NATIONAL COMMISSION ON AGRICULTURE
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RAINFALL AND CROPPING PATTERNS

Volume IV

GUJARAT

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND IRRIGATION
NEW DELHI

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RAINFALL AND CROPPING PATTERNS—STATE SERIES

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RAINFALL AND CROPPING PATTERNS

GUJARAT

INTRODUCTION

1.1 The human population of the country is estimated to rise from the 1971 Census figure of 548 million to 935 million in 2000 AD. This rise calls for increased production. Land resources being limited emphasis has to be placed on increasing productivity per unit area. Temperature and other climatic conditions being favourable for crop production throughout the year over most parts of the country, it is possible to grow more than one crop in a year provided water, the most important input,, is available. In some parts of the country, the rainy season is long enough to provide scope for double cropping. This potential is yet to be fully exploited. There is scope for increasing irrigation resources in the country, but our estimates show that the area under irrigation is not expected to be more than 42 per cent of the total cropped area even in 2000 AD as against 22 per cent in 1970-71. Therefore, judicious utilisation of direct rainfall and irrigation water, singly and in combination, will have to be thought of for increasing production.

1.2 Farming technology has so advanced that it is possible to increase crop yields even under rainfed conditions, but the choice of crops would have to depend upon the amount and distribution of the prevailing rainfall. Additionally, it will be necessary that the maximum possible quantity of rain water is conserved in ponds and pools situated either within the farm area or elsewhere, in soil profiles and underground storages so that the same could be readily used to save crops in times of water stress. Not only in rainfed farming but even under irrigated conditions, one will have to plan for the most economic and efficient use of water so as to derive maximum possible benefit from rainfall and reduce dependence on irrigation. This necessitates a close study of the existing cropping patterns vis-a-vis rainfall patterns aimed at determining the nature of changes needed in the former. The cropping patterns depend primarily on the soil and climatic factors but the evolution of a cropping pattern in course of time is the combined effect of soil, climate, food habits and requirements and economic factors. In the context of increasing production, it is necessary to examine the cropping patterns from a scientific angle and find out possible alternative patterns having higher potential. Accordingly, the Commission undertook a comprehensive study of the rainfall and cropping patterns of the country using taluk or tehsil as unit of area. It covered several other relevant factors such as orography, land use data, human and livestock populations,, soil and climate, the object being to make, as far as possible, an integrated assessment.

1.3 Chapter 14 on Rainfall and Cropping Patterns of the Commission's Report presents a consolidated account of the data collected together with analysis of their inter-relationships on all-India basis. In this analysis the Commission has been greatly benefited by the discussions with the concerned officers of State Governments. It was realised that by condensing the vast amount of information collected from each State into the small space of a chapter, many important and peculiar features of individual States were likely to be missed and hence the data and analysis of each State have been presented in separate volumes. The manner of presentation is similar to Chapter 14. It has also been considered desirable to include in each State volume the methodology and suggestions for future cropping patterns, which are practically the same as given in Chapter 14.

2 METHODOLOGY

2.1 The chief features of the study are (a) use of taluk or teshil as unit of area for all basic data and analysis, (b) introduction of coded numerical forms to express patterns of distribution of monthly rainfall throughout the year,, crops and livestock; (c) inclusion of information on orography, temperature, evapotranspiration, rainfall, soil, irrigation, land use, human and livestock populations and yield performance of crops, all of which influence in different ways and degrees the cropping patterns of a place and (d) presentation of coded information on rainfall, crops and livestock on 1 : 1 million scale maps.

Rainfall Patterns

2.2 A major feature of Indian rainfall is that the southwest monsoon season (June to September) accounts for 70 to 95 per cent of the annual rainfall throughout the country except in the south east peninsula and Kashmir and adjoining hill areas. The monsoon as well as the annual rainfall show large fluctuations from year to year but, as stated in Chapter 13 on Climate and Agriculture, there is no significant evidence of any trend or periodicity in either of them. Considered in relation to crop production, the total

annual or seasonal rainfall does not have much significance and what is important is its distribution during the period of growth of different crops. A relevant question, therefore, is whether rainfall should be examined on a weekly, fortnightly or monthly basis. The coefficient of variation (CV) of monthly rainfall is as high as 40-50 per cent even in the rainiest month of July over most of the central, northern and eastern India. In the south excluding the west coast, CV is higher and varies from 60 to 100 per cent. The variability of weekly or fortnightly rainfall being still greater, makes the use of either of them undependable as indicators of rainfall distribution. For a macro-study like the present, monthly rainfall data which are more dependable and also the most convenient to handle have been used.

2.3 In order to relate crop production with rainfall, certain norms have to be assumed depending on the duration of the crops and their water requirements. On the basis of available information and the fact that most crops mature in about 90 days, the following broad norms have been drawn up :

(i) Rainfall greater than 30 cm per month (cm pm) for at least three consecutive months would be suitable for a crop like paddy whose water need is very high.

(ii) 20-30 cm pm for not less than three consecutive months would be suitable for crops whose water need is high but less than that of paddy for example, maize and black gram.

(iii) 10-20 cm pm for at least three consecutive months would be suitable for crops requiring much less water, e.g., bajra and small millets.

(iv) 5-10 cm pm for three consecutive months would be just sufficient for crops which have low water requirements, e.g., *month* (*P. aconitifolius*) and ephemeral grasses.

(v) Rainfall less than 5 cm pm for three consecutive months is not of much significance for crop production.

2.4 For denoting the year's rainfall distribution using monthly totals, a convenient code in letter symbols with numerical subscripts explained below, has been evolved. The letters A to E in Table 1 indicate the ranges of monthly rainfall and the subscripts to these refer to the number of months having these ranges of rainfall e.g. A indicates two months with rainfall greater than 30 cm pm. The ranges correspond to those stated in the preceding paragraph.

TABLE 1

Code for Rainfall Data

Symbol	Monthly rainfall cm pm
A†	Greater than 30
B	20—30
C	10—20
D*	5—10
E*	Less than 5

†An examination of monthly rainfall in the country shows that except for areas in the west coast and some hill stations in extreme north-east, normal monthly rainfall seldom exceeds 40 cm.

*In distributions containing ranges of rainfall covered by A or B termed briefly as A & B types amounts less than 10 cm are not so significant and their frequency is generally small. To reduce the number of combinations, D is omitted in A or B type distributions; instead E is used to denote less than 10 cm pm. Thus $B_2 E_2$ would denote two months of 20-30 cm pm and two months less than 10 cm pm rainfall.

The southwest monsoon months of June to September being the principal rainy season dominate the rainfall distributions of the country. To indicate the season's importance, monthly rainfall distribution during June to September is shown in brackets in the annual pattern. To the right of the bracket is the distribution for the post-monsoon months, namely, October to January and to the left that for the pre-monsoon months namely, February to May. In order to explain how such a coded rainfall distribution written in symbols with numerical subscripts has to be interpreted, a hypothetical example may be considered $D_1 E_3$ $(A_2 B_1 C_1)$ $C_1 D_2$, in which for each of the three periods, the symbols are in order of decreasing rainfall which is not necessarily the calendar sequence can be explained as under :

(i) $D_1 E_3$ represents the period February to May in which one month's rainfall (usually May) is in the range of 5-10 cm and the remaining three months get less than 5 cm pm.

(ii) $A_2 B_1 C_1$ represents the period June to September, in which two months (usually July and August) get more than 30 cm pm rainfall, one month (September) gets 20-30 cm and the remaining months, i.e. June gets 10-20 cm.

(iii) $C_1 D_3$ represents the period October to January in which October gets 10-20 cm rainfall and the rest 5-10 cm pm.

Boundaries of Rainfall Zones

2.5 Since differences in monthly, seasonal and annual rainfall are not large within short distances, linear interpolation of rainfall data is permissible. Rainfall data being point measurements, isolines for the same or nearly the same type of distribution of monthly rainfall can, therefore, be drawn. These isolines may not necessarily follow the boundaries of taluks which

are taken to be unit of area in this study and hence for delineation of boundaries the following procedures has been adopted :

(i) Where variations are small, isolines follow the taluk boundaries;

(ii) where variations are large, isolines delineate the zone boundaries; and

(iii) any taluk, more than three quarters of which lies outside of zone is not considered a part of that zone.

2.6 If an identical distributoin is observed over two or more adjacent taluks a pattern is said to have evolved and the area covered by it is distinguished as a zone and indicated suitably by a Roman numeral. Rainfall patterns have been identified for the whole country using the methodology described above. The data used for the analysis are the monthly normals of rainfall (1901 to 1950)[1] and the patterns and zones are depicted on all-India map which forms part of Chapter 14 on Ranifall and Cropping Patterns of the Commission's Report.

Cropping Patterns

2.7 The basic data for the study of cropping patterns of the country are the areas under different crops in each of the taluks. A large number of crops are grown in a taluk but most of them occupy small areas, often less than one per cent of the total cropped areas of the taluk. With a view to limiting the number of crops constituting a pattern only those crops are considered which individually occupy 10 per cent or more of the gross cropped area of the taluk. In this process, several crops have to be excluded, even though they may be otherwise important. The minimum limit has been fixed at 70 per cent, so that the number of crops, which together cover at least 70 per cent of the gross cropped area, and in which none occupies less than 10 per cent, is not large. Trial computations have shown that in such distributions any crop occupying more than 10 per cent area is rarely omitted and the number of crops hardly exceeds five. When the same distribution holds good for two or more adjacent taluks, a pattern is obtained.

2.8 As in the case of rainfall, percentage area coverage by crops is expressed by means of numerical subscripts affixed to crop symbols shown in Table 2. The list of crops given below is comprehensive and will hold good for all the States.

TABLE 2

Crop Symbols and Area Intervals

	Crop	Symbol
1	rice	Pd
2	wheat	W
3	jowar (kharif)	Jk
4	jowar (rabi)	Jr
5	bajra	B
6	maize	M
7	ragi	R
8	small millets	Mt
9	barley	Ba
10	oats	Oa
11	gram .	G
12	pigeonpea (tur)	T
13	pulses other than pigeonpea and gram	Pu
14	groundnut	Gn
15	oilseeds other than groundnut	O
16	cotton	C
17	jute	u
18	other fibres	Fb
19	sugarcane	S
20	potato	Pt
21	vegetables	V
22	fruits	Fr
23	tapioca	Ta
24	plantations	L
25	fodder	F
26	chillies	Ch
27	tobacco	To

Area Interval (per cent)	*Subscript*
70 or more.	1
50—70	2
30—50	3
10—30	4
less than 10	5

The crop code contains the crop symbol and the appropriate subscript. In writing crop distribution, the first crop has always the highest area but the rest may not necessarily follow the order of decreasing areas. For example, crop distribution, C_3 Jr_4 Mt_4, means that cotton area is 30-50 per cent, and jowar rabi and millets each occupies 10-30 per cent of the gross cropped area, the total being 70 per cent or more. Two or more taluks having the same distribution of crops constitute a pattern. Cropping patterns so derived have been indicated on maps of 1:1 million size.

Relative Yield Index of Crops

2.9 Besides the absolute figures, the yield of a crop has also been expressed as per cent of all-India average which is called Relative Yield Index (RYI). Relative Yield Index values have been computed for the principal crops on the basis of (1968-69 to 1970-71) data available in the records of the Directorate of Economics and Statistics, Ministry of Agriculture and Irrigation.

Livestock Patterns

2.10 The livestock patterns are relevant only insofar as these are related to production of fodder and feeds. As talukwise data were not available for the livestock Census, 1972, those of 1966 Census as published by the States have been used. The animals considered for livestock analysis are shown in Table 3 together with their symbols.

1 Memoirs of India Meteorological Department, Volume**XXI**, Part 3, 1962.

TABLE 3

Livestock Symbols

Category	Symbol
cattle :	
male (over 3 years)	Cm
female (over 3 years)	Cf
young stock (under 3 years)	Cy
buffaloes :	
male (over 3 years)	Bm
female (over 3 years)	Bf
young stock (under 3 years)	By
sheep	S
goats	G
horses, mules and ponies	H
donkeys	D
camels	Ca
pigs	P

The livestock patterns are expressed in coded form in the same manner as the cropping patterns.

Soils

2.11 Soil data on a taluk basis are not available for all the area of the counrty. As such, soils have been discussed in a general manner using the traditional nomenclature in describing their characteristics.

Other Data

2.12 The sources of other data featuring in the study are given below :

item	*source*
taluk area	States' Census Reports 1971 or from the data furnished by the States in their land-use returns.
orography	maps of the Survey of India and National Atlas Organisation.
temperature	Climatological Tables of Observatories in India, India Meteorological Department, 1931—1960 normals.
evapotranspiration	scientific Report No. 136 of the India Meteorological Department, 1971.
human population	Census of India, 1971.
irrigation and land use statistics	basic data pertaining to land utilisation statistics obtained from the States and refer mostly to 1969-70.

Presentation of Information

2.13 The tables required for following the text are given in the text itself at appropriate places, whereas the basic data are appended as follows :

APPENDIX 1	Talukwise Land Use (1968-69 and population Statistics,) (arranged according to State rainfall zones).
APPENDIX 2	Talukwise Livestock Population—1966 (arranged according to State rainfall zones).
APPENDIX 3	Zonewise information on Rainfall, Rainy days and Cropping Patterns.
APPENDIX 4	Zonewise area under Principal Crops—1968-69.

2.14 Rainfall, cropping and livestock patterns of each State are indicated on maps in the 1 : 1 million scale and given in Appendices 5, 6 and 7 respectively. In the case of rainfall patterns, the zonal numbers in State maps have been given in Roman numerals and their all-India equivalents as used in Chapter 14 of the Commission's Report have been shown in three digit Arabic numerals within brackets.

3 GENERAL FEATURES

3.1 The area of Gujarat State is 1.96 lakh sq km spread over 19 districts. The smaller districts of Gandhinagar and Dangs have areas of 649 sq km and 1683 sq km respectively. Kutch district has the largest area of 45,612 sq km which is 23 per cent of the total area of the State. Areawise distribution of the districts is given below :

Area (sq km)	1—1000	1001-2000	2001-4000	4001-6000	6001-8000	8001-10,000
no. of districts	1	1	—	1	5	4

area (sq km)	10,001-12,000	12,001-14,000	14,001-16,000	Above 16,000
no. of distficts	4	1	1	1

The State has 184 taluks. Average area of a taluk is 1,065 sq km.

Elevation

3.2 Rann of Kutch is a low lying area. In the rest of the districts, the heights range between sea-level and 100 masl (metres above sea-level) excepting a small patch of area in Bhuj and Nakhatrana, where the maximum heights are 300 to 400 masl. The central region is between 100 to 300 masl high except for a few isolated peaks in Junagadh where the maximum elevation is 1,117 masl followed by Bhanvad with 637 masl. Bhesan 600 masl and Palitana 500 masl. In the rest of the area, the heights vary between sea-level and 200 masl. In Gujarat region the eastern boundary has a general maximum elevation of 300 to 400 masl. In Dangs, elevations range between 300 and 1.053 masl and in Bansa-Bharampur area the maximum elevation is 680 masl. Palanpur in Banaskantha has a maximum elevation of 1,090 masl.

Population

3.3 The total population of Gujarat State is 26.7 million and the average population density 136 per sq. km. Seventy-two per cent of the population is rural. The population density in districts ranges from 19 in Kutch to 341 in Kheda. Three districts of Gandhinagar, Ahmedabad and Kheda have a population density of more than 300. The number of taluks in different ranges of population in each of the districts is given in Table 4. Ahmedabad, a city taluk, has the highest population density of 6,289 per sq. km. followed by Chorasi (Surat) with a density of 1,108 and Vadodara of 993.

TABLE 4

Talukas in different Ranges of Population Density

District	Average density	Number of taluks	No. of Taluks with population density (per sq km) of					
			50	51-100	101-150	151-200	201-300	300
Saurashtra								
Jamnagar	79	10	—	7	2	—	1	—
Rajkot	145	13	—	7	2	2	1	1
Surendranagar	81	9	—	7	1	—	1	—
Bhavnagar	126	12	—	1	8	2	1	—
Amreli	126	10	—	3	5	1	1	—
Junagadh	156	15	—	2	5	5	3	—
Kutch	19	9	6	2	1	—	—	—
Gujarat								
Banaskantha	100	11	1	4	4	2	—	—
Sabarkantha	161	10	—	1	3	5	1	—
Mehsana	232	11	—	1	1	1	3	5
Gandhinagar	309	1	—	—	—	—	—	1
Ahmedabad	334	7	—	1	3	—	2	1
Kheda	341	10	—	—	—	1	4	5
Panchmahals	209	11	—	—	1	6	4	—
Vadodara	254	12	—	—	2	6	2	2
Bharuch	123	11	—	2	6	1	1	1
Surat	231	13	—	—	2	5	4	2
Valsad	273	8	—	—	1	—	1	6
Dangs	56	1	—	1	—	—	—	—
STATE	136	184	7	39	47	37	30	24
Saurashtra region		69	—	27	23	10	8	1
Kutch region		9	6	2	1	—	—	—
Gujarat region		106	1	10	23	27	22	23

Land Use

3.4 Districtwise land use statistics is given in Table 5. The area under forests is about 9 per cent of the geographical area of the State. Dangs district has the highest area of 70 per cent under forests followed by Panchmahals, Valsad, Surat, and Broach with 20 to 26 per cent, Junagadh with 18 and Banaskantha with 11 per cent. Elsewhere in the State, forest area is negligible. Nearly 73 per cent of the geographical area of Kutch district, 15-20 per cent of Surendranagar and Jamnagar districts, 10-15 per cent each in Sabarkantha Rajkot and Ahmedabad comes under barren and uncultivable land. Elsewhere such area is negligible. Fallow lands are generally negligible. Permanent pastures and other grazing lands cover 5 to 10 per cent area in Saurashtra. Kutch has the lowest net sown area of 10 per cent and Dangs comes next with 20 per cent but in the remaining parts of the State net sown area exceeds 50 per cent. In six of the districts net sown area is about 70 per cent or more of the total reporting area. Area sown more than once in this State is 6 per cent only of net sown area (1969-70).

