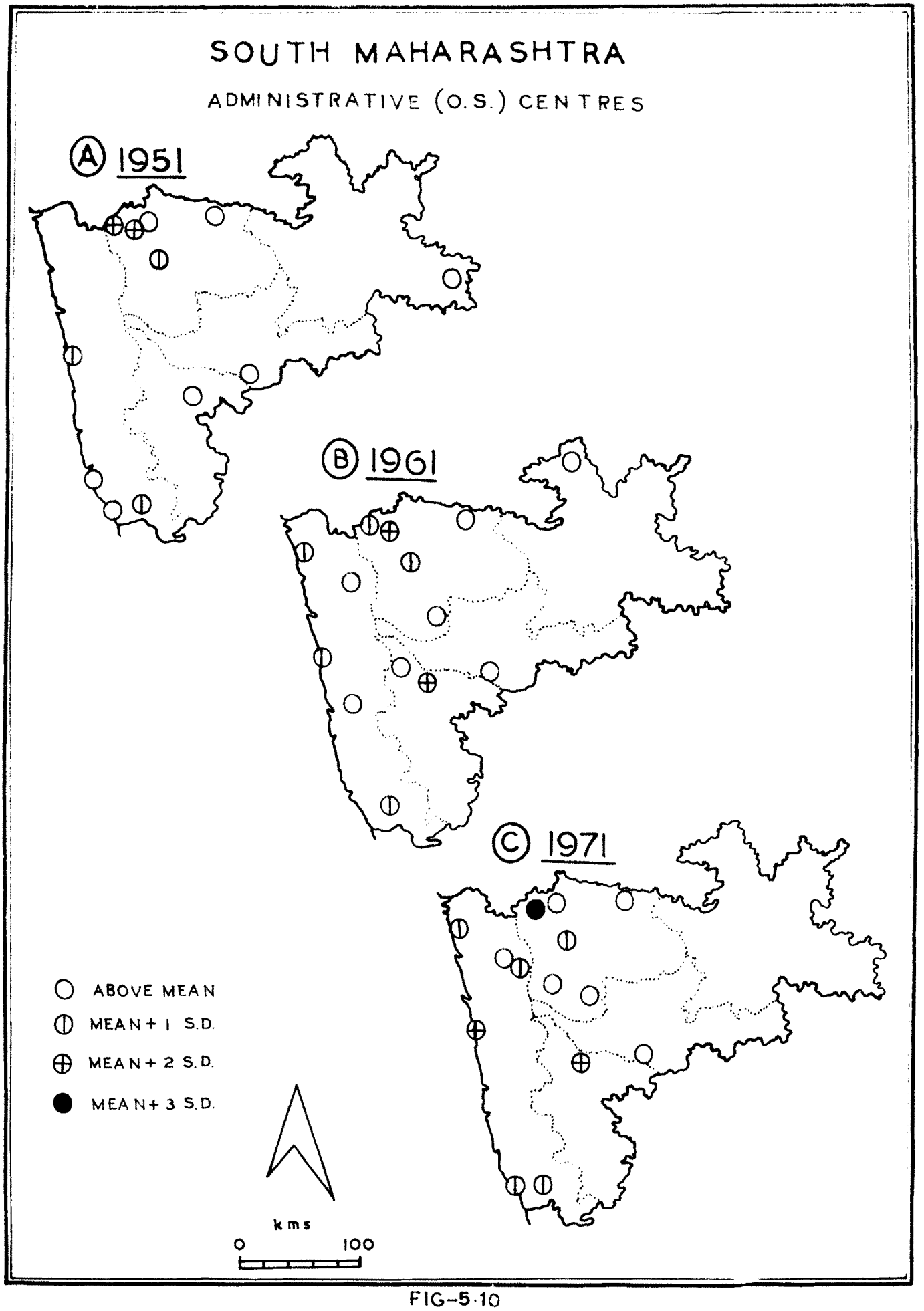
SOUTH MAHARASHTRA
ADMINISTRATIVE (O.S.) CENTRES
(A) 1951
(B) 1961
(C) 1971
ABOVE MEAN
MEAN + 1 S.D.
MEAN + 2 S.D.
MEAN + 3 S.D.
kms
0
100

FIG-5·10

CONSTRUCTION TOWNS :

After independence a few dam site towns have been developed. These towns were mainly engaged in construction activity. In 1951 not a single town was included in this class. But in 1961 one town, Pophali, was classified as construction town. In 1971 three towns, Pophali, Humbarli and Gokul T.Helwak, were classified as construction towns. When the construction job is over then such towns lose their function and decline. (Fig.No. 5.11)

MINING AND LIVESTOCK ACTIVITY CENTRES:

In the year 1951 no town has been classified under this class. But in 1961 two towns, Harnai and Redi, were classified as mining and livestock centres. Of these two towns Harnai is livestock centre and Radi is mining centre. In 1971 one more town, Nate, has been added to this class. Of these three towns Nate and Redi have been declassified according to 1981 census (Fig. No.5.11) The table No.5.3 indicates the changes in Functions of Towns in South Maharashtra.

FUNCTIONAL ANALYSIS OF TOWNS (1981):

As mentioned earlier the new classification of occupational data gives different classes of towns. Considering the problem of classification an attempt has been made here to classify towns in-to three basic groups of occupation. However in the present study the group of population which is classified as cultivators and agricultural labourers is considered to be

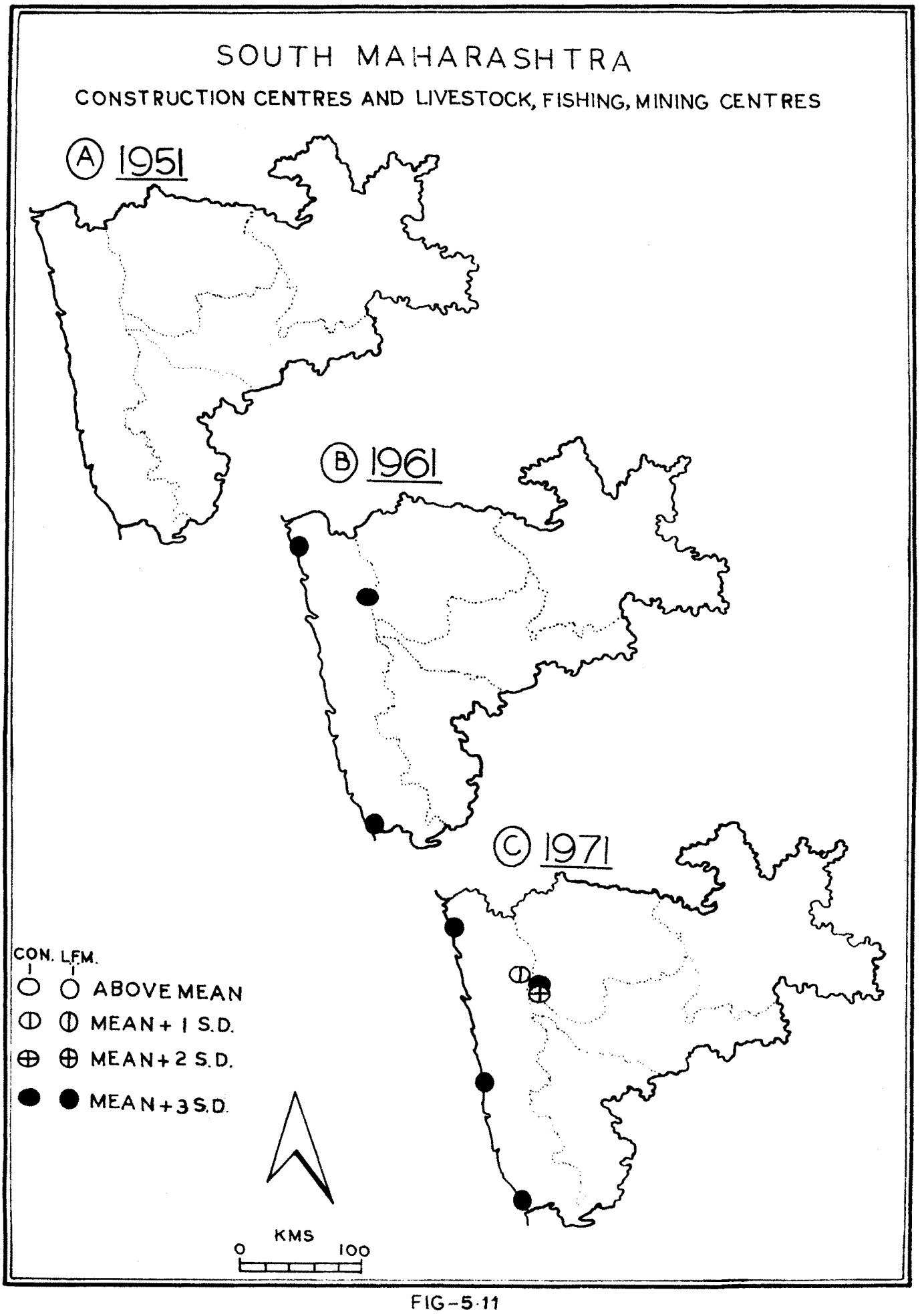
SOUTH MAHARASHTRA
CONSTRUCTION CENTRES AND LIVESTOCK, FISHING, MINING CENTRES
A 1951
B 1961
C 1971
CON. LFM.
ABOVE MEAN
MEAN + 1 S.D.
MEAN + 2 S.D.
MEAN + 3 S.D.
KMS
0
100