TABLE 5

Districtwise Land Use Statistics—1969-70

(Percentage of reporting area)

District	Forest	Barren & uncultivable waste	Area under non-agri-cultural uses	Cultiva-ble waste	Permanent pastures & other grazing land	Land under misc. trees crops and groves	Current fallows	Other fallow	Net sown area
Dangs	69·7	3·6	1·6	1·0	0·2	—	3·4	0·8	19·7
Valsad	25·6	4·9	1·7	3·9	3·5	—	1·7	1·0	57·7
Surat	23·2	2·4	2·5	1·9	5·4	0·6	1·2	1·3	61·5
Broach	20·6	3·6	6·6	4·6	3·4	—	0·6	2·3	58·3
Baroda	8·8	4·4	5·0	1·9	8·9	0·3	0·8	0·4	69·5
Kheda	2·7	2·9	11·0	1·1	4·0	—	1·4	0·6	76·3
Panch Mahals	26·5	3·6	3·4	3·3	5·1	—	3·1	0·6	54·4
Sabarkantha	8·8	12·4	1·6	3·8	4·3	—	4·2	2·0	62·9
Banaskantha	10·8	4·9	2·2	2·4	5·9	0·4	11·4	1·0	61·0
Mehsana .	2·4	0·6	4·2	5·0	8·3	0·4	2·9	0·7	75·5
Ahmedabad	0·2	10·8	6·4	3·4	2·8	—	2·5	2·8	71·1
Gandhinagar	—	4·0	4·4	—	8·9	—	3·4	0·8	78·5
Surendranagar	1·3	16·0	3·2	3·7	4·0	—	2·8	3·7	65·3
Bhavnagar	3·2	7·0	4·3	3·7	9·8	—	5·9	3·1	63·0
Rajkot .	3·2	10·9	4·7	1·7	9·8	—	2·1	1·2	66·4
Amreli .	4·3	3·6	4·6	1·8	7·2	—	3·5	1·7	73·3
Junagadh .	17·9	2·8	4·3	1·0	13·2	0·1	2·4	0·7	57·6
Jamnagar	7·4	15·4	4·2	2·7	7·4	0·2	1·7	3·9	57·1
Kutch	2·3	73·0	0·5	3·5	1·9	—	5·1	3·4	10·3

Soils

3.5 In Kutch, saline and alkaline soils cover the area to the north of Lat. 23½°N. A narrow strip below this consists of red and brown soils. In the rest of the district, black soils prevail deep in the western half and medium elsewhere except for a narrow strip in the east with grey brown soils. In Saurashtra, Jamnagar coastal strip has saline and alkaline soils and coastal alluvium elsewhere along the coast. Rest of Amrel and Bhavnagar districts has deep black soils. Rajkot and Jamnagar (excluding coast) and southern portion of Junagadh have mainly medium black soils. North eastern part of Junagadh has mixed red and black soils. Surendranagar district has grey brown soils and this belt extends to Banaskantha in the north and Kaira in the east. Kaira, Ahmedabad, Mehsana and eastern half of Banaskantha districts form a continuous area with Surendranagar district and adjoining eastern portion of Kutch, which have grey brown soils. The remaining part of the region has black soils. These are deep black in Surat, Broach and adjoining Baroda or Vadodara. In the rest of the area the soils are medium black. Desert soils are appearing in the western half of Banaskantha district.

Rainfall

3.6 The annual rainfall in the State varies widely from less than 30 cm in the western half of Kutch to more than 150 cm in the southern most districts of Bulsar (Valsad) and Dang. A major feature is that 95 per cent of the total annual rainfall occurs during June to September. July is the month of maximum rainfall accounting for 40 per cent of annual rainfall followed by August with 25 per cent. Kutch area is the zone of lowest rainfall which ranges from 26 to 40 cm, July getting about 15 cm followed by August with 8 cm. In Saurashtra region, rainfall varies from less than 40 cm to 100 cm with a zonal average of 60 cm. Junagadh district has the heaviest rainfall of 100 cm and Okhmanal area less than 40 cm. In northern and eastern districts, rainfall varies from 50 to 97 cm. Mehsana and Banaskantha districts are in the low rainfall zone with averages of 50 to 55 cm and Idar has the maximum with 97 cm. In southern districts, the rainfall varies from 78 cm in Kheda to 173 cm in Valsad.

3.7 In June, coefficient of variation (CV) of rainfall exceeds 80 over Kutch and most of Saurashtra and CV values of July are reduced to 50 to 60 in Gujarat region and 60 to 80 in Saurashtra. CV in August increases to 60 to 80 over Gujarat region and western half of Saurashtra and exceeds 80 in the rest of the area. In September, CV exceeds 80 in Gujarat region and it is above 100 in the rest of the State. Seasonal variability continue to be high. CV ranges between 30 and 40 in Gujarat region and more than 40 elsewhere. CV exceeds 60 in western half of Kutch. Saurashtra and Kutch are areas of high variability with large variations in rainfall from year to year. Gujarat region with higher rainfall is better but CV continues to be high.

Temperature

3.8 Monthly and annual normal maximum, minimum and daily mean temperatures for 13 observatory stations in Gujarat are given in Tables 6-8. There is large unformity in mean daily temperature during July to September. The variation in the whole State is mostly less than 2°C (27°—29°C). This is nearly so even during October. Between July and August the variations are small and generally less than 1.5°C.

Potential Evapotranspiration (PE)

3.9 Evapotranspiration data are given in Table 9. Saurashtra and Kutch region have high values of PE exceeding 180 cm annually. Rajkot area has PE exceeding 200 cm.

TABLE 6

Normals of Daily Maximum Temperature (°C)

Station	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec	Annual
Jamnagar	26·4	28·8	32·9	35·5	36·1	35·9	32·3	31·5	31·9	34·4	31·3	27·8	31·2
Dwarka	25·4	26·4	28·2	29·7	31·2	31·9	30·2	29·3	29·5	30·7	30·8	27·5	29·2
Rajkot	28·1	30·7	35·3	38·8	40·5	37·8	32·6	31·6	32·9	35·4	33·2	29·6	33·9
Bhavnagar	27·6	30·3	34·7	37·6	39·6	37·6	33·2	32·3	33·2	34·2	31·6	20·6	33·4
Veraval	38·6	29·2	31·1	31·5	31·1	31·3	29·5	28·8	29·6	32·8	32·9	30·4	30·6
Bhuj	26·1	29·1	34·0	37·6	38·7	36·7	33·0	31·7	33·2	35·6	32·3	28·0	33·0
Surat	31·4	33·1	36·1	37·3	36·2	33·7	30·5	30·3	31·6	35·5	34·9	32·8	33·6
Broach	31·4	34·3	37·6	40·0	39·7	35·4	32·0	31·1	32·7	35·9	35·1	33·0	34·9
Baroda	30·1	32·4	35·6	39·9	40·7	37·2	32·4	41·5	32·6	35·6	33·4	31.0	34·4
Dohad	26·9	30·3	34·9	38·4	39·4	35·9	30·4	29·0	30·3	33·3	31·5	29·1	42·5
Ahmedabad	28·7	31·0	35·7	39·7	40·7	38·0	33·2	31·8	33·1	35·6	33·0	29·6	34·2
Deesa	27·8	32·1	35·5	39·2	41·3	38·9	33·4	32·2	33·0	35·7	33·1	29·8	33·3
Radhanpur	27·6	30·9	35·3	38·7	41·7	38·8	34·2	32·1	33·8	35·5	32·7	29·0	34·2
Dahanu	27·7	28·2	30·3	32·0	32·9	32·1	29·7	29·1	29·6	31·7	31·9	29·7	30·4

TABLE 7

Normals of Daily Minimum Temperature (°C)

Station	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec	Annual
Jamnagar	10·6	13·0	17·6	21·4	25·4	27·1	26·2	25·4	23·9	21·5	16·1	12·1	20·0
Dwarka	16·1	17·7	21·5	24·7	27·0	28·2	26·9	26·0	25·4	23·9	20·5	17·0	22·9
Rajkot	10·7	13·1	17·2	21·3	24·7	26·2	24·9	24·0	22·9	20·9	16·5	12·3	19·6
Bhavnagar	11·1	14·9	19·6	23·9	26·0	27·1	26·0	24·8	24·2	22·5	18·0	14·2	21·0
Veraval	14·3	15·4	18·4	22·0	25·9	27·6	26·2	25·5	24·6	22·3	18·8	15·8	21·4
Bhuj	10·1	12·9	18·3	22·7	25·6	27·4	26·3	25·3	24·1	21·5	15·6	11·2	20·1
Surat	14·8	16·4	20·1	23·7	26·6	27·1	25·7	25·4	24·1	23·1	19·2	16·0	21·9
Broach	12·8	14·9	19·8	23·7	26·9	26·9	25·7	25·1	24·5	22·1	17·2	14·0	21·1
Baroda	10·8	12·7	16·6	21·7	26·1	27·1	25·4	24·8	24·1	19·9	14·3	11·4	19·6
Dohad	12·1	14·5	19·3	24·0	26·0	25·6	24·0	23·0	22·6	20·0	15·3	12·7	19·9
Ahmedabad	11·9	14·5	18·6	23·0	26·3	27·4	25·7	24·6	24·2	21·2	16·1	12·6	20·5
Deesa	10·4	12·2	17·3	21·6	25·8	27·2	25·5	24·5	23·5	19·3	14·0	11·1	19·4
Radhanpur	9·8	12·7	16·9	21·4	24·8	26·3	24·4	24·0	24·0	19·3	15·1	11·1	19·1
Dahanu	16·8	17·5	21·0	23·9	26·8	26·4	25·1	24·8	24·3	23·0	20·0	17·9	22·3

TABLE 8

Normals of Daily Mean Temperature (°C)

Station	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec	Annual
Jamnagar	18·5	20·9	25·3	28·5	30·8	31·5	29·3	28·5	27·9	20·0	24·2	20·0	26·1
Dwarka	20·8	22·1	24·9	27·2	29·1	30·1	28·6	27·7	27·5	27·3	25·7	22·3	26·1
Rajkot	19·4	21·9	26·3	30·1	32·6	32·0	20·0	27·8	27·9	28·2	24·9	21·0	26·8
Bhavnagar	19·4	22·6	27·2	30·8	32·8	32·4	29·6	28·6	28·7	28·4	24·8	21·4	27·2
Veraval	21·5	22·3	24·8	26·8	28·5	29·5	27·9	27·2	27·1	27·6	25·9	23·1	26·0
Bhuj	18·1	21·0	26·2	30·2	32·2	32·1	29·7	28·5	28·7	28·6	23·9	19·6	26·6
Surat	23·1	24·8	28·1	30·5	31·4	30·4	28·1	27·9	27·9	29·3	27·1	24·4	27·8
Broach	22·1	24·6	28·7	31·9	33·3	31·2	28·9	28·1	28·6	29·0	26·2	23·5	28·0
Baroda	20·5	22·6	26·6	30·8	33·4	32·2	28·9	28·2	28·4	27·8	23·9	21·2	27·0
Dohad	19·5	32·4	27·1	31·2	32·7	30·8	27·2	26·0	26·5	26·7	23·4	20·9	26·2
Ahmedabad	20·3	22·8	27·2	31·4	33·5	32·7	29·5	28·2	28·7	28·4	24·6	21·2	27·4
Deesa	19·1	22·2	26·4	30·4	33·6	33·1	29·5	28·4	28·3	27·5	23·6	20·5	26·9
Radhanpur	18·7	21·8	26·1	30·1	33·3	32·6	29·3	28·1	29·9	27·4	23·9	20·1	26·7
Dahanu	22·3	22·9	25·7	28·0	29·9	29·3	27·4	27·0	27·0	27·4	26·0	23·0	26·4

TABLE 9

Normal Monthly and Annual Potential Evapotranspiration (PE)

(mm)

Station	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec	Annual
Gujarat region (including Daman, Dadra and Nagar Haveli)													
Radhanpur	84·2	104·5	158·2	193·9	208·0	224·7	155·8	128.0	138·3	138·0	98·8	77·6	1750·5
Ahmedabad	89·6	104·7	164·4	197·7	234·8	490·0	131·0	116·7	133·7	139·6	99·3	73·9	1676·8
Baroda	82·2	97·6	144·9	180·8	226·7	185·0	120·1	114·1	124·1	129·9	92·9	76·2	1574·9
Broach	98·4	115·3	167·1	200·3	237·4	180·1	129·2	118·3	134·1	143·7	109·3	93·9	1727·8
Surat	99·6	114·9	162·4	185·7	202·0	152·4	190·2	107·9	114·6	141·5	116·2	99·2	1606·3
Saurashtra & Kutch (including Diu)													
Bhuj	92·9	109·9	162·8	209·4	266·2	226·0	168·0	153·8	160·2	158·0	107·5	81·8	1897·1
Jamnagar	93·1	106·6	155·6	188·8	224·9	191·8	143·7	135·9	133·7	142·0	108·9	86·6	1714·1
Dwarka	118·5	124·6	165·5	181·7	195·7	177·1	141·0	130·7	138·0	150·4	134·1	116·1	1773·9
Rajkot	120·7	138·4	205·7	249·4	302·4	239·9	169·8	150·0	154·4	168·6	131·1	113·6	2144·6
Bhavnagar	99·2	119·6	176·3	210·2	245·4	198·8	145·6	134·0	134·8	144·0	112·2	94·4	1815·2
Veraval	115·3	124·0	167·5	181·3	183·4	159·6	123·1	114·4	128·3	148·9	126·0	113·2	1685·5

4. RAINFALL ZONES, THEIR CROPPING AND LIVESTOCK PATTERNS

4.1 The State is divide into 14 rainfall zones. These are indicated below together with the number of taluks included in each and their total approximate area :—

Rainfall zone	*Rainfall pattern*	*Reporting area Sq km*	*Number of taluks*
I	E_4 ($C_1D_1E_2$) E_4	21,605	11
II	E_4 (C_1D_3) E_4	5,796	8
III	E_4 ($C_2D_1E_1$) E_4	11,704	11
IV	E_4 (C_2D_2) E_4	8,669	9
V	E_4 (B_1 C_1E_2) E_4	36,913	41
VI	E_4 (B_1 C_2E_1) E_4	16,729	17
VII	E_4 (B_2E_2) E_4	4,231	4
VIII	E_4 (B_2C_2) E_4	5,054	6
IX	E_4 (A_1C_3) E_4	9,844	16
X	E_4 (A_1B_1 C_1E_1) E_4	9,558	14
XI	E_4 (A_1B_1 C_2) E_4	15,950	23
XII	E_4 (A_2B_1 C_1) E_4	7,661	15
XIII	E_4 (A_2B_2) E_4	2,195	4
XIV	E_4 (A_3B_1) E_4	4,632	5

Rainfall Zone I—E_4 ($C_1D_1E_2$) E_4

4.2 The districts and taluks included in the zone alongwith the cropping patterns are given below :

Cropping pattern	*Taluk*	*District*
JK_3 C_4 F_4	Mundra	Kutch
	Anjar	,,
B_3 F_4 Jk_4 Pu_4/W_4	Abdasa	,,
	Rapar	,,
	Bhachau	,,
B_3 Gn_3 Pu_4 F_7 Jk_4 B_7 Gn_4 Pu_4 B_4 F_4/Jk_4	Lakhpat	,,
	Bhuj	,,
	Mandvi	,,
B_2 Jk_4 Gn_3 B_4 Jk_4/C_4	Nakhatrana	,,
	Okhamandal (dwarka)	Jamnagar
	Kalyanpur	,,

4.3 This is the largest zone, covering onefourth of the total area of the State. It comprises Kutch district and two taluks of Jamnagar. The area of Kutch district is over 44,000 sq km. The population density of the zone is 50 per sq km, excepting Anjar and Okhamandal taluks which have a density of 109 and 107 respectively. Lakhapat taluk has the lowest density of 11.