FIG-5·11

a primary activity and thus the towns where these activities are dominant, are classified as primary activity centres. While the places, where the 'household industry ' activity is significant, are classified as Secondary activity centres and the towns, where, population is dominantly engaged in ' Other Workers ' activity, are classified as tertiary activity centres. In this way all fifty three towns of the area are classified into three groups of functional activities.

PRIMARY ACTIVITY CENTRES:

Most of the towns dominated by agricultural activity and acting as small size central places are found in this class. Out of the fiftythree towns of the area, twenty towns are included in this class. They are Islampur, Tasgaon, Wai, Vita, Ashta, Gadhinglaj, Mangalvedha, Sangola, Rahimatpur, Mhaswad, Koregaon, Murgud, Pophali, Kankavli, Akalkot, Kirolskarwadi, Kurundwad, Kagal, Dudhani, and Harnai. Out of these twenty towns the last six towns have a dominance of ' agricultural ' activity. (Fig.No.5.12.)

SECONDARY ACTIVITY CENTRES:

As per the census data the secondary activity includes only population engaged in 'Household industry,'. This class includes four towns of the area namely, Vadagaon Kasaba, Maindargi, Malakapur and Panhala (Fig.No.5.13).

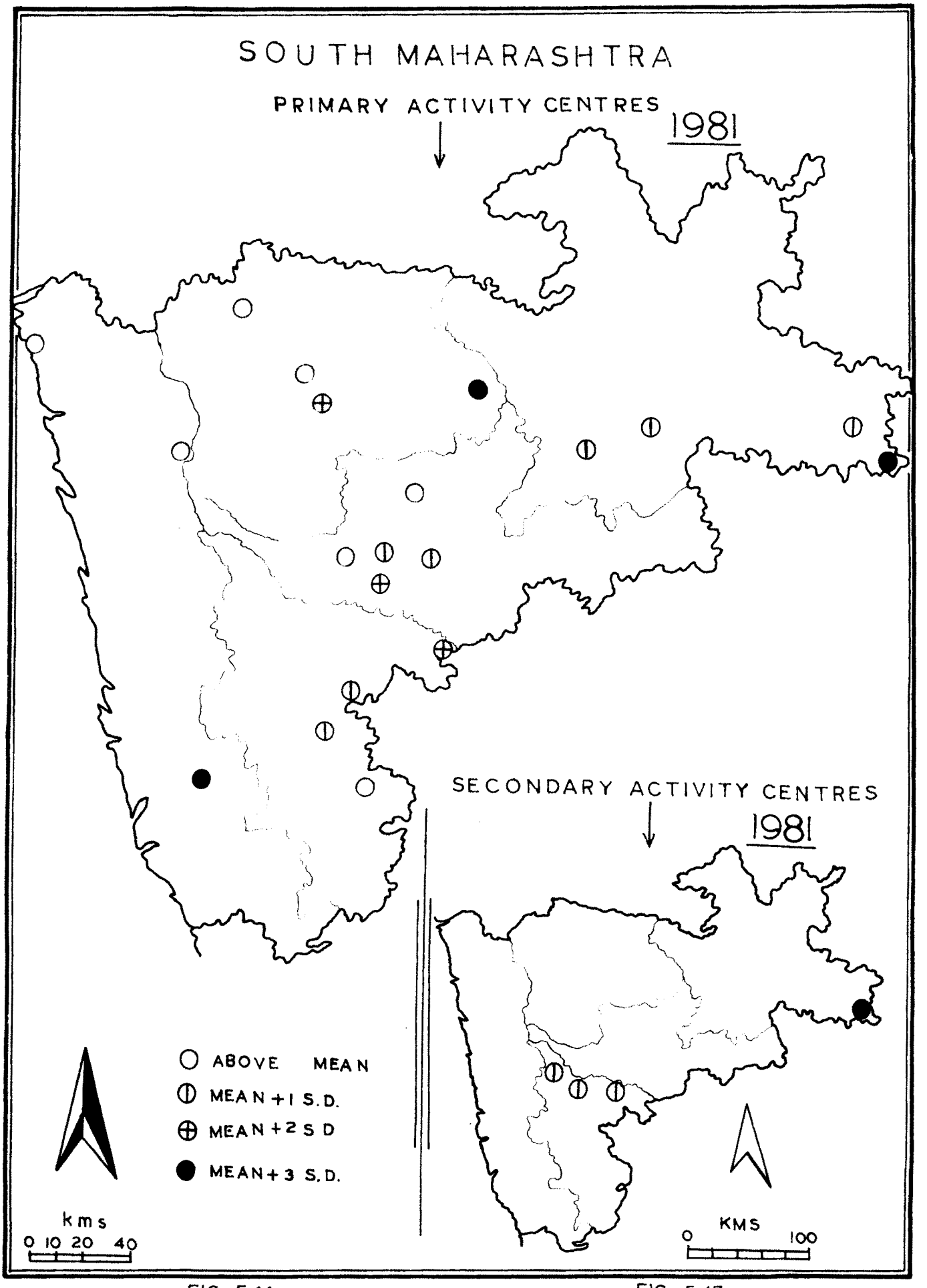

FIG-5·12

FIG-5·13

TERTIARY ACTIVITY CENTRES:

Very high percentage of urban centres is included in this class of towns. Out of the total towns, 29 twons are included in this group. Most of the large size towns of the area, where, the dominance of tertiary activity is found to be very high, are included in this group. They are Solapur, Kolhapur, Sangli, Ichalkaranji, Miraj, Satara, Barsi, Karad, Pandharpur, Ratnagiri, Phaltan, Chiplun, Jaysingpur, Kurduwadi, Sawantwadi, Kabnur, Malwan, Karmala, Vengurla, Madhavnagar, Satararoad, Gandhinagar,Khed, Mahabaleshwar, Panchagani, Rajapur, Dapolicamp, Dabhol and Alore (Fig.No.5.14).

The regional analysis of functional classification of towns and changes in occupational characteristics of towns for the first three decades since independence clearly indicates that the large size towns are dominated by manufacturing, other services and trade and commerce activities. While small size towns with rural base show the dominance of agricultural and other services activities. Very few small towns are dominated by manufacturing activity. The 1981 census includes several primary and secondary activities in to tertiary activity as such comparative analysis of the changes in occupational and functional character of towns is not possible.

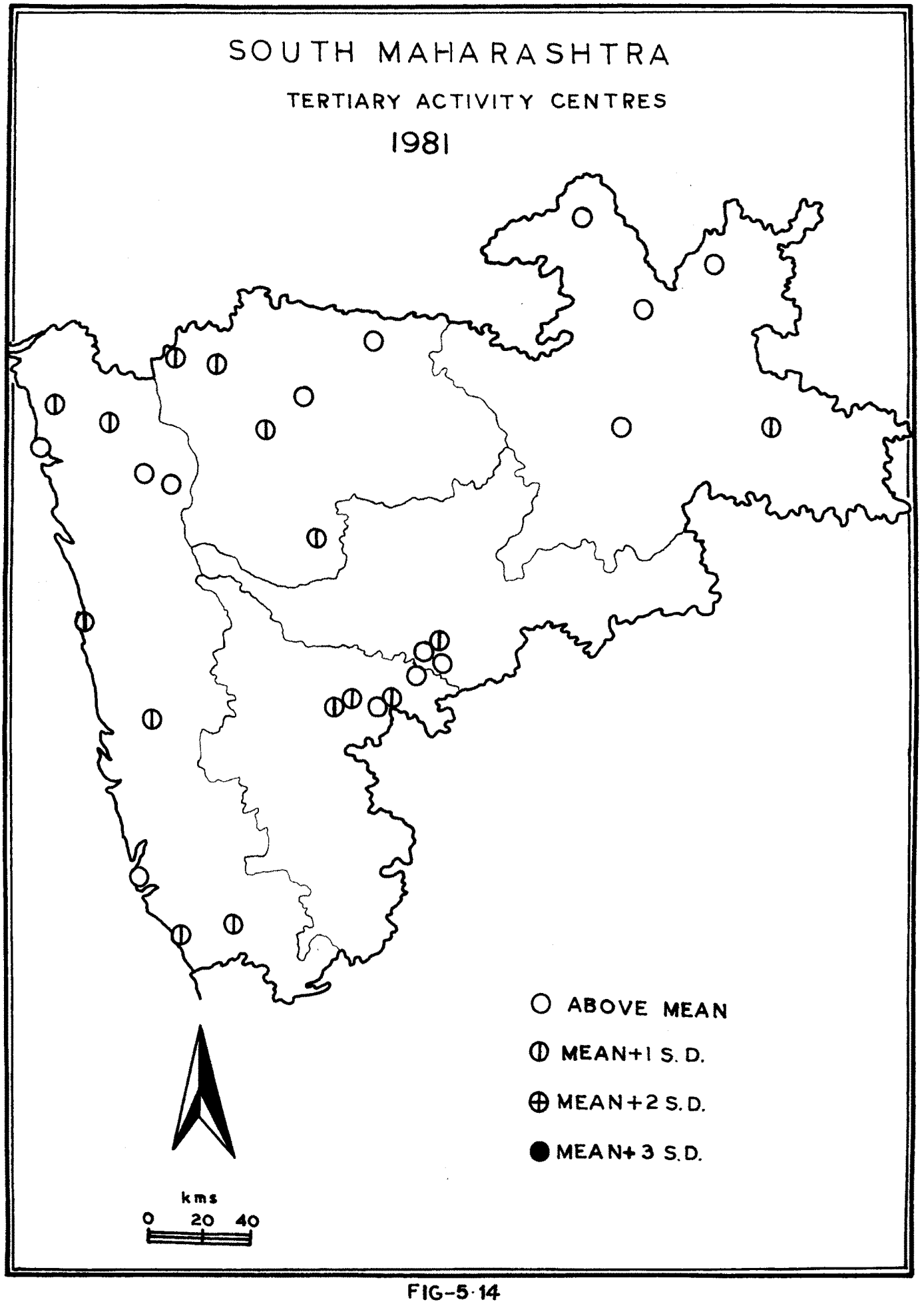
SOUTH MAHARASHTRA
TERTIARY ACTIVITY CENTRES
1981
ABOVE MEAN
MEAN+1 S.D.
MEAN+2 S.D.
MEAN+3 S.D.
kms
0 20 40