4.4 The elevation of the zone is below 150 masl. In two taluks of Bhuj and Nakhatarana, however, the maximum elevation ranges from 300 to 400 masl. The coastal belt consists of coastal or deltaic alluvium soil. Deep or medium back soils and saline and alkaline soils predominate over rest of the area.

4.5 Details in respect of barren and uncultivable land are not available for taluk areas. But in Kutch district the barren and uncultivable lands account for 73 per cent of the geographical area. Fallow lands vary from a few per cent to 42 per cent in Abadasa. The net sown area is consequently very low. Net sown area is the lowest in Lakhpat being only 0.3 per cent but increases in Kutch to 11 per cent, in Bhuj to 17 and in Mandvi to 26, in Kalyanpur to 59 per cent and in Okhamandal to 33 per cent.

4.6 The area irrigated is low but in a few taluks where the net sown area is itself extremely small, a sizeable portion is irrigated. In Mandvi 33 per cent of net sown area is irrigated and in Lakhatrana 28 per cent.

4.7 This is the zone of lowest annual rainfall in the whole State having an average of only 33 cm. The individual taluks receive between 25 to 45 cm rainfall. The month of maximum rainfall is July with an average of 15 cm and together with August, which is the next rainiest with 8 cm, accounts for about 70 per cent of annual total. The number of rainy days in these two months is 10. June and September get 3 to 4 cm. Rainfall in the other months hardly totals to even one cm and is negligible.

4.8 The cropped area of the zone is 617 thousand ha representing 6 per cent of the gross cropped area of the State, and the principal crops of the zone are bajra, jowar (kharif), fodder, other pulses, cotton and groundnut together occupying more than 90 per cent of the cropped area. This is the only zone which has a taluk with other pulses as dominant crop.

4.9 The yields of crops for Kutch and Jamnagar districts are given in Table 10. It will be seen that the yields of pulses and jowar are low being 31 and 19 to 25 per cent respectively of all-India average. Bajra yields are well above all-India being more than 120 per cent. Groundnut yield is normal. Cotton yields are good, being more than 150 per cent of all-India, which is higher than the State average of 144.

4.10 Goats and sheep are the largest in numbers in the zone. Goats constitute 25 per cent of total livestock population in most of the taluks of Kutch district but their average is 29 per cent for the entire zone. Male, female and young stock of cattle each range between 10 and 20 per cent. Female buffaloes and its yound stock are only a few per cent. Goats, sheep and cattle together account for more than 80 per cent of livestock. The livestock patterns are :

Taluk	*Livestock pattern*
Lakhpat, Nakhatrana	G_3 Cf_4 Cy_4
Abdasa, Bachhau, Bhuj, Mandvi	G_4 S_4 Cf_4
Rapar	S_3 G_4 Cm_4/Cf_4
Mundra, Anjar, Okhamandal, Kalyanpur	S_4 Cm_4 Cf_4 G_4/Cy_4

TABLE 10

Relative Yield Index of Principal Crops in Zone I

	Area '000 ha.	per cent of gross cropped area	RYI*	
			District Kutch	District Jamnagar
Jowar (kharif)	86	14·3	19	25
bajra	107	17·8	127	121
wheat	12	1·9	113	112
pulses	80	13	31	—
groundnut	36	6	106	77
cotton	45	7·5	177	155

*RYI or Relative Yield Index represents district yield expressed as percentage of the corresponding all-India average yield for 1968-69 & 1970-71.

Rainfall Zone II— $E_4(C_1\ D_3)\ E_4$

4.11 The districts and taluks included in the zone alongwith their cropping patterns are given below :

Cropping Pattern	*Taluk*	*District*
Gn_3 B_4 Jk_4/C_4	Liliya	Amreli
	Lathi	,,
Gn_2 B_4/Jk_4	Khambha	,,
	Dhari	,,
	Amreli	,,
	Babra	,,
Gn_3 B_3	Savarkundla	Bhavnagar
	Gariadhar	,,

4.12 The area of the zone is 5,796 sq km. All the taluks excepting Savarkundla and Dhari which cover more than 1,000 sq km are between 400 and 830 sq km in area. The elevations vary between 100 and 250 masl excepting Khambha where the maximum elevation is 529 masl. Mainly deep black soils predominate in the zone and irrigation is negligible except in Amreli which has 11 per cent of the cropped area under irrigation.

4.13 Forests occupy negligible area. Fallow lands are very small excepting in Dhari where these occupy 11 per cent. Permanent pastures cover 5—10 per cent area excepting in Savarkundla and Gariadhar where these account for aout 20 per cent. Detailed taluk data on barren and uncultivated lands are not available but the district averages for such lands are 5 per cent in Amreli and 13 per cent in Bhavnagar. The net sown area is, therefore, high ranging between 61 and 85 per cent of geographical areas of the taluks. In Lathi, Amreli, Gariadhar and Lila the net sown area exceeds 80 per cent, the average for the zone being 75 per cent.

4.14 The annual average rainfall based on the 10 years data is 53 cm. July is the month of maximum rainfall with an average of 18 cm which represents 33 per cent of the annual precipitation. July and August together account for more than 50 per cent of annual rainfall. Rainfall of the other months is between 5 to 10 cm.

4.15 The cropped area of the zone is 3.6 per cent of the gross cropped area in the State. Fifty per cent of the area is under groundnut, followed by bajra and jowar with 24 and 12 per cent respectively. There are 4 taluks which have 50 to 60 per cent area under groundnut. Bajra generally varies between 20 and 35 per cent excepting in Babra where jowar covers about 20 per cent and area under bajra is negligible.

4.16 The relative yield index values of principal crops are given in Table 11. Groundnut yields are close to all-India level. The yields of bajra are excellent being nearly twice the all-India value in Amreli but Kharif jowar yield is on the low side though better than that in Zone I.

4.17 Sheep are larger in number than the rest of the animals except in Khambha and Dhari taluks where male cattle predominate. Male cattle and goats constitute 19 and 17 per cent of the livestock population of the zone respectively. Female cattle and young stock are nearly equal in number. Female buffaloes are 10 per cent or higher only in a few taluks. Young stock of buffaloes is about 7 per cent.

The livestock patterns are :

Dhari, Khambha } $Cm_4\ Cf_4\ Cy_4\ G_4$

rest of the zone $S_4\ G_4\ Cm_4\ Cf_4$

TABLE 11

Relative Yield Index of Principal Crops in Zone II

District	Crop	Area '000 ha	Per cent of gross cropped area	RYI*
Amreli	groundnut	232	45·0	96
	bajra	65	12·7	193
	jowar (kharif)	65	12·7	61
Bhavnagar	groundnut	176	27·9	93
	bajra	192	30·4	167
	jowar (kharif)	104	16·5	35

*RYI or Relative Yield Index represents district yield expressed as percentage of the corresponding all-India average yield for 1968-69 to 1970-71.

Rainfall Zone III— $E_4\ (C_2D_1\ E_1)\ E_4$

4.18 The districts and taluks included in the zone and their cropping patterns are given below :

Cropping pattern	*Taluk*	*District*
$B_4\ Jk_4\ W_4\ O_4/G_4/Gn_4$	Chanasma	Mehsana
	Harij	,,
$C_3Jk_4(B_4)$	Sami	,,
$Gn_3\ Jk_4\ B_4$	Jodiya	Jamnagar
$B_2\ F_4$	Vav	Banaskantha
	Tharad	,,
	Deodar	,,
	Santalpur	,,
$B_3\ Jk_4\ F_4/C_4(W_5)$	Dhanera	,,
	Radhanpur	,,
	Kankrej	,,

4.19 The area of this zone is 11,704 sq. km. A number of taluks of this zone have areas between 1,200 and 1,700 sq. km., but Harij taluk has the lowest area of 407 sq km. Almost the entire zone is between sea level and 100 masl excepting Dhanera taluk where the heights vary between 150 and 200 masl. Only five taluks have population density exceeding 100 per sq km. However, the highest density of 197 is in Chanasma and the lowest of 41 in Santalpur. Grey brown or desert soils predominate in the zone. Kankrej has 27 per cent irrigated area followed by Dhanera and Chanasma with 15 per cent. Elsewhere irrigation is negligible.

4.20 Mehsana district has practically no forests but the area under forests in Banaskantha district is 11 per cent of the reporting area. Fallow lands are 28 per cent in Santalpur followed by Radhanpur 21 per cent and Vav 19 per cent. Five to 10 per cent of area is under permanent pastures in a number of taluks. The net sown area is high being 70 to 85 per cent over most of the zone.

4.21 The average annual rainfall is 45 cm. July is the month of maximum rainfall with an average of 15 cm August gets 10-12 cm and September 8 to 10 cm of rainfall. June rainfall is less than 5 cm. July and August together account for 60 per cent of annual precipitation.

4.22 The cropped area of the zone is 835 thousand ha representing 8 per cent of the total cropped area in the State. The main crops are bajra, jowar, fodder, cotton and wheat. Three taluks have over 10 per cent of cropped area under fodder crops. In five taluks of Banaskantha district bajra occupies 50 to 67 per cent of total cropped area. Cotton is confined to a few taluks in Mehsana district, Sami taluk has 46 per cent of cropped area under cotton. Jowar is grown on 6 to 25 per cent area.

4.23 The relative yield index values of the crops of Banaskantha and Mehsana districts are given in Table 12. The yield of jowar is less than half of all-India average, yield of bajra is 73 per cent of all-India in Banaskantha but in Mehsana, the yield is 190 per cent of all-India average. Cotton yields are about twice of all-India yields. Yields of wheat in both the districts are well above the all-India level.

4.24 Sheep population is the highest in five taluks, their percentages ranging between 24 and 38. In Jodiya and Vav taluks sheep account for 34 and 38 per cent respectively of the total livestock population. Goats constitute 16 to 25 per cent followed by male cattle whose number ranges from 11 to 23 per cent. Female and young stock of cattle average 14 per cent and 11 per cent respectively. Male buffaloes are almost absent. Female buffaloes are generally between 7 to 11 per cent but in two taluks Chanasama and Harij, they form 20 and 14 per cent of the total livestock population. The livestock patterns are :

Taluk	*Pattern*
Jodiya, Vav	$S_3\ G_4\ Cm_4$
Santalpur, Tharad, Dhaneru, Deodar, Kankrej, Radhanpur	$S_4\ Cm_4\ Cf_4\ G_4$
Chanasma, Sami, Harij	$G_4\ Cm_4\ Cf_4\ S_4/Bf_4/Cy_4$
	$Cm_4\ Cf_4\ G_4\ Cy_4/Bf_4$

TABLE 12

Relative Yield Index of Principal Crops in Zone III

District/crop	Area '000 ha	per cent of gross cropped area	RYI*
Banaskantha			
bajra	314	34·4	73
jowar (kharif)	110	12·0	44
wheat	53	5·7	112
cotton	22	2·4	150
Mehsana			
bajra	202	26·1	190
jowar (kharif)	140	18·1	44
wheat	73	9·4	139
cotton	67	8·6	204

*RYI or Relative Yield Index represents district yield expressed aspercentage of the corresponding all-India average yield for 1968-69 to 1970-71.

Rainfall Zone IV— $E_4\ (C_2\ D_2)\ E_4$

4.25 The districts and taluks included in the zone and their cropping patterns are :

Cropping Pattern	*Taluk*	*District*
$B_3\ Gn_4\ C_4\ Jk_4/F_4$	Sayla	Surendranagar
$C_2\ Jk_4/B_4$	Dasada	,,
	Limbdi	,,
$C_3\ Jk_4\ B_4$	Wadhwan	,,
	Muli	,,
$B_3\ Gn_4\ Jk_4$	Umrala	Bhavnagar
	Gadhada	,,
	Sehor	,,
$Jk_3\ B_4\ Gn_4/W_4$	Vallabhipur	,,

4.26 The area of the zone is 8,669 sq km. Areas of taluks vary from 400 to 1,700 sq km although areas of Limbdi and Dasada taluks are 1,713 and 1,634 sq km. Elevations in all the taluks excepting Sayla are between sea level and 150 masl. Elevations in Sayla, range between 150 and 237 masl. Soils in Surendranagar district are deep or medium black and grey brown and in Bhavnagar district deep black and coastal alluvium. Based on data for recent few years, July receives the highest rainfall, although there are wide variations. The rainfall of this zone is not high, being 45-55 cm annually. Sixty to Seventy per cent of the annual rainfall occurs in the months July and August. Wadhwan has a population density of 202 per sq km followed by Sehor and Umrala with 137 and 133 respectively. In other taluks density is less than 100.

4.27 Fallow, pasture and cultivable waste lands are negligible excepting in Umrala and Vallabhipur where 25 and 11 per cent of the area is fallow. The net sown area generally ranges between 50 and 70 per cent.

4.28 Irrigation is almost negligible excepting in Wadhwan, Muli and Vallabhipur which have 10 to 15 per cent area irrigated.

4.29 The cropped area of the zone is 568 thousand ha which corresponds to about 5 per cent of the total cropped area of the entire State. The main crops are cotton, bajra, jowar, groundnut and wheat which occupy 36, 21, 19, 11 and 5 per cent of cropped area respectively. Cotton in Dasada taluk covers 67 per cent area and in Limbdi and Wadhwan about 50 per cent. Bajra occurs all over the zone but its area varies widely from 8 per cent in Dasada to 45 per cent in Umrala.

Jowar is uniformally distributed except in Vallabhipur, where it occupies 45 per cent area.

4.30 The relative yield index values of crops are given in Table 13. Yields of cotton are on the high side. Yields of groundnut vary widely in the zone with as low as 44 per cent of all-India in Surendranagar and 93 per cent in Bhavnagar of all-India average. Wheat yields in the zone are satisfactory. Yield of bajra are low in Surendranagar being only 65 per cent but in Bhavnagar the yield is very high being 167 per cent of the all-India average. Jowar (kharif) yields are extremely low.

4.31 Sheep population is 25 to 30 per cent of the livestock population in the taluks of Sihor, Gadhada and Umrala. Elsewhere, goats or male cattle are larger in number. However, none of the livestock in any taluk of the zone exceeds 30 per cent of the total of the corresponding taluk.

The patterns are :

Taluk	*Pattern*
Muli, Umrala, Gadhada, Sihor, Sayala	S_4 Cm_4 Cf_4 G_4
Dasada, Eimbdi, Vallabhipur	Cm_4 Cf_4 Cy_4 G_4/S_4 Bf_4
Wadhwan	G_4 Cm_4 Cf_4 Cy_4

TABLE 13

The Relative Yield Index of Principal Crops in Zone IV

District Crop	'Area '000 ha	Per cent of gross cropped area	RYI*
Surendranagar			
jowar (kharif)	122	17·7	15
bajra	133	19·3	65
wheat	20	30·0	153
groundnut	50	7·2	44
cotton	296	42·9	85
Bhavnagar			
jowar (kharif)	104	16·5	35
bajra	192	30·4	167
wheat	26	4·1	109
groundnut	177	28·0	93
cotton	32	5·0	153

*RYI or Relative Yield Index represents district yield expressed as percentage of the corresponding all-India yield for 1968-69 to 1970-71.

Rainfall Zone V— E_4 (B_1 C_1 E_2) E_4

4.32 The districts and taluks included in the zone alongwith their cropping patterns are given below :

Cropping pattern	*Taluk*	*District*
Gn_1	Bhanvad	Jamnagar
	Jamjodhpur	,,
	Kalavad	,,
Gn_2 Jk_4/B_4	Khambhaliya	,,
	Lalpur	,,
Gn_3 Jk_4 B_4	Jamnagar	,,
	Dhrol	,,
B_3 Gn_4 Jk_4	Una	Junagadh
Gn_1	Bhesan	,,
Gn_2 $W_4/C_4/Jr_4$	Visavadar	,,
Gn_3 B_4 Jk_4	Patan Veraval	,,
Gn_3 C_4 F_4/Jr_4	Ranavav	,,
	Kutiyana	,,
Gn_4 Jr_4 F_4 B_4	Porbandar	,,
B_3 Gn_4 S_4	Kodinar	Amreli
B_3 Jk_4 Gn_4	Rajula	,,
	Jafrabad	,,
Gn_1	Kunkavav-Vadia	Amreli
	Dhoraji	Rajkot
	Jetpur	,,
	Jamkondarna	,,
	Gondal	,,
	Lodhika	,,
	Paddhari	,,
	Kotda Sangani	,,
	Upleta	,,
Gn_2 B_4/C_4	Rajkot	,,
	Jasdan	,,
Gn_3 B_4 Jk_4/C_4	Morvi	,,
	Wankaner	,,
C_3 Jk_4/B_4	Maliya	,,
B_3 Gn_4 Jk_4/F_4	Ghotila	Surendranagar
C_2 Jk_4/B_4	Lakhtar	,,
	Halvad	,,
	Dhrangadhra	,,
B_4 Jk_4 W_4 $O_4/C_4/Gn_4$	Patan	Mehsana
	Sidhpur	,,
	Kheralu	,,
	Mehsana	,,
B_4 Jk_4 W_4/F_4	Vadgam	Banaskantha
C_2 Jk_4	Viramgam	Ahmedabad

4.33 It is the second biggest zone having an area of 36,913 sq km and covering 41 taluks of the districts of Jamnagar, Surendranagar, Amreli, Rajkot, Junagadh Mehsana, Banaskantha and Ahmedabad. The areas of the taluks vary widely from 300 sq km to 1,700 sq km, more than 40 per cent of the taluks having area exceeding 1,000 sq km. The maximum and minimum heights in most of the taluks vary between sea level and 300 masl. In Bhesan taluk, however, the elevations

range from 150 to 600 masl. The total population of the zone is 5.3 million with an average density of 144 per sq. km. The density varies very considerably from 67 in Lalpur to 371 in Rajkot, which is the highest for the zone. Density in Sidhpur is 350 and Veraval (Patan) with 278 followed by Mehsana with 311, Jamnagar with 294. Eight of the taluks have density between 67 and 80.

4.34 Permanent pastures and other grazing lands occupy 8 per cent of the geographical area of the zone. Individually in a number of taluks these vary upto 15 per cent. Land not available for cultivation is 13 per cent and fallow lands account for 3 per cent. This leaves only two-thirds of the geographical area as net sown area. In individual taluks there is considerable variation in the proportion of net area sown to total reporting area from 41 to 84 per cent.

4.35 Fourteen per cent of the area of the zone is irrigated. In taluks of Patan, Sidhpur, Kheralu, Mehsana and Vadgam 20 to 30 per cent area is irrigated. There are a number of taluks where irrigation is 10 to 20 per cent but inapleta and Dhoraji taluks the area irrigated is 30 to 34 per cent. Soils in Jamnagar, Junagadh, Amreli and Rajkot districts are coastal alluvium or medium black mostly except for a patch of red and black soils in Junagadh (northern portion). In other parts of the zone, the soils are grey brown.

4.36 The annual average rainfall of the zone is 60 cm, individual values varying between 45 and 75 cm, July is the month of maximum rainfall. July and August together account for two-thirds of the annual rainfall of the Zone. July and August each get more than 10 cm/pm.

4.37 The gross cropped area of the zone is 2,513 thousand hectares, representing one-fourth of the gross cropped area of the State. The principal crops of the zone are groundnut, bajra, jowar and cotton, occupying respectively 38, 18, 15 and 13 per cent of the gross cropped area. Fodder, other oilseeds and other pulses have 1-3 per cent and sugarcane and jowar (rabi) less than 1 per cent. Groundnut is a dominant crop in 12 taluks accounting for 70 per cent or more of area. Bajra is grown throughout the zone, but excepting in Amreli, Mehsana and Surendranagar the areas are not high. Area under jowar (kharif) is less than 10 per cent excepting in Surendranagar and Mehsana, where it ranges between 10 and 30 per cent. A few taluks of Jamnagar also have 20 to 35 per cent area under jower (kharif). Jowar (rabi) is significant only in two taluks of Porbandar and Kutiyana. Cotton is significant in Surendranagar and in taluks of Rajkot and Viramgam. Elsewhere, cotton area is less than 10 per cent.

4.38 Relative yield index values of crops are given in Table 14. Jowar (kharif) has got the lowest yield being about 43 per cent of all-India average. On the other hand, rabi jowar yields are very high in areas where it is grown. Bajra yields are on the whole high being 120 to 200 per cent of all-India level. Only in Surendranagar bajra yield is low. Yields of groundnut in Junagadh are the highest with 137 per cent of all-India. The lowest yield is in Surendranagar. Cotton yields are all very high except in Surendranagar where it is as low as 85 per cent of all-India. This is also lowest in the whole State, the State average being 144 per cent of all-India average.

4.39 Among livestock, the highest population in the zone is that of sheep which account for a significant proportion in Junagarh, Jamnagar, Surendranagar and Rajkot districts. Male cattle, goats, female cattle, young stock of cattle and female buffaloes are nearly equal in number. The rest are negligible. The livestock patterns are :

Taluk	*Pattern*
Lodhika, Kotda	$S_3\ Cm_4\ G_4$
Dharangdhara	$S_4\ Cm_4\ Cf_4\ G_4$
Khambhalia, Lalpur, Porbander	$S_4\ Cm_4\ Cf_4\ G_4/Cy_4$
Jamnagar, Kalvad, Padhari, Jamkundera, Jetpur, Gondal, Rajkot, Wankaner, Jasdan, Rajula	$S_4\ Cm_4\ Cf_4\ G_4$
Bhanvad, Jodhpur, Ramavat, Kutiyana, Upleta, Dhoraji	$Cm_4\ Bf_4\ S_4\ Cy_4/Cf_4$
Kodinar, Veraval	$Cm_4\ Cf_4\ Cy_4$
Una, Bhesan, Visavdar, Kumkav Vadar	$Cm_4\ Cf_4\ Cy_4\ G_4/S_4/Bf_4$
Jafrabad, Patan	
Viramgam, Lakhtar, Ghotila	$Cm_4\ Bf_4\ Cf_4\ Cy_4$
Vadgam, Sidhpur, Kheralu, Mehsana	$Bf_4\ By_4\ Cm_4\ G_4$

TABLE 14

The Relative Yield Index of Principal Crops in Zone V

Crop	District					
	Jam-nagar	Juna-gadh	Amreli	Raj-kot	Suren-dra-nagar	Meh-sana
paddy	67	65	70	67	—	63
jowar (kharif)	25	53	61	33	15	44
jowar (rabi)	—	168	—		170	
bajra	121	202	193	128	65	190
small millets	99	127	—	—	100	181
groundnut	77	137	96	82	44	80
cotton	155	201	154	156	85	204

NOTE : Relative Yield Index represents district yield expressed as a percentage of the corresponding all-India average yield for 1968-69 to 1970-71.

Rainfall Zone VI— E_4 (B_1 C_2 E_1) E_4

4.39 The districts and taluks included in the zone and their cropping patterns are :

Cropping Pattern	*Taluk*	*Districts*
B_3 Gn_4 Jk_4	Botad	Bhavnagar
	Palitana	,,
Jk_3 B_4Gn_4/W_4	Bhavnagar	,,
Gn_3 B_3	Ghogha	Bhavnagar
	Talaja	,,
	Mahuwa	,,
B_3 W_4 O_4 F_4/Jk_4	Vijapur	Mehsana
	Visnagar	,,
B_4 C_4 W_4 Jk_4	Kalol	,,
	Kadi	,,
B_3 Gn_4 C_4	Dehgam	Ahmedabad
	Dhandhuka	,,
C_3 Jk_4 W_4/Pd_4	Dholka	,,
	Sanand	,,
C_4 Mf_4 Pd_4 Jr_4/Gn_4 M_4	Jambugam	Vadodara
B_3 C_4 Jk_4 W_5	Gandhinagar	Gandhinagar
W_4 B_4 C_4 Pd_4	Gambay	Kheda

404. The zone comprise of 17 taluks in Ahmedabad (4), Gandhinagar (1), Mehsana (4), Bhavnagar (6), Vadodra (1) and Kheda (1) districts and covers an area of 16,729 sq km which is about 8 per cent of the area of the State. Areas of individual taluks vary between 437 and 2,719 sq km. The elevation ranges between sea-level and 170 masl except in Jambugam and Palitana, where the elevations are from 150 to 333 and 100-498 masl respectively. There is considerable variation in the type of soils which occur in the different districts of the zone as shown below :

Ahmedabad, Mehsana and Gandhinagar areas	grey brown soils
Bhavnagar	deep black soils and coastal alluvium
Kheda and Baroda (Vado or)	deepra mediumda black soils and coastal alluvium

In Mehsana, 20 to 35 per cent area is irrigated followed 10-20 per cent in Ahmedabad and Baroda taluks. The population density as greater than 300 per sq km in Mehsana and Gandhinagar and between 100 and 200 elsewhere, in general.

4.41 Fallow lands are small in area and cultivable waste less than 5 per cent of reporting area. Permanent pastures occupy 10-15 per cent in some of the taluks. The net sown area varies between 60 and 86 per cent excepting in a few taluks. In Bhavnagar taluk, the net sown area is only 25 per cent.

4.42 This is a zone of moderate rainfall, the annual total being 60 to 70 cm, the average for the whole zone is 67 cm. July is the month of maximum rainfall of 20-25 cm and July and August are the main rainy months which together account for 60 per cent of the annual precipitation. Month of July, August and September each generally receive more than 10 cm pm. Rainfall in June varies between 6 and 10 cm but in other months rainfall is negligible.

4.43 The cropped area of the zone is 1,167 thousand ha, which represents 10 per cent of the gross cropped area of the State. The principal crops are bajra covering 25 per cent followed by wheat with 13, cotton 20, jowar 13, groundnut 12 and fodder 6 per cent. Excluding taluks of Ahmedabad district bajra area is generally more than 30 per cent. In Bhavnagar, the main crops are bajra, groundnut and jowar, which together account for more than 70 per cent of the gross cropped area. In Mehsana, bajra, wheat fodder, other oilseeds and jowar constitute the main crops. Cotton also is grown to a noticeable extent in some of the taluks. Area under cotton is substantial in Ahmedabad. Wheat and jowar are grown over 10 to 20 per cent area and fodder crops occupy 10 per cent area in some of the taluks. In the remaining taluks bajra, wheat, cotton and jowar form the main crops.

4.44 The relative yield index values of the principal crops are given in Table 15. Except rice and jowar the yields are normal or very high. In regard to rice the rainfall average is 67 cm, which is insufficient for paddy crop without irrigation. In the absence of adequate irrigation facilities, yields can not improve. Cotton yields are very good being twice the all-India average in Mehsana followed by 153 per cent of all-India value in Bhavnagar and 125 per cent in Ahmedabad. Groundnut yields are low being less than 70 per cent of all-India average in Ahmedabad and only 80 per cent in Mehsana.

4.45 Sheep are dominant in Bhavnagar but are negligible in the rest of the zone. Male cattle are between 15 and 20 per cent though in some individual taluks, they constitute 26 to 33 per cent of total livestock. Female buffaloes preponderate in Mehsana and Ahmedabad. In Visnagar and Kalol taluks of Mehsana they are 30 per cent of the total livestock.

The livestock patterns of this zone are :

Taluk	*Pattern*
Dhanduka, Dholka, Sanand, Jambugam, Gandhinagar, Botad, Palitana	Cm_4 Bf_4 Cf_4 Cy_4
Ghogho, Mahuwa	S_4 G_4 Cm_4 Cf_4
Visnagar, Vijapur, Kadi, Kalol, Cambay	Bf_4 By_4 Cm_4 G_4

TABLE 15

Relative Yield Index of Principal Crops in Zone VI

Crop	District		
	Ahmedabad	Mehsana	Bhavnagar
rice	82	63	63
jowar (kharif)	28	44	35
bajra	173	190	167
wheat	73	139	109
groundnut	69	80	93
cotton	125	204	153

NOTE : Relative yield Index represents district yield expressed as percentage of the corresponding all-India average yield for 1968-69 to 1970-71.

Rainfall Zone VII—E_4 (B_2 E_2) E_4

4.46 The districts and taluks included in the zone along with their cropping patterns are given below :—

Cropping pattern	*Taluk*	*District*
B_3 Jk_4 W_5	Deesa	Banaskantha
B_4 Jk_4 W_4/F_4	Palanpur	Banaskantha
M_4 Mt_4 W_4 F_4 B_4	Danta	Banaskantha
M_3 C_4 W_5	Khedbrahma	Sabarkantha

4.47 The area of the zone is 4,231 sq km. Area of Danta and Khedbrahma taluks is around 850 sq km and that of Deesa and Palanpur more than 1,000 sq km. Elevations in Danta and Khedbrahma taluks range between 300 and 600 masl, in Palanpur from 150 to 1,090 masl and in Deesa from 135 to 205 masl. Main grey brown or desert soils dominate the zone. Khedbrahma has 85 per cent, Palanpur and Danta 20 to 30 per cent and Deesa 15 per cent area under irrigation. The population density varies between 80 and 219 per sq km. Palanpur has the highest density in the zone of 219 and the average density for the whole zone is 140.

4.48 Fallow land is negligible. Deesa and Palanpur have 9 to 17 per cent area under permanent pastures. Information about areas under forests in different taluks is not available but in Banaskantha district where Danta, Deesa and Palanpur are located, forest area is significant. The net sown area is 21 per cent in Danta, 2 per cent is Khedrahma and over 79 per cent of geographical area in Deesa and Palanpur.

4.49 The rainfall of the zone varies between 60 and 85 cm annually in 30 rainy days. July is the month of maximum rainfall, July and August together accounting for 60 to 70 per cent of annual precipitation. July and August are the months with more than 10 cm pm. July gets 25 to 30 cm rainfall and August 20 to 25 cm. Rainfall in June is 5 to 7 cm and in September 9 cm. Rainfall in other months is negligible.

4.50 The gross cropped area of the zone is 2.822 thousand ha, which is nearly 3 per cent of the total gross cropped area of the State. Bajra is dominant crop in Deesa and Palanpur districts and maize in rest of the zone. The principal crops of the zone are bajra, jowar, fodder and maize each accounting for 32,15,12 and 9 per cent of the cropped area respectively. Area under crops like wheat is 6 per cent, other oilseeds 5, other pulses and small millets 4 per cent each.

4.51 The relative yield index values of the crops are given in Table 16. Yield of cotton is 1½ times of all-India average and that of wheat higher than all-India. Yield of bajra is only 73 per cent of all-India and that of jowar 44 per cent.

4.52 Goats constitute 35 to 40 per cent of livestock population in Danta and Khedbrahma. In Dessa, Sheep account for 13 per cent but their number is not significant in the rest of the zone. Male cattle is 18 per cent, female cattle 15 per cent and young stock of cattle 11 per cent. Female buffaloes are significant in numbers in Palanpur. Elsewhere, they are about 8 per cent. The main livestock patterns of the zone are :

Taluk	*Pattern*
Khedbrahma, Danta	G_3 Cm_4 Cf_4
Palanpur, Deesa	G_4 Cm_4 Cf_4 Cy_4/Bf_4

TABLE-16

Relative Yield Index of Crops in Zone VII

Crop	Area '000 ha	Percent of gross cropped area	RYI*
bajra	314	34·4	74
jowar (kharif)	110	12·0	44
maize	136	1·5	92
wheat	52·6	5·7	112
cotton	22·1	2·4	150

*Relative Yield Index represents Banaskantha district yields expressed as percentage of the corresponding all-India average yields for 1968-69 to 1970-71.

Rainfall Zone VIII—E_4 (B_2 C_2) E_4

4.53 The districts and taluks included in the zone along with their cropping patterns are given below :—

Cropping Pattern	*Taluk*	*District*
B_4 M_4 Pd_4 R_4	Shehera	Panchmahals
M_3 Pd_4 $Gn_4/Mt_4/B_4$	Linkheda	,,
	Dohad	,,
M_4 Pd_4 Gn_4 G_4	Jhalod	,,
M_4 Pd_4 Gn_4 Mt_4/B_8	Lunavada	,,
C_3 Jr_4 Pd_4 To_4/Mt_4 (B_4 To_4)	Savli	Baroda

4.54 The area of the zone is 5,054 sq km, areas of individual taluks varying between 580 and 1064 sq km. Except for Savli which is at sea level, heights in the rest of the zone range between 100 and 500 masl. The soils are medium black. Area in Panchmahals, district is almost entirely irrigated but Savli has only 10 per cent irrigated area. The population of the zone is 10 lakhs and the population density 201 per sq km. Four of the six taluks have density close to 200, the highest density of 270 being in Dohad and the lowest of 153 in Limkheda.

4.55 Fallow lands are negligible and permanent pastures occupy 5 to 10 per cent area in 4 of the taluks. The net sown area varies between 40 and 60 per cent excepting Savli where it is around 80 per cent.

4.56 The average annual rainfall of the zone is about 80 cm. July is the month of maximum rainfall with 30 cm and with that of August contributes 60-65 per cent of the annual total. This is a zone of moderate rainfall with two months getting more than 20 cm pm.

4.57 The cropped area of the zone is about 304 thousand ha representing 3 per cent of the total cropped area in the State. The main crops of the zone are maize, paddy, cotton and groundnut occupying 28, 15, 10% each respectively. Bajra, gram and small millets cover between 6 and 7%, wheat, ragi and tobacco 3 and jowar (rabi) 2 per cent area in the zone. Excluding Savli, all the other taluks have significant area under maize; areas in Dohad and Limkheda being 49 and 44 per cent respectively. paddy is grown all over the zone in 10 to 20 per cent area. Lunavada and Limkheda have 22 per cent area under paddy. The zonal average for cotton of 10 per cent area is not representative and it is only Savli which has cotton occupying 41 per cent of the area. Areas under cotton in other taluks are negligible. Savli is the only taluk in the zone where tobacco is grown and the area covered is 14 per cent. Small millets are grown on 5 to 10 per cent of the area. Gram in Jhalod and Dohad occupies 10-12 per cent area.