FIG-5·14

TABLE NO.5.3

Changes in Functions of Towns (1951,1961,1971).

	Function	Name of the Urban centre		
		1951	1961	1971
A]	Manufacturing Centres	1.Solapur	1) Solapur	1) Solapur
		2.Ichalkaranji	2) Kolhapur	2) Kolhapur
		3.Satara Road	3) Ichalkara-nji	3) Ichalkaran-ji
		4.Barsi	4) Satara Road	4) SataraRoad
			5) Barsi	5) Vita
				6) Jaysingpur
				7) Madhavnagar
				8) Sadashivgad.
B]	Household Industry Centres	1.Maindargi	1.Maindargi	1) Maindargi
		2.Vadagaon - Kasaba	2.Vadagaon- Kasaba	2) Vadagaon - Kasba
				3) Mhaswad
C]	Transport, Storage and communication centres.	1.Kurduwadi	1.Kurduwadi	1.Kurduwadi
		2.Nate	2.Jaysingpur	2.Miraj
		3.—	3.Malwan	3.Malwan
			4.Vengurla	4.Pandharpur
			5.Dabhol	5.Dabhol

Function	Name of the Urban Centre		
	1951	1961	1971
D] Trade and Commerce Centres.	1.Sangli	1.Pandharpur	1.Malakapur
	2.Pandharpur	2.Gandhinagar	2.Gandhingar
	3.Chiplun	3.Khed	3.Khed
	4.Jaysingpur	--	4.Barsi
	5.Karmala	--	5.Karmala
	6.Khed	--	6.Mahabalesh-war
	7.Rajapur	--	7.Rajapur
	8.Malakapur	--	--
E] Rural Service Centres (Ruurban Centres)	1. Karad	1.Miraj	1.Islampur
	2.Islampur	2.Islampur	2.Akalkot
	3.Tasgaon	3.Akalkot	3.Tasgaon
	4.Vita	4.Tasgaon	4.Ashta
	5.Ashta	5.Wai	5.Gadhinglaj
	6.Gadhinglaj	6.Vita	6.Kurundwad
	7.Kurundwad	7.Ashta	7.Mangalvedha
	8.Mangalwedha	8.Gadhinglaj	8.Kagal
	9.Kagal	9.Kurundwad	9.Sangola
	10.Sangola	10.Mangalvedha	10.Rahimatpur
	11.Mhaswad	11.Kagal	11.Murgud
	12.Rahimatpur	12.Sangola	12.Dudhani
	13.Murgud	13.Mhaswad	13.Shiregaon
	14.Dudhani	14.Rahimatpur	14.Bhade
	--	15.Murgud	--
	--	16.Dudhani	--
	--	17.Nate	--

Function	Name of the Urban Centre		
	1951	1961	1971
F] Administrative Centres (Other Services)	1.Kolhapur	1.Sangli	1.Sangli
	2.Miraj	2. Satara	2.Satara
	3.Satara	3. Karad	3.Karad
	4.Ratnagiri	4.Ratnagiri	4.Ratnagiri
	5.Phaltan	5.Phaltan	5.Phaltan
	6.Akalkot	6.Chiplun	6.Vengurla
	7.Wai	7.Sawantwadi	7.Chiplun
	8.Sawantwadi	8.Karmala	8.Wai
	9.Malwan	9.Mahabale-shwar	9.Sawantwadi
	10.Vengurla	10.Rajapur	10.Panchagani
	11.Mahabale-shwar	11.Panchagani	11.Alore
	12.Panchagani	12.Dapolicamp	12.Dapolicamp
	--	13.Malakapur	13.Patan
	--	14.Panhala	14.Panhala
	--		
G] Construction Centres	--	1.Pophali	1.Pophali
	--	--	2.Humbarli
	--	--	3.G.T.Helwak.