4.58 The relative yield index values of crops are given in Table 17. The yield of rice is only 73 per cent of all-India average. The yield of maize is 93 per cent of all-India average. Groundnut yield is normal in the zone. Yields of jowar (rabi), bajra and cotton are high. Yields of small millets is twice of all-India average. An interesting feature is that the yield of gram is 89 per cent of all-India level.

4.59 Male cattle are the largest in number with an average of 30 per cent for the zone followed by goats with taluk values ranging between 13 to 33 per cent; their zonal average being 21 per cent. Female and young stock of cattle average 12-13 per cent of total livestock. Female buffaloes in Lunavada and Savli are 20 per cent of total livestock. Young stock of buffaloes are also important in the two taluks with 15 and 19 per cent respectively. The livestock patterns of the zone are :

Taluk	*Pattern*
Shehera, Limkheda, Dohad	$Cm_3\ G_4\ Cf_4$
Jhalod	$Cm_4\ G_4\ Cf_4/Cy_4$
Lunavada	$Cm_4\ Bf_4\ By_4\ G_4$

TABLE 17

Relative Yield Index of Principal Crops in Zone VIII

Crop	Area '000 ha	Per cent of gross Cropped Area	RYI*
rice	78	14·9	73
jowar (rabi)	7	1·3	168
bajra	40	7·8	140
maize	153	29·4	93
ragi	17	3·2	92
small millets	28	5·4	191
gram	24	4·6	89
groundnut	60	11·4	104
cotton	28	5·3	150

*Relative Yield Index represents Panchmahals district yields expressed a percentage of the corresponding all-India average yields for 1968-69 & 1970-71.

Rainfall Zone IX—E_4 (A_1 C_3) E_4

4.60 The district and taluks included in the zone and their cropping patterns are :

Cropping Pattern	*Taluk*	*District*
Gn_1	Manavadar	Junagadh
	Keshod	,,
	Malia	,,
	Talala	,,
	Mendarda	,,
$Gn_2\ W_4/C_4/Jr_4$	Vanthali	,,
	Junagadh	,,
$Gn_3\ Jk_4\ F_4$	Mangrol	,,
$Jk_3\ C_4\ Gn_4\ Pd_4/Fr_4$	Ghorasi	Surat
$C_3\ Jk_4$	Olpad	,,
C_5	Amod	Bharuch
	Jambusar	,,
$C_2\ Jr_4$	Vagra	,,
	Bharuch	,,
$C_2\ Jk_4$	Hansat	,,
$C_3\ Jr_4\ Jk_4$	Ankleshwar	,,

4.61 The zone comprises of 16 taluks and covers an area of 9,844 sq km. Area of Jambusar taluk is 1,097 but the remaining taluks are less than 1,000 sq km. About a third of the taluks are less than 500 sq km in area. All the taluks of Bharuch and Surat are at sea level. Except in Junagadh and Mendarda taluks, the heights vary between sea level and 150 masl. The maximum elevation in Junagadh and Mendarda is 1117 and 480 masl respectively. Surat and Broach districts have mainly medium or deep black soils with coastal alluvium. In Junagadh, medium black or red and black with coastal alluvium soils prevail. The population density in Talala and Vagra is about 75 per sq km. Excepting Bharuch and Ghorasi which have density exceeding 300 the population density in the rest varies between 100 and 300.

4.62 Forest area is also not high. Follow and permanent pasture lands are mostly negligible. This leaves the net sown area between 60 to 80 per cent of reporting and excepting Talala which has only 25 per cent net sown area.

4.63 Mangrol has 32 per cent irrigated area followed by Ghorasi, Amod and Bharuch with 20 to 30, Junagarh between 10 and 20 and Olpad 15 per cent. Irrigation in the remaining zone is negligible.

4.64 It is a region of high rainfall with annual averages ranging between 75 and 100 cm. July is the month of maximum rainfall of 30 cm and with August accounts for about 60 per cent of the annual total. Rainfall in June, August and September ranges between 10 to 12 cm pm.

4.65 The total cropped area is 616 thousand ha which is 6 per cent of the gross cropped area in the State. Groundnut and cotton are the principal crops, each grown on 32 per cent of the gross cropped area of the zone. Cotton is the main crop in the taluks of Surat and Bharuch districts, and groundnut in Junagadh. Seven out of eight taluks of Junagadh have 62 to 74 per cent area under groundnut. Six taluks of Bharuch district have 50 to 70 per cent area under cotton. Jowar is the dominant crop of Ghorasi and Olpad with about 40 and 30 per cent of gross cropped area respectively.

4.66 The yields of principal crops are given in Table 18. Yields of groundnut in Junagadh are the highest in the State. Cotton yield in Surat is lower than that in Bharuch though well above all-India average. Jowar yields are very high in Surat but low in Bharuch and Junagadh.

4.67 Male cattle are dominant with an average of 25 per cent of the livestock population in the zone, but in Vagra these constitute 40 per cent. Female and young stock of cattle are 11 to 18 per cent in the taluks of Junagadh and in Hansot and Ankleshwar. Female buffaloes in the zone constitute 12 to 19 per cent of total livestock and young stock of buffaloes 10 to 15 per cent in a number of taluks. Sheep account for 12 to 16 per cent in only 3 taluks of Junagadh, but less than 10 per cent in other parts of the zone. Goats are dominant in Surat and Bharuch areas and to a lesser extent in other parts of the zone too. The livestock patterns are :

Taluk	*Pattern*
Manavdar, Vanthali	$Cm_4\ Bf_4\ S_4\ Cf_4/Cy_4$
Keshod, Mendarda, Junagadh, Mangrol, Malia, Talala	$Cm_4\ Cf_4\ Cy_4\ G_4/S_4/Bf_4$
Vagra, Jambusar, Amod	$Cm_3\ G_4\ Bf_4$
Olpad, Hansot, Ankleshwar	$Cm_4\ G_4\ Cy_4\ Cf_4/Bf_4$
Bharuch	$G_3\ Cm_4\ Bf_4$
Ghorasi	$G_4\ Bf_4\ Cm_4$

TABLE 18

Relative Yield Index of Principal Crops in Zone IX

	Junagadh	Surat	Bharuch
groundnut	137	—	—
jowar (kharif)	53	118	68
wheat	143	—	—
cotton	—	115	154
jowar (rabi)	—	169	150

NOTE : Relative Yield Index represents district yields expressed as percentage of the corresponding all-India average yield for 1968-69 & 1970-71.

Rainfall Zone X—$E_4\ (A_1\ B_1\ C_1\ E_1)\ E_4$

4.68 The districts and taluks included in the zone and their cropping patterns are :

Cropping Pattern	*Taluk*	*District*
$B_3\ Pd_4\ Mt_5\ To_4/W_4$	Mehmedabad	Kheda
	Nadiad (Kheda)	,,
$Gn_4\ B_4\ C\ Pd_4$	Kapadvanj	,,
$M_2\ Pd_4$	Vijayanagar	Sabarkantha
$M_4\ C_4\ Pd_4\ Gn_4\ B_4/W_4$	Bhiloda	,,
	Meghraj	,,
$Gn_3\ B_4\ C_4$	Prantiji	,,
	Himatnagar	,,
$Gn_4\ B_4\ M_4\ C_4$	Modasa	,,
	Malpura	,,
	Bayed	,,
$C_4\ Gn_4\ M_4\ B_5$	Idar	,,
$B_4\ Jk_4\ Pd_4\ F_4/W_4$	Ahmedabad	Ahmedabad
	Daskroi	,,

4.69 The area of the zone is 9,558 sq km, the areas of individual taluks varying from 287 sq km to 1,135 sq km. Kheda and Ahmedabad taluks of zone are practically at sea level. Sabarkantha area is more elevated. Vijayanagar and Bhiloda have heights ranging between 300 and 450 masl. Elsewhere the elevations are between 100 and 300 masl. The soils are mainly medium or deep black, grey brown and coastal alluvium. Except for 15 to 30 per cent in some of the taluks, irrigated area is not significant in the zone. Taluks of Kheda district have population density exceeding 270 per sq km. The density of Nadiad is 568, Ahmedabad 6,289, Daskroi 283 and in the rest of the zone it varies from 100 to 220.

4.70 Fallow lands are negligible. There are no permanent pastures. Land not available for cultivation accounts for 11 to 12 per cent of the total reporting area in Nadiad, Kapadvanj and Mehmedabad taluks. Net sown area is between 60 and 80 per cent. A few taluks have net sown area between 20 and 40 per cent only.

4.71 The annual rainfall varies between 70 and 90 cm. July receives the maximum rainfall of 30 to 35 cm followed by August with 22 and September 13 cm respectively. June rainfall averages 8-10 cm. June to September rainfall accounts for 95 per cent and July and August together 65 to 70 per cent of annual.

4.72 The cropped area of the zone is 714 thousand ha which represents 7 per cent of the gross cropped area of the State. The principal crops are bajra, groundnut, cotton and maize accounting 20, 18, 17 & 10 per cent of the cropped area respectively. Area under paddy is 9 per cent and under wheat 7 per cent. Bajra occupies 10 to 35 per cent area. In Kheda district, bajra and paddy are the major crops with Kapadvanj having 21-25 per cent area under groundnut and cotton. Nadiad has 11 per cent area under tobacco. Taluks of Sabarkantha district have mainly bajra, cotton, groundnut and paddy. The zone has 8 cropping patterns; 2 are with maize, 2 with bajra, 3 with groundnut and one with cotton.

4.73 The yields of principal crops are given in Table 19. The yield of rice in Sabarkantha district is one-third of all-India average. Yields of bajra and cotton are very high. Groundnut in Sabarkantha is near all-India but moderately low in Kheda. Maize yields are about all-India level. Jowar (kharif) yields are much better than most of the districts of the State though much lower than all-India average.

4.74 Male cattle are uniformally high ranging between 20 and 26 per cent. Population of goats is between 33 and 37 per cent. Sheep number is mostly negligible. Female buffaloes in two taluks constitute 31 per cent of the total livestock population. The main patterns are :

Disctrict	*Pattern*
Vijayanagar, Bhiloda, Meghraj	$G_3\ Cm_4\ Cf_4$
Kapadvanj, Prantiz, Himatnagar	$Bf_3\ By_4\ Cm_4$
Ahmedabad, Daskroi, Mehmedabad	$Bf_4\ By_4\ Cm_4\ G_4$
Nadiad, Modasa, Malpura	
Bayad	$Cm_4\ Bf_4\ By_4\ G_4$

TABLE 19

Relative Yield Index of Principal Crops in Zone X

Crop	Sabarkantha	Kheda
bajra	185	155
rice	34	109
jowar (kharif)	68	68
maize	109	89
groundnut	99	78
cotton	152	160

NOTE : Relative yields Index represents district yield as percentage of the corresponding all-India average yields for 1968-69 & 1970-71.

Rainfall Zone XI— $E_4\ (A_1\ B_1\ C_2)\ E_4$

4.75 The districts and taluks included in the zone and their cropping patterns are :

Cropping Pattern	*Taluk*	*District*
$Pd_3\ W_4\ B_4\ C_4$	Matar	Kheda
$B_3\ Pd_4\ Mt_5\ To_4/W_4$	Barsad	,,
	Petlad	,,
$C_4\ B_4\ Pd_4\ M_4/To_4$	Thasra	,,
	Balasinor	,,
$To_3\ B_4\ Pd_4$	Anand	,,
$M_3\ Pd_4\ Gn_4/Mt_4/G_4$	Santrampur	Panchmahals
	Godhra	,,
	Devgarhbaria	,,
$Gn_4\ Pd_4\ B_4\ C_4$	Katol	,,
$C_4\ Pd_4\ Mt_4\ Gn_4/Jr_4$	Halol	,,
$Jr_4\ Pd_4\ C_4\ Mt_4$	Sagbara	Bharuch
$C_2\ Jr_4$	Jhagadia	,,
$C_3\ Jr_4\ Jk_4$	Valia	,,
$C_3\ Jr_4\ Pd_4$	Nandod	,,
	(Rajpipla)	,,
$C_4\ Pd_4\ Jk_4\ Mt_4$	Dediapada	,,
$Jk_3\ C_4\ Gn_4\ Pd_4/Fr_4$	Mangrol	Surat
C_1	Sinor	Baroda
	Dabhoi	,,
	Karjan	,,
$C_2\ Jr_4$	Vaghodia	,,
$C_3\ Jr_5\ Pd_4\ To_4/Mt_4/(B_4\ To_4)$	Vadodara	,,
	Padra	,,

4.76 The zone comprises of 23 taluks in the district of Kheda (6), Panchmahals (5), Bharuch (5), Surat (1) and Baroda (6) and covers an area of 15,950 sq km, which represents 8 per cent of the total geographical area of the State. Five taluks exceed 1,000 sq km in area. Sinor in Baroda district has the lowest area of 293 sq km and Santrampur the highest area of 1,360 sq km. Elevations in taluks of Kheda range between sea level to 100 masl. In Panchmahals, the heights vary between 50 and 300 masl although the maximum elevation in Halal is 829 masl. The height variations are larger in Bharuch from 50 to 800 masl and in Baroda from sea level to 100 masl. The soils of the zone are deep or medium black with coastal alluvium. Grey brown soils are also observed in Kheda. In a few taluks like Halol, Devgarbharia and Santrampur irrigated area is more but on the whole it is negligible. The taluks of Kheda district have population density of 200 to 500 per sq km except Anand and Petlad taluks which have densities of 590 and 541 respectively. In taluks of Panchmahals district, the density is around 180, the highest of 297 being in Kalol. The taluks of Bharuch district have density of 131 to 157 except Dediapada which has the lowest density of 166.

4.77 The net sown area is very high in taluks of Baroda district, being 75 to 86 per cent of the geographical area. Permanent pastures are negligible. The net sown area in Panchmahals district is from 49 to 69 per cent. In Kheda district the net sown area is high.

4.78 The annual rainfall of the zone varies between 80 and 120 cm. Most of the area of the zone receives 80 to 100 cm. July is the month of maximum rainfall of 30 cm. July and August together account for more than 60 per cent of annual precipitation.

4.79 The cropped area of the zone is 1051 thousand ha representing about 10 per cent of the cropped area of the State. The principal crops are cotton, paddy and bajra, occupying 27, 15 and 10 per cent of the cropped area. Area under jowar (rabi), maize and small millets is 6-7 and under jowar (kharif) groundnut and tobacco 5 per cent each. Cotton has the highest area and is the dominant crop in Bharuch and Baroda districts. Three of Baroda taluks have nearly 70 to 75 per cent area under cotton. The zonal average of 27 per cent does not adequately represent its distribution in the zone. Maize crop is important only in taluks of Panchmahals district and jowar (rabi) in the taluks of Bharuch and Baroda districts. Small millets appear only in a few taluks. Tobacco is grown largely in Kheda and Baroda districts. The largest area of more than 22 thousand hectares is in Anand. Paddy is grown all over the zone though the area exceeds 20 per cent in a few taluks only.

4.80 The relative yield index values of crops are given in Table 20. The yields of crops in general are either close to all-India average or a little higher, except those of rice, tur and jowar. Rice yields are not high as the rainfall amount and distribution are not even near the minimum considered necessary for growing this crop. Although rainfall is adequate for growing jowar crop, yields of kharif jowar are low.

4.81 The livestock population is dominated by male cattle though female buffaloes are important and significant in a number of taluks. The livestock patterns are :

Taluka	*Pattern*
Dediapada, Nandod, Mangrol, Sinor, Dabhoi, Kalol, Devgarh Baria, Godhra, Sagbara	$Cm_3\ G_4\ Cf_4$
Halol, Waghadia, Thasta, Balasinor	$Cm_4\ Bf_4\ By_4\ G_4$
Valia	$Cm_4\ G_4\ Cy_4$
Jaghodia, Santrampur	$Cm_4\ G_4\ Cf_4/Cy_4$
Boarsad, Petlad, Anand	$Bf_3\ By_4\ Cm_4$
Vadodara, Padra	$Bf_4\ Cm_4\ G_4$
Matar	$Bf_4\ By_4\ Cm_4\ G_4$
Karjan	$S_3\ Cm_4\ G_4$

TABLE 20

Relative Yield Index of Principal Crops in Zone XI

Crop	District				State average
	Bharuch	Baroda	Kheda	Panchmahals	
rice	62	51	109	73	79
jowar (kharif)	68	68	68	68	43
jowar (rabi)	150	206	168	168	172
bajra	157	159	155	140	147
maize	97	89	89	93	97
small millets	178	191	234	191	188
wheat	113	112	124	113	116
tur	66	74	70	72	67
groundnut	83	87	78	104	96
cotton	154	192	160	150	144
tobacco	—	115	153	190	148

NOTE : Relative Yield Index represents district yield expressed as percentage of the corresponding all-India average yield for 1968-69 to 1970-71.

Rainfall Zone XII—E_4 (A_2 B_1 C_1) E_4

4.82 The districts and taluks included in the zone and their cropping patterns are :

Cropping pattern	*Taluk*	*District*
C_2 Jr_4	Sankheda	Baroda
	Tilakwada	,,
C_3 Jr_3 Pd_4	Nasavadi	,,
C_4 Mt_4 Pd_4 Jr_4/(Gn_4 M_4)	Chhota-Udaipur	
C_4 Pd_4 Mt_4 Gn_4/Jr_4	Jambughoda	Panchmahals
Pd_4 Jk_4 Gn_4 C_4 Pu_4/Mt_4	Songadh	Surat
	Vyara	,,
	Palsana	,,
Jk_4 Pd_4 C_4 Gn_4/Fr_4/Pu_4	Mahuva	,,
	Valod	,,
Jk_3 C_4 Gn_4 Pd_4/Fr_4	Mandvi	,,
Jr_2 Gn_4 W_4	Nizar	,,
Jr_4 Pd_4 Mt_4 C_4	Uchhal	,,
C_4 Jk_4 Pd_4 Fr_4/Pu_4	Kamrej	,,
	Bardoli	,,

4.83 The area of the zone is 7661 sq km. Only Chhota Udaipur has an area of 1,379 sq km. Nine of the taluks of this zone have areas less than 500 and Valod has the lowest of 202 sq km. Elevation varies between 100 and 450 masl with coastal areas at sea level. The soils of the zone are mainly deep black or coastal alluvium. Palsana taluk has 47 per cent area under irrigation followed by Kamrej and Bardoli ranging from 20 to 24 per cent. Ninety per cent of net sown area of Jambughora is irrigated. Irrigation in the rest of the zone is negligible. The population density exceeds 130 per sq km. Only Bardoli taluk has the highest density of 317 in the zone.

4.84 A large part of the area is barren and uncultivable land. Fallow land, pastures, etc., are negligible. The net sown area varies from 40 to 90 per cent. Net area sown accounts for more than 70 per cent of the reporting area in seven taluks, 39 to 49 in four taluks and 55 to 60 per cent in the rest of the taluks.

4.85 It is a zone with good rainfall, the averages ranging between 100 and 160 cm. In Surat district, the averages are 140 to 160 cm. July is the month of maximum rainfall with more than 50 cm in Surat and 35 to 40 cm in Baroda. August rainfall is 30 cm and in September 20-25 cm. Rainfall in June is 18 cm in Surat and 12 cm in Baroda. July and August account for over 60 per cent of annual precipitation.

4.86 The cropped area of the zone is 450 thousand ha representing more than 4 per cent of the gross cropped area of the State. Cotton occupies the largest area followed by paddy, jowar (kharif), jowar (rabi), groundnut, small millets and gram with 26, 15, 12, 10, 8, 6 and 4 per cent respectively. In eleven of the fifteen taluks in this zone, paddy is grown on more than 10 per cent area. Valod, Mahuva, Vyara, Sangod and Bardoli taluks occupy 20 to 23 per cent of their respective cropped areas under paddy. The area under jowar is significant in all taluks of Surat district and in Mandvi, Mahuva and Valod taluks it covers 30 per cent. Jowar covers more than 10 per cent area in taluks of Baroda district. Nijhar taluk alone accounts for 52 per cent. Small millets occupy 18 per cent area in three taluks. Cotton is a major crop of the zone. Groundnut area in a number of taluks is about 10 per cent.

4.87 The relative yield index values of crops of Surat and Baroda districts are given in Table 21. Yield of rice in Surat is equal to the all-India average but that in Baroda only half of all-India. Kharif jowar yield is low in Baroda. Yield of jowar in Surat is well above all-India. The yields of small millets are very high. Yield of gram in Surat is of all-India level.

4.88 Male cattle and goats dominate in the zone. Male cattle account for about 30 per cent of the total livestock of various taluks. Sheep do not occur in significant number. Only in one taluk Kamrej, their percentage is 14. Female and young stock of cattle are nearly the same in number and range between 10 and 20 per cent. The patterns are :

Taluk	*Pattern*
Nijhar, Uchhal, Songadh, Vyara, Mandvi	Cm_3 G_4 Cf_4
Kamrej, Palsana	G_4 Bf_4 Cm_4 Cy_4/S_4
Sankheda, Tilakwada, Nasavadi, Chhota Udaipur, Jambughoda	Cm_3 G_4 Cf_4
Barodoli	Cm_4 G_4 Cy_4 Cf_4

TABLE 21

Relative Yield Index of Principal Crops in Zone XII

Crop	Surat	Baroda
rice	93	51
jowar (kharif)	118	68
jowar (rabi)	169	206
small millets	187	191
gram	90	—
groundnut	117	87

NOTE : Relative Yield Index represents district yield expressed as percentage of the corresponding all-India average yield fo 1968-69 tor 1970-71.

Rainfall Zone XIII— $E_4 (A_2 B_2) E_4$

4.89 The districts and taluks included in the zone and their cropping patterns are :

Cropping Pattern	*Taluk*	*District*
Pd_3 Pu_4 Jk_4/R_4	Gandevi, Chikhli	Valsad
Pd_3 Jk_4 R_4	Bansda	,,
Jk_4 C_4 Pd_4 Pu_4	Navsari	

4.90 The area of the zone is 2,195 sq km. In Bansda taluk, the maximum elevation is 675 masl but the rest of the zone is at sea level. Deep or medium black soils predominate in the zone. Irrigated area is 40 per cent in Gandevi and about 20 per cent in Navsari. In other parts, irrigated area is negligible. The population density of the zone exceeds 300 per sq km. Gandevi has a density of 561 and Bansda of 201.

4.91 The taluks of Valsad district have 26 per cent area under forests and 6 per cent under barren and uncultivable land. Fallow lands are negligible; permanent pastures account for about 10 per cent in Navsari and Gandevi taluks. The net sown area varies between 50 per cent in Bansda and 85 per cent in Chikhli.

4.92 The zone receives an average rainfall of 150 cm annually in 60 to 75 rainy days. July is the month of maximum rainfall. In June and September rainfall is between 20 and 30 cm and in October it is 4 to 5 cm. This is an area where all the 4 months June to September receive more than 20 cm pm and two of them receive more than 30 cm pm.

4.93 The total cropped area of this zone is 110 thousand ha. The main crops are paddy, jowar kharif, cotton, other pulses occupying 35, 17, 13 and 10 per cent of the area respectively. Gram and tur together account for 5 per cent. Areas under ragi and wheat are 4 and 2 per cent respectively. The zone has three patterns two with paddy and one with kharif jowar in Navsari. In fact the difference in area between cotton and jowar is negligible and paddy area is also of the same order as jowar. Paddy is a dominant crop with an average of more than 30 per cent and jowar is significant though not of the same order. Cotton is predominant in Navsari and ragi is significant in Bansda taluk.

4.94 The relative yield index values of crops of the zone are given in Table 22. The yield of rice is the same as the all-India average. Yield of jowar (kharif) is 68 per cent of all-India value. The yields of ragi and wheat are about normal and that of cotton very good. The yield of jowar (kharif) is rather low being 68 per cent of all-India average.

4.95 Goats and male cattle dominate in this zone. Female buffaloes account for 21 per cent in Navsari and 18 per cent in Gandevi. The livestock patterns are :

Taluk	*Pattern*
Navsari, Gandevi	G_4 Bf_4 Cm_4 Cy_4/S_4
Chikhli	Cm_4 G_4 Cy_4 Cf_4
Bansda	Cm_4 Cf_4 G_4/Cy_4

TABLE 22

Relative Yield Index of Principal Crops in Zone XIII

	Area '000 ha	Percent of gross Cropped area per cent	RYI*
paddy	84	26·3	99
jowar (kharif)	17	5·2	68
ragi	17	5·4	92
wheat	2·8	0·9	112
cotton	17	5·3	144
other pulses	20	6·0	86

*RYI represents Valsad district yields expressed as percentage of the corresponding all-India average yields for 1968-69 to 1970-71.

Rainfall Zone XIV— $E_4 (A_3 B_1) E_4$

4.96 The district and taluks included in the zone and their cropping pattern are given below :

Cropping pattern	*Taluk*	*District*
Pd_1	Umbergaon	Valsad
Pd_2 Fr_4	Pardi	,,
	Valsad	,,
Pd_3 Jk_4 Pu_4/R_4	Dharmpur	,,
R_3 Mt_4 O_4 Pd_4	Ahwa	Dangs

4.97 The area of the zone is 4,632 sq km. Ahwa taluk of Dangs district and Dharmpur taluk of Valsad district have each areas of about 1,680 sq km. Areas of the remaining three taluks of the zone are between 360 and 510 sq km. Dharampur and Dangs are elevated areas. In Dangs the highest elevation is between 300 and 1,000 masl but in Dharampur maximum elevation is 682 masl. The remaining three taluks are practically at sea level. The soils are deep or medium black and irrigated area is negligible. Dangs taluk has the lowest population density of 56 per sq km. while that of Dharampur is double of this value. Population density in the remaining part of the zone ranges between 320 and 440.

4.98 Dangs has 70 per cent of the area under forests leaving the net sown area of only 20 per cent. Dharampur has also good proportions of forest area and the net sown area in this taluk is 33 per cent. In the three remaining taluks of the zone, the net sown area ranges from 70 to 85 per cent. Follow land, pastures, etc., are negligible.

4.99 Dharampur taluk receives the heaviest rainfall of 240 cm annually followed by Dangs receiving 200 cm rainfall. July is the month of maxmium rainfall. July and August together account for 60 to 70 per cent of the annual total. July average rainfall is 70-75 cm. June and August get between 30 and 40 cm and the average for September is 25 cm.

4.100 Ragi predominates in Dangs and occupies nearly one-third of the cropped area. Dharampur also has to some extent ragi like Dangs but paddy predominates in the rest of the zone. In Umbergaon, paddy occupies 84 per cent of the cropped area. The cropped area of the zone is 145 thousand ha, which represents less than 2 per cent of the gross cropped area of the State. Two-thirds of the cropped area occurs in Dangs and Dharampur. The averages for the zone are paddy 37, ragi 19, small millets 11, gram 6, tur 5 and other pulses 5 and other oilseeds 6 per cent. The cropping patterns centre round paddy and ragi. Only in Dangs, the pattern inculdes also small millets. Elsewhere paddy predominates.

4.101 Paddy yield in general is practically the same as all-India average but in Dangs district, the yield of paddy is only 61 per cent of the all-India value. Ragi yield in Dangs is 92 per cent of all-India.

4.102 Cattle and goats predominate in theis zone. The two patterns are :

Taluk	*Pattern*
Dangs Dharampur Umbergaon Pardi	$Cm_4\ Cf_4\ G_4/Cy_4$
Valsad (Bulsar)	$Cm_4G_4\ Cy_4\ Cf_4$

5 GENERAL OBSERVATIONS FOR FUTURE CROPPING PATTERNS

General

5.1 In the foregoing sections we have dealt with in detail the rainfall, cropping and livestock patterns which emerge from the existing information. We have also categorised the rainfall patterns into zones and discussed how the other patterns feature in those zones. Among other information that on soils, which ought to play an important role in determining cropping patterns, is lacking in such details as are wanted for this analysis. Data on orography and population density have featured in this analysis but their exact role on cropping and livestock patterns coud not be brought out owing to lack of detailed information. We are, however, convinced that studies and analysis indicated in the preceding sections are important for the guidance they may give in deciding cropping and livestock patterns *vis-a-vis* rainfall patterns. The greater the accuracy of the primary information, and the more detailed such information is, the more useful the data would be in drawing up the most efficient cropping and livestock patterns in an area or a zone. With this purpose in view the folowing procedures are suggested :—

(i) Delineation of rainfall zones;

(ii) Identification of the existing cropping patterns;

(iii) Assessment of area needed for each crop and its ideal distribution;

(iv) Comparison of (iii) with (ii) in order to determine possible changes; and

(v) Consideration of other related factors like soil, irrigation facilities, density of population livestock patterns and then arriving at the future cropping patterns.

5.2 The methods of delineating rainfall patterns or zones and cropping patterns have been fully discussed in Section 2. For the purpose of locating suitable areas for a crop, soil and topography of the land are important factors. The approximate area to be put under each crop will be decided by the demand for it not only at a State level but at the national level, either for internal consumption or for the purpose of export. The Departments responsible for crop planning of a State should, therfore, be cognisant of the demand for a crop, so that production efforts are not rendered futile because of lack of demand and marketing. We have already discussed the part each of the factors mentioned in item (v) of para 5.1 is likely to play in deciding cropping patterns. For this purpose not only detailed data but also knowledge about the correlation between these factors and crop performance would be necessary. Knowledge gained, through long experience, by farmers would also be most helpful.

5.3 It may be mentioned that the rainfall intervals which form the basis of identifying rainfall patterns are subject to minor modifications. Thus, the condition that 30 cm of rainfall for three consecutive months is good for paddy may not be rigorously adhered to. If the soil is favourable with a high water retention capacity or, what is more important, water management is efficient with an eye to economise water use, rainfall lower than 30 cm for three months may sustain a good crop of paddy.

5.4 The choice of a cropping pattern is not decided by the farmer only on technical grounds. He is also guided by the profitability of the crops or requirements for his household consumption. Farmers may not be inclined to accept a crop unless the necessary inputs and infrastructure are assured. Of all the inputs water is the most important as is made evident by the spread of groundnut in the country, sugarcane in Gujarat, maize and cotton in Karnataka and recently of wheat in West Bengal. These are excellent instances of the manner of introduction of new crops in the cropping patterns of a State or a region.

Some observations Pertaining to Gujarat State

5.5 Yield levels of many crops in the State are well above all-India averages. There is scope for increasing the same further. Some specific aspects as mentioned below need looking into.

5.6 The State takes both kharif and rabi jowar. Rabi jowar is mainly confined to the southern districts and Saurashtra. The yields of jowar are generally poor. Crop is reported to be taken for dual purpose of getting grain as well as fodder in some areas. The places where it is grown solely for grain, there is no reason why yields should be low. Soil moisture is not a limiting factor where grain crop is taken. Possibilities of increasing yields by increasing plant population per hectare needs special attention.

5.7 Groundnut is a very important crop in the State accounting for 25 per cent of the all-India area under it. About 80 per cent of the groundnut area in the State is confined to Saurashtra region. The crop is mostly taken rainfed. There are years when its performance is satisfactory giving about 10 quintals of yield per hectare, but in other years, the yields are very low. During the period 1967-68 to 1971-72, the variation in yields has ranged between 4.5 and 10.44 quintals per ha. The rainfall in the months of July and August in the Saurashtra area is either A1 C1 or B1 C1 or C2 categories. In some of the other parts of the State, it is even of A1 B1 category. There is likelihood of the crop suffering from excess moisture and weed growth in the initial stages of crop growth period wherever A or B type of rainfall occurs in other months, rainfall cannot be said to be adequate, particularly in the years of low rainfall. It is, therefore, suggested that the problem be studied in great detail with a view to stabilising groundnut production. Possibilities of replacing some area with sunflower may also be examined.

5.8 Parts of Banaskantha and Mehsana districts experience the same desert conditions as are prevalent in western Rajasthan. However, the State Government is trying to provide irrigation facilities on an increasing scale in the affected parts. Accordingly, cropping patterns applicable to irrigated areas will have to be developed even for these districts.