	Function	Name of the Urban Centre		
		1951	1961	1971
H]	Mining/ Quarrying/ Livestock/ Forestry/ Fishing Centres.	--	1.Harnai	1.Harnai
		--	2.Redi	2.Nate
		-	--	3.Redi

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CONCLUSION

In the second half of the 20th Century one is constantly reminded that everything affects everything else. A Systematic study of urbanization is given due importance since last 30 years. In India, attempts have been made to study selected cities in view of under-standing the problems of rapid urbanization, but there are very few attempts to study the process and trends of urbanization in India.

Towns, being the focal points of economic, cultural, administrative and other activities of society play a leading part in social and economic progress. Urbanization is an important indicator of the development of a country. The study of objective tendency of the growth of towns is an essential element of a scientific motivation for regional planning.

The growth of urban settlements is influnced by their Physical setting, historical evolution and their socio-economic linkage with the region. Considering the evolutionary account of towns of south Maharashtra , it is observed that, most of the ancient towns were developed as administrative centres, religious centres or defence centres. During the medieval period several towns have develcped as trade centres, transport centres, administrative centres and cultural centres. During the Biritsh period many towns have develcped as defence centres, industrial centres, transport centres and trade centres.

In the study region, most of the industrial towns have developed during the pre-independence and post-independence period. Many small industrial towns, market towns and dam-site towns were developed during post-independence period.

Urbanization is a phenomenon which develops urban character in the settlements in process of time. The systems of urban settlements are continuously under the process of evolution. Various social, political and economic conditions during the various historical times have played a great role in the growth and development of settlements in the study area.

The trend of growth of urbanization indicates that the process of urbanization is influnced by various factors in which the development of economy, agriculture, industry and transportation play an important role. Other two factors which offect the process of urbanization are rural urban migration and emergence of new towns. Since independence, the process of urbanization has become faster and higher degree of urbanization is found in the plain and fertile area of upper Krishna basin. In the Konkan region few towns are growing faster but many towns are declining because of poor infrastructure. Most of the rapidly growing towns are located in the lower part of upper Krishna basin. In future, Northern most part of Ratnagiri district will certainly stimulate the growth of towns and encourage the development of new towns.

The distributional characteristics of urban settlements in the study area clearly indicate that, apart from relief and

surface configuration, other factors like agricultural development, population density, transport net-work, resource localization and over-all economic development play an important role in the distribution of urban settlements. In the study region widely spaced and small size settlements are found in the areas having poor level of development and low density of population. In better developed areas urban centres are closely spaced and their size is relatively large.

A comparative analysis of occupational structure based on census data possess several difficulties because of the changes in the classification of workers incorporated by census from time to time. The regional analysis of functional classification of towns and changes in occupational characteristics of towns since independence can be attempted for 1951, 1961 and 1971 data ; and it clearly indicates that, the large size towns are dominated by manufacturing, other services and trade and commerce activities. The small size towns with rural base show the dominance of agricultural and other services activities. Very few small towns are dominated by manufacturing activity. The 1981 census includes several primary and secondary activities into tertiary activity. Hence, we have faced a great difficulty in the comparative analysis of the changes in occupational and functional character of towns. The regional analysis of functional characteristics of towns show considerable changes since independence.

The region under study is a developing part of

Maharashtra where, agricultural economy, development of irrigation and transport net-work have developed an infrastructure for the future growth of urbanization. Following the direction of modern trends, however, one may conclude that, in future the region will add few more new towns as well as increase the size of existing towns.

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