APPENDIX 1

Talukwise Land Use (1968-69) and Population Statistics

GUJARAT

(Area in thousand hectares)

District/taluk	Population 1971		Forests	Nac	Cw	pp&gl	Mtc & g	Fallow lands	Net area sown
	Total	Per sq km.				thousand hectares			
	Rainfall Zone—I		..	..	..		*Rainfall Pattern—$B_4(C_1D_1E_2)E_4$*		
Kutch									
Mundra	57079	64	—(—)	2(2)	6(7)	1(1)	—(—)	13(15)	44(49)
Anjar	143133	109	—(—)	1(1)	10(8)	9(7)	—(—)	8(6)	78(59)
Abdasa	74165	31	—(—)	1(1)	46(19)	11(5)	—(—)	10(42)	3(1)
Rapar	99173	33	—(—)	3(1)	35(12)	—(—)	2(1)	92(31)	108(36)
Bhachau	79016	40	—(—)	5(2)	13(7)	2(1)	2(1)	47(23)	94(47)
Lakhpat	21960	11	—(—)	1(1)	16(8)	—(—)	—(—)	44(22)	1(ng)
Bhuj	167443	37	—(—)	2(1)	20(4)	57(13)	—(—)	12(3)	78(17)
Mandvi	115546	81	—(—)	5(4)	10(7)	6(4)	—(—)	39(29)	37(26)
Kutch									
Nakhatrana	92254	47	—(—)	2(1)	9(4)	—(—)	—(—)	15(7)	47(23)
Jamnagar									
Okhamandal	76808	107	—(—)	9(13)	13(19)	5(6)..	—(—)	12(17)	24(33)
Kalyanpur	91595	65	—(—)	2(1)	3(2)	10(7)	—(—)	5(3)	83(59)
	Rainfall Zone—II		..		..		*Rainfall Pattern—$E_4(C_1D_3)E_4$*		
Amreli									
Liliya	48003	122	—	1(3)	—	4(10)	—	1(3)	32(81)
Lathi	82694	131	—	neg(neg)	2(3)	6(9)	—	neg(neg)	52(82)
Khambha	35711	88	—	1(2)	2(5)	4(10)	—	neg(neg)	25(61)
Dhari	99935	91	—	2(2)	2(2)	6(5)	—	12(11)	74(68)
Amreli	140496	169	—	3(4)	1(1)	4(5)	—	3(4)	71(85)
Babra	72383	91	—	3(4)	1(1)	4(5)	—	1(1)	58(73)
Bhavnagar									
Savarkundla	164388	142	—	4(2)	2(1)	30(18)	—	7(4)	122(74)
Gariadhar	69662								
	Rainfall Zone—III		..		..		*Rainfall Pattern—$E_4(C_2D_1E_1)E_4$*		
Mahesana									
Chanasma	174284	197	—(—)	4(5)	2(2)	8(9)	—(—)	1(1)	72(81)
Harej	55161	136	—(—)	Neg(1)	1(3)	4(10)	—(—)	3(7)	31(75)
Saini	97858	65	—(—)	2(1)	30(20)	11(7)	—(—)	2(1)	95(63)
Jamnagar									
Jadiya	75140	86	—(—)	2(2)	2(2)	6(7)	—(—)	6(7)	51(58)
Banaskantha									
Vav	97262	57	—(—)	2(1)	4(2)	6(4)	—(—)	32(19)	98(58)
Tharad	109058	80	—(—)	3(2)	2(2)	13(10)	—(—)	4(3)	108(80)
Deodar	107179	106	—(—)	7(7)	1(1)	2(2)	—(—)	1(1)	86(84)
Santhalpur	55652	41	—(—)	2(1)	16(12)	4(3)	—(—)	37(28)	57(42)
Dhanera	108432	91	—(—)	1(1)	1(1)	11(9)	—(—)	6(5)	86(73)
Radhampur	63572	107	—(—)	2(3)	1(2)	1(2)	—(—)	12(21)	43(72)
Kankrej	116468	142	—(—)	1(1)	1(1)	2(2)	—(—)	—(—)	70(85)

— = nil or negligible
Nac = not available for cultivation
Cw = culturable waste
Pp&gl = permanent pastures and other grazing lands
Mtc&g = miscellaneous tree crops and groves not included in net area sown
NOTE : Figures in brackets represent percentages to total reporting area

APPENDIX 1 (*Contd.*)

District/taluk	Population 1971		Forests	Nac	Cw	Pp&gl	Mtc&g	Fallow lands	Net area sown
	Total	Per sq km	thousand hectares						
	Rainfall Zone — IV							*Rainfall Pattern—E_4 (C_2D_2)E_4*	
Surendranagar									
Sayla	50545	52	—(—)	2(3)	1(1)	4(4)	—(—)	7(7)	55(57)
Dasada	113765	70	—(—)	1(neg)	4(3)	12(7)	—(—)	8(3)	108(66)
Limbdi	152761	89	—(—)	10(6)	14(8)	neg(neg)	—(—)	9(5)	119(69)
Wadhwan	160758	202	—(—)	1(2)	0·4(1)	6(7)	—(—)	3(4)	62(78)
Muli	57414	61	—(—)	3(3)	3(3)	5(5)	—(—)	3(3)	55(59)
Bhavnagar									
Umrala	54219	133	—(—)	1(3)	1(1)	5(13)	—(—)	10(25)	21(52)
Gadhada	90367	101	—(—)	4(4)	6(6)	6(6)	—(—)	6(7)	62(69)
Sehor	98412	137	—(—)	4(6)	6(8)	5(7)	—(—)	—(—)	48(66)
Vallabhipur	48416	82	—(—)	4(1)	2(3)	4(7)	—(—)	7(11)	40(67)
	Rainfall Zone—V							*Rainfall Pettern—$E_4(B_1C_1E_2)$ E_4*	
Jamnagar									
Bhanvad	76124	104	—(—)	3(4)	1(2)	5(7)	—(—)	1(2)	43(59)
Jamjodhpur	97236	90	—(—)	4(4)	1(1)	11(10)	2(2)	1(1)	59(55)
Kalavod	101604	82	—(—)	2(1)	neg(neg)	10(8)	—(—)	—(—)	80(65)
Khambhaliya	115448	95	—(—)	4(3)	2(2)	8(6)	—	5(4)	73(60)
Lalpur	72142	67	—(—)	2(2)	1(1)	7(7)	—(—)	15(14)	59(55)
Jamnagar	360133	294	—(—)	1(1)	3(3)	7(6)	neg(neg)	11(7)	68(5)
Dhrol	45118	79	—(—)	1(2)	0·4(1)	5(8)	—(—)	neg(neg)	40(67)
Junagadh									
Una	169256	108	—(—)	4(2)	—(—)	(15)9	—(—)	2(1)	65(41)
Bhesan	49175	112	—(—)	1(2)	—(—)	6(14)	—(—)	—(—)	34(79)
Visavadar	90276	100	—(—)	3(3)	1(1)	11(13)	—(—)	0·4(4)	51(57)
Patan Veraval	191308	278	—(—)	7(10)	0·4(1)	8(12)	—(—)	2(3)	40(67)
Junagadh									
Ranavav	60589	103	—(—)	1(2)	1(1)	8(14)	—(—)	2(3)	24(42)
Kutiyana	67981	120	—(—)	2(4)	—(—)	13(23)	—(—)	4(7)	34(60)
Porbandar	225524	198	—(—)	3(3)	2(2)	18(16)	4(4)	13(11)	58(51)
Amreli									
Kodinar	105759	203	—(—)	5(11)	3(7)	1(2)	—(—)	1(3)	35(67)
Rajula	101093	119	(——)	1(1)	1(1)	7(8)	—(—)	5(7)	61(72)
Jafrabad	42039	119	—(—)	1(4)	neg (neg)	3(10)	—(—)	—(—)	26(73)
Kunkavav-Vadia	120617	145	—(—)	4(4)	neg (neg)	7(9)	—(—)	—(—)	70(84)
Rajkot									
Dhoraji	119357	247	—(—)	1(2)	neg (neg)	7(15)	—(—)	1(2)	38(79)
Jetpur	126544	186	—(—)	1(2)	—(—)	6(9)	—(—)	—(—)	51(75)
Jam-Kandorna	52659	93	—(—)	1(2)	1(2)	5(10)	—(—)	—(—)	42(74)
Gondal	176463	148	—(—)	9(8)	neg (neg)	18(15)	—(—)	1(1)	82(68)
Lodhika	29966	80	—(—)	3(9)	—(—)	3 (8)	—(—)	1(2)	23(62)
Paddhari	51229	79	—(—)	7(10)	0·4(1)	6(9)	—(—)	1(2)	43(67)
Kotnasngani	40502	91	—(—)	1(2)	1(2)	7(15)	—(—)	3(6)	31(68)
Upleta	137793	174	—(—)	2(3)	4(1)	11(14)	—(—)	neg (neg)	57(72)
Rajkot	392084	371	—(—)	8(6)	2(2)	8(7)	—(—)	3(3)	65(55)
Jasdan	131792	99	—(—)	11(9)	4(3)	4(3)	—(—)	1(1)	87(66)
Morvi	203521	120	—(—)	5(3)	neg (neg)	11(6)	—(—)	neg (neg)	1227(3)
Wankaner	103391	93	—(—)	3(3)	6(5)	17(15)	—(—)	4(4)	56(50)
Maliya	58771	76	—(—)	6(7)	—(—)	2(3)	—(—)	(2)	50(65)

APPENDIX 1 (*Contd.*)

District/taluk	Population 1971		Forests	Nac	Cw	Pp&gl	Mtc&g	Fallow lands	Net are sown
	Total	Per sq km			thousand hactares				
	Rainfall zone—V—(Contd.)		..	..	..	*Rainfall Pattern—$E_4(B_1C_1E_2)E_4$*			
Surendranagar									
Ghotila	77082	73	—(—)	neg (neg)	4(3)	5(5)	—(—)	2(1)	57(45)
Lakhtor	50905	69	—(—)	3(4)	0·4(1)	3(4)	—(—)	—(—)	60(81)
Halvad	71485	139	—(—)	1(1)	4(3)	7(10)	—(—)	3(2)	81(66)
Dhrangadhra	110739	81	—(—)	3(2)	neg (neg)	6(4)	—	9(6)	88(65)
Mahesana									
Patan	254117	243	—(—)	8(8)	1(1)	11(10)	neg (neg)	1(1)	84(80)
Sidhpur	234868	350	—(—)	1(2)	2(4)	8(13)	—(—)	neg (neg)	52(78)
Kheralu	205821	216	—(—)	4(4)	4(4)	8(9)	2(2)	1(2)	69(73)
Mahesana	246212	311	—(—)	4(5)	1(2)	5(6)	—(—)	1(2)	67(84)
Banaskatha									
Vadgam	112630	199	—(—)	2(3)	1(2)	1(2)	4(6)	5(9)	41(73)
Ahmadabad									
Viramgam	237832	139	—(—)	1 (1)	5 (3)	2 (1)	—(—)	4 (2)	140 (82)
	Rainfall Zone—VI		..	..	..	*Rainfall Pattern—$E_4(B_1C_2E_1)E_4$*			
Bahavnagar									
Botad	93244	124	—	2(3)	3(4)	4(6)	—	8(10)	53(70)
Palitana	105874	144	—	3(4)	1(1)	7(9)	—(—)	14(20)	40(55)
Bhavnagar	298745	204	—	7(5)	9(6)	1(1)	—(—)	—(—)	36(25)
Ghogha	48976	112	—	2(6)	1(1)	3(8)	—(—)	2(1)	30(69)
Talaja	136906	157	—	1(1)	3(5)	10(11)	—(—)	3(3)	64(74)
Mahuva	196075	161	—	1(1)	2(2)	18(15)	—(—)	4(3)	90(73)
Mahesana									
Vijapur	308216	328	—	3(2)	0·4(1)	11(12)	neg(neg)	neg(neg)	78(83)
Visnagar	160729	329	—	3(5)	0·4(1)	3(7)	0·2(1)	neg (neg)	42(86)
Kalol	172533	354	—	4(8)	0·5(1)	2(4)	neg (neg)	2(4)	41(83)
Kadi	182674	220	—	6(7)	3(3)	4(4)	1(1)	1(2)	69(83)
Ahmadabad									
Dehgam	150738	243	—	0·1(1)	1(1)	3(4)	—(—)	1(1)	50(80)
Dhandduka	181166	67	—	2(1)	9(3)	3(1)	—(—)	23(9)	163(60)
Dholka	226577	131	—	1(1)	5(3)	2(1)	—(—)	5(3)	126(73)
Sanand	113787	142	—	1(1)	3(3)	1(1)	—(—)	4(6)	62(78)
Vadodara									
Jambugam	137756	172	—	1(1)	4(5)	5(7)	1(1)	neg (neg)	50(63)
Gandhinagar									
Gandhinagar	200642	309	—	5(8)	2(3)	6(9)	—(—)	2(3)	51(77)
Kheda									
Gambay	221139	185	—	9(1)	4(3)	3(3)	—(—)	3(3)	68(57)
	Rainfall Zone—VII		..	..	..	*Rainfall Pattern—$E_4(B_2E_2)E_4$*			
Banaskantha									
Deesa	195443	132	—	2(1)	1(1)	14(9)	—	2(1)	115(77)
Palanpur	228944	219	—	4(4)	1(1)	18(17)	neg (neg)	3(3)	77(73)
Danta	70743	83	—	2(2)	neg(neg)	1(1)	—	—	18(21)
Sabarkantha									
Khedbrahma	98559	117	—	1(1)	7(8)	2(2)	—	6(7)	36(42)
	Rainfall Zone—VIII		..	..	..	*Rainfall Pettern—$E_4(B_6C_2)E_4$*			
Panchmahals									
Shehera	113259	195	—	0·3(1)	3(4)	6(11)	—(—)	3(5)	29(50)
Limkheda	163016	153	—	1(1)	1(1)	8(7)	—(—)	4(4)	43(40)
Dohad	235928	270	—	8(9)	4(4)	7(8)	—(—)	1(1)	48(55)
Jhalad	158860	199	—	2(3)	4(5)	2(3)	—(—)	4(5)	48(60)
Lunavada	186251	197	—	1(1)	2(2)	3(3)	—(—)	2(3)	57(60)
Vadodora									
Savli	161022	203	—	(2)3	1(1)	7(9)	—(—)	1(1)	62(78)

APPENDIX 1 (*Contd.*)

District/taluk	Population 1971		Forests	Nac	Cw	Pp&gl	Mtc&g	Fallow lands	Net area sown
	Total	per sqkm			thousand hactares		lands		
	Rainfall Zone—IX		..		..	..	*Rainfall Pattern—$E_4(A_1C_3)E_4$*		
Junagadh									
Manavadar	108284	183	—	3(5)	neg (neg)	7(11)	—	1(2)	47(61)
Keshod	105273	187	—	4(7)	neg (neg)	10(18)	—	—	39(10)
Malia	87017	161	—	1(3)	neg (neg)	13(24)	1(2)	1(1)	33(61)
Talala	72743	76	—	3(3)	5(5)	12(13)	—	2(2)	24(25)
Mendakda	46948	129	—	2(5)	—(—)	2(6)	—(—)	—(—)	24(65)
Vanthali	81326	207	—	4(9)	neg (neg)	2(6)	—(—)	3(7)	31(78)
Janagudh	193709	286	—	4(6)	neg (neg)	2(4)	—(—)	3(5)	37(55)
Mangrol	107268	189	—	2(3)	4(1)	7(12)	—(—)	1(2)	41(73)
Surat									
Ghorasi	645827	1108	—	1(2)	neg(neg)	3(6)	—(—)	2(4)	36(63)
Olpad	98407	143	—	2(3)	neg(neg)	6(9)	neg (neg)	1(1)	45(65)
Bharuch									
Amod	68664	148	—	3(6)	neg(neg)	1(2)	—(—)	0·3(1)	38(82)
Jambnsar	140355	128	—	4(3)	3(2)	5(4)	—(—)	1(1)	67(61)
Vagra	65037	74	—	1(1)	1(1)	2(2)	—(—)	1(1)	52(59)
Bharuch	223537	336	—	7(10)	1(2)	3(5)	—(—)	1(2)	53(79)
Hansat	45231	113	—	(2)5	0·2(1)	2(5)	—(—)	1(2)	24(61)
Ankleshwar	97297	235	—	(2)5	0·3(1)	1(3)	—(—)	1(3)	34(81)
	Rainfall Zone—X		..	..	..		*Rainfall Pattern—$E_4(A_1B_1C_1E_1)E_4$*		
Kheda									
Mehmedabad	173152	348	—(—)	6(12)	neg (neg)	3(6)	—(—)	1(2)	40(80)
Nadiad	376627	568	—(—)	7(11)	0·4(1)	2(3)	—(—)	2(3)	54(82)
Kapadranj	269764	274	—(—)	11(12)	1(1)	6(6)	—(—)	1(1)	78(79)
Sabarkantha									
Vijaynagar	43378	95	—(—)	0·4(1)	1(2)	1(1)	—(—)	1(2)	10(22)
Bhiloda	114190	158	—(—)	3(4)	0·4(1)	1(2)	—(—)	14(20)	35(48)
Meghraj	69095	127	—(—)	2(4)	2(4)	neg(neg)	—(—)	—(—)	33(60)
Prantij .	182949	222	—(—)	1(1)	1(1)	6(7)	—(—)	1(2)	62(74)
Himatnagar	143649	186	—(—)	1(1)	1(2)	6(8)	—(—)	4(5)	51(66)
Modasa	153409	177	—(—)	1(1)	3(3)	6(7)	—(—)	3(3)	59(68)
Malpur	50527	137	—(—)	0·4(1)	2(6)	2(6)	—(—)	1(3)	22(59)
Bagad	137517	187	—(—)	1(1)	1(1)	1(2)	—(—)	0·4(1)	61(83)
Idar	194364	171	—(—)	2(2)	1(1)	7(6)	—(—)	4(3)	84(74)
Panchmahals									
Ahmadabad	1803085	6289	—(—)	1(5)	1(4)	0·1(1)	—(—)	3(10)	11(38)
Darkroi	197622	283	—(—)	1(1)	2(3)	6(8)	—(—)	3(5)	52(74)
	Rainfall Zone—XI		..	..	..		*Rainfall Pattern—$E_4(A_1B_1C_2)E_4$*		
Kheda									
Matar	132084	229	—	8(14)	0·4(1)	3(5)	—	1(2)	45(78)
Barsad	301054	494	—	7(12)	1(1)	2(3)	—	1(2)	50(82)
Petlad	256693	541	—	1(1)	1(1)	1(2)	—	1(2)	42(88)
Thasra	190285	288	—	9(14)	neg (neg)	4(7)	—	neg (neg)	52(79)
Balsinor	131513	238	—	8(14)	1(1)	2(2)	—	0·3(1)	35(64)
Anand	399096	590	—	9(13)	0·3(1)	2(3)	—	1(1)	56(82)
Panchmahals									
Santrampur	247300	182	—	8(6)	4(3)	neg (neg)	—	6(9)	69(50)
Godhra	269357	264	—	0·4(1)	3(3)	6(6)	—	5(5)	61(60)
Devgad Baria	219373	192	—	8(7)	4(3)	5(6)	—	8(7)	55(49)
Kalol	118273	297	—	2(6)	1(4)	1(2)	—(—)	1(2)	27(69)
Halol	115674	223	—	1(1)	3(6)	5(9)	—(—)	1(2)	31(60)

APPENDIX 1 (*Concld.*)

District/taluk	Population 1971		Forests	Nac	Cw	Pp & gl	Mtc & g	Fallow lands	Net area sown
	Total	Per sq km			thousand hectares				
	Rainfall Zone—XI (Contd.)		..	..	..	*Rainfall Pattern—E_4 (A_1 B_1 C_2) E_4*			
Bharuch									
Sagbara	52576	131	—	1(3)	neg (neg)	1(3)	—(—)	11(27)	26(66)
Jhagadia	120,000	148	—	2(3)	1(1)	4(5)	—(—)	1(2)	49(61)
Valia	80927	157	—	4(8)	neg (neg)	3(6)	neg (—)	0·4(1)	41(79)
Nandod	148294	131	—	14(13)	1(1)	3(3)	—(—)	neg (neg)	51(45)
Dediapada	67683	66	—	3(3)	2(2)	2(2)	—(—)	neg (neg)	24(24)
Surat									
Mangrol	128904	165	—	1(1)	1(1)	9(12)	0·3(1)	0·4(1)	61(78)
Vadodara									
Sinor	56656	194	—	2(6)	neg (neg)	3(10)	—(—)	—(—)	24(82)
Dabhoi	145160	229	—	2(3)	0·4(1)	7(11)	—(—)	neg (neg)	53(83)
Kargan	114782	191	—	0·4(1)	neg (neg)	6(10)	—(—)	0·4(1)	52(86)
Vaghodia	89269	158	—	3(4)	neg (neg)	8(15)	—(—)	0·3(1)	42(75)
Vadodara	665306	993	—	8(11)	1(1)	4(5)	—(—)	2(4)	51(75)
Padra	171308	320	—	5(10)	1(2)	1(3)	—(—)	neg (neg)	41(76)
	Rainfall Zone—XII		..	..	..	*Rainfall Pattern—E_4 (A_2 B_1 C_1) E_4*			
Vadodara									
Sankheda	133676	185	—	3(5)	neg (neg)	6(8)	1(1)	neg (neg)	56(77)
Tilakwada	43542	178	—	2(8)	1(3)	2(7)	—(—)	1(2)	19(78)
Nasvadi	72661	136	—	2(4)	4(1)	4(7)	0·3(1)	neg (neg)	41(56)
Chhota Udaipur	188927	137	—	9(6)	6(5)	17(12)	—(—)	3(2)	63(56)
Panch Mahals									
Jambughoda	21513	147	—	—(—)	2(10)	1(6)	—(—)	1(7)	5(39)
Surat									
Songadh	135095	158	—	1(1)	neg (neg)	5(6)	1(1)	2(2)	42(49)
Vgara	153536	189	—	2(3)	—(—)	2(2)	2(3)	1(1)	49(60)
Palsana	53170	265	—	1(6)	—(—)	1(5)	—(—)	0·2(1)	18(88)
Mahuva	82049	232	—	1(3)	1(2)	1(4)	2(1)	0·2(1)	28(78)
Valod	51999	257	—	·4(2)	neg (neg)	1(6)	—(—)	0·2(1)	18(87)
Mandvi	119168	163	—	1(2)	1(2)	0·3(1)	—	2(3)	44(61)
Nizar	71932	180	—	1(2)	—(—)	3(8)	—	1 (neg)	31(78)
Uchhal	44940	139	—	1(2)	0·4(1)	1(3)	—	2(6)	13(42)
Kemrej	81777	216	—	1(1)	—(—)	1(2)	—(—)	1(1)	32(43)
Bardoli	120120	317	—	0·3(1)	—(—)	3(7)	—(—)	1(3)	32(83)
	Rainfall Zone—XIII		..	..	..	..	*Rainfall Pattern—$E_4(A_2B_2)E$*		
Valsad									
Gardevi	159483	561	—	1(3)	—(—)	3(11)	—	1(3)	17(63)
Chikhli	176089	306	—	(neg)	—(—)	3(5)	—	1(2)	49(85)
Bansda	120169	201	—	1(2)	—(—)	2(3)	—	1(2)	30(50)
Navsari	276425	376	—	1(2)	neg (neg)	5(8)	—	1(1)	47(64)
	Rainfall Zone—XIV		..	..	..	..	*Rainfall Pattern—E_4 (A_3 B_1)F_4*		
Valsad									
Umbergaon	116866	323	—	0·4(1)	0·2(1)	2(6)	—(—)	1(2)	25(69)
Pardi	162465	380	—	1(2)	—(—)	1(2)	—(—)	1(3)	36(84)
Valsad	223084	438	—	2(4)	0.3(1)	1(3)	—(—)	1(2)	38(75)
Dharampur	193711	117	—	1(1)	14(8)	2(1)	—(—)	2(1)	55(33)
The Dangs (Ahwa)	94185	56	100(58)	13(7)	3(2)	0·4(2)	—(—)	7(4)	51(29)

APPENDIX 2

Talukwise Livestock Population—1966

GUJARAT

(thousands)

District/taluk	Cattle			Buffaloes			Sheep	Goats	Horses & ponies	Mules	Donkeys	Camels	Pigs	Total livestock
	Male	Female	Young stock	Male	Female	Young stock								
	Rainfall Zone—I ..						..		..	*Rainfall Pattern—$E_4(C_1B_1E_2)E_4$*				
Kutch														
Mundra	6 (10)	11 (16)	11 (16)	— (—)	2 (3)	2 (3)	18 (27)	16 (24)	— (—)	— (—)	1 (1)	— (—)	— (—)	68
Anjar	10 (11)	14 (15)	15 (17)	— (—)	2 (2)	1 (1)	26 (28)	23 (26)	— (—)	— (—)	— (—)	— (—)	— (—)	90
Abdasa	12 (8)	26 (18)	26 (18)	— (—)	4 (2)	3 (2)	28 (20)	44 (30)	— (—)	— (—)	1 (1)	1 (1)	— (—)	145
Rapar	16 (11)	16 (12)	12 (9)	— (—)	7 (5)	4 (3)	45 (32)	36 (27)	— (—)	— (—)	1 (1)	1 (1)	— (—)	138
Bhachan	10 (11)	12 (13)	9 (10)	— (—)	5 (6)	3 (4)	24 (26)	26 (28)	— (—)	— (—)	1 (1)	1 (1)	— (—)	92
Lakhpat	4 (7)	16 (26)	10 (16)	— (—)	3 (5)	2 (3)	4 (7)	21 (34)	— (—)	— (—)	— (—)	1 (2)	— (—)	61
Bhuj	13 (7)	31 (18)	23 (13)	— (—)	12 (7)	6 (4)	34 (20)	49 (28)	1 (1)	— (—)	1 (1)	2 (1)	— (—)	172
Mandvi	10 (9)	18 (16)	19 (17)	— (—)	3 (2)	2 (2)	27 (25)	31 (28)	— (—)	— (—)	1 (1)	— (—)	— (—)	110
Nakhotara	10 (9)	17 (16)	15 (14)	— (—)	7 (7)	5 (5)	10 (9)	40 (38)	— (—)	— (—)	1 (1)	1 (1)	— (—)	106
Jamnagar														
Okhamandal	9 (18)	8 (16)	8 (16)	— (—)	3 (6)	2 (4)	13 (25)	6 (12)	1 (2)	— (—)	— (—)	— (—)	— (—)	51
Kalyanpur	21 (26)	10 (13)	9 (12)	— (—)	8 (10)	4 (5)	18 (22)	8 (10)	1 (1)	— (—)	1 (1)	— (—)	— (—)	80
	Rainfall Zone—II ..						..		..	*Rainfall Pattern—$E_4(C_1D_3)E_4$*				
Amreli														
Liliya	6 (17)	4 (10)	5 (12)	— (—)	3 (8)	3 (8)	10 (28)	6 (17)	— (—)	— (—)	— (—)	— (—)	— (—)	37
Lathi	11 (20)	7 (12)	7 (12)	— (—)	4 (7)	4 (7)	12 (23)	10 (17)	0·4 (1)	— (—)	0·4 (1)	— (—)	— (—)	56
Khambha	6 (20)	5 (17)	5 (17)	— (—)	4 (13)	2 (8)	2 (8)	5 (16)	0·2 (1)	— (—)	— (—)	— (—)	— (—)	29
Dhari	16 (23)	10 (14)	11 (16)	— (—)	7 (10)	5 (7)	7 (10)	12 (18)	1 (1)	— (—)	1 (1)	— (—)	— (—)	70
Amreli	15 (20)	8 (10)	9 (11)	— (—)	7 (9)	5 (7)	18 (23)	15 (19)	1 (1)	— (—)	— (—)	— (—)	— (—)	78
Balra	12 (18)	9 (13)	10 (14)	— (—)	4 (6)	3 (4)	18 (26)	12 (18)	1 (1)	— (—)	— (—)	— (—)	— (—)	69
Bhavnagar														
Savarkundli Gariadhar	29 (18)	18 (11)	21 (13)	— (—)	16 (10)	12 (7)	36 (22)	27 (17)	1 (1)	— (—)	1 (1)	— (—)	— (—)	161
	Rainfall Zone—III ..						..		..	*Rainfall Pattern—$E_4(C_2D_1E_1)E_4$*				
Mehsana														
Chanasma	21 (22)	9 (9)	6 (6)	— (—)	20 (20)	17 (17)	4 (4)	17 (17)	1 (1)	3 (3)	— (—)	1 (1)	— (—)	98
Harij	8 (22)	6 (16)	3 (9)	— (—)	5 (14)	3 (9)	2 (5)	8 (22)	0·4 (1)	1 (2)	— (—)	— (—)	— (—)	37
Sami	20 (23)	16 (19)	12 (14)	— (—)	9 (10)	7 (8)	5 (6)	15 (18)	1 (1)	1 (1)	— (—)	0·1 (0·2)	— (—)	86
Jamnagar														
Jodia	11 (18)	5 (8)	5 (8)	— (—)	4 (7)	4 (7)	21 (34)	10 (16)	0·3 (1)	1 (1)	— (—)	— (—)	— (—)	62

neg.=negligible

NOTE.—Figures in brackets represent percentages to total livestock

APPENDIX 2 (*Contd.*)

District/taluk	Cattle			Buffaloes			Sheep	Goats	Horses & ponies	Mules	Donkeys	Camels	Pigs	Total live-stock
	Male	Female	Young stock	Male	Female	Young stock								
	Rainfall Zone-III (Contd.) ..						..		..	*Rainfall Pattern—$E_4(C_2D_1E_1)E_4$*				
Banaskantha														
Vav	23 (11)	24 (12)	17 (8)	— (—)	14 (7)	8 (4)	77 (38)	37 (18)	1 (—)	1 (1)	— (—)	2 (1)	— (—)	204
Jharad	23 (14)	20 (12)	18 (11)	0·4 (0·3)	12 (7)	10 (6)	44 (27)	35 (21)	1 (1)	0·4 (0·3)	— (—)	2 (1)	— (—)	166
Deodar	20 (17)	17 (14)	16 (14)	— (—)	12 (10)	9 (7)	15 (13)	26 (22)	1 (1)	— (—)	1 (1)	1 (1)	— (—)	118
Santhalpur	10 (14)	12 (16)	10 (13)	— (—)	5 (7)	4 (5)	18 (24)	15 (20)	1 (1)	— (—)	— (—)	— (—)	— (—)	75
Dhanera	23 (12)	21 (11)	19 (10)	0·2 (0·1)	14 (7)	11 (6)	50 (27)	47 (25)	0·3 (0·2)	— (—)	1 (0·3)	3 (2)	— (—)	189
Radhanpur	11 (19)	9 (16)	7 (12)	— (—)	6 (11)	4 (7)	8 (4)	11 (19)	1 (1)	— (—)	0·4 (1)	— (—)	— (—)	57
Kankrej	21 (20)	16 (16)	14 (13)	— (—)	10 (9)	8 (8)	12 (12)	18 (18)	1 (1)	— (—)	1 (1)	1 (1)	— (—)	102
	Rainfall Zone—IV ..						..		..	*Rainfall Pattern—$E_4(C_2D_2)E_4$*				
Surendranagar														
Sayla	10 (22)	7 (15)	6 (13)	— (—)	4 (9)	3 (6)	7 (15)	8 (17)	1 (2)	— (—)	0·3 (1)	— (—)	— (—)	47
Dasada	16 (21)	13 (17)	8 (11)	— (—)	6 (8)	5 (7)	8 (11)	17 (23)	1 (1)	— (—)	1 (1)	— (—)	— (—)	75
Limbdi	20 (28)	11 (15)	9 (12)	— (—)	8 (11)	7 (10)	2 (3)	13 (18)	1 (1)	— (—)	1 (1)	0·4 (1)	— (—)	72
Wadhwan	10 (20)	6 (12)	5 (10)	— (—)	4 (8)	4 (8)	5 (10)	14 (29)	0·4 (—)	— (—)	1 (2)	— (—)	— (—)	48
Muli	10 (19)	8 (15)	6 (11)	— (—)	5 (9)	4 (7)	12 (22)	8 (15)	1 (1)	— (—)	0·4 (1)	— (—)	— (—)	53
Bhavnagar														
Umrala	6 (14)	5 (12)	5 (12)	— (—)	3 (7)	3 (7)	12 (28)	8 (19)	0·2 (1)	— (—)	— (—)	— (—)	— (—)	43
Gadhada	13 (18)	10 (13)	10 (14)	— (—)	4 (6)	4 (5)	19 (25)	14 (18)	1 (1)	— (—)	0·4 (1)	— (—)	— (—)	74
Sehor	10 (15)	9 (13)	9 (12)	— (—)	7 (9)	5 (7)	19 (27)	12 (17)	0·3 (0·4)	— (—)	0·3 (0·4)	— (—)	— (—)	72
Vallabhipur	7 (19)	5 (15)	6 (15)	— (—)	4 (10)	3 (9)	6 (17)	5 (15)	0·2 (1)	— (—)	0·2 (1)	— (—)	— (—)	37
	Rainfall Zone—V ..						..		..	*Rainfall Patterns—$E_4(B_1C_1E_2)E_4$*				
Jamnagar														
Bhanwad	13 (23)	6 (11)	6 (11)	— (—)	6 (11)	4 (7)	9 (16)	11 (19)	1 (1)	— (—)	1 (1)	— (—)	— (—)	57
Jamjodhpur	15 (20)	11 (14)	10 (14)	— (—)	9 (12)	5 (7)	11 (15)	12 (16)	1 (1)	— (—)	0·4 (1)	— (—)	— (—)	74
Klavad	19 (18)	13 (12)	12 (12)	— (—)	6 (5)	4 (4)	33 (32)	16 (15)	1 (1)	— (—)	1 (1)	— (—)	— (—)	105
Khambhaliya	19 (24)	9 (11)	10 (12)	— (—)	8 (10)	6 (7)	18 (22)	9 (11)	1 (1)	— (—)	2 (2)	— (—)	— (—)	80
Lalpur	13 (19)	7 (10)	8 (11)	— (—)	6 (9)	5 (7)	21 (29)	9 (13)	0·4 (1)	— (—)	1 (1)	— (—)	— (—)	70
Jamnagar	18 (15)	14 (12)	13 (10)	— (—)	8 (6)	5 (4)	41 (33)	23 (18)	1 (1)	— (—)	2 (1)	— (—)	— (—)	124
Dhrol	7 (18)	5 (12)	4 (10)	— (—)	2 (5)	1 (2)	13 (32)	7 (18)	0·3 (1)	— (—)	1 (2)	— (—)	— (—)	40
Junagarh														
Una	29 (27)	21 (19)	23 (21)	— (—)	14 (13)	7 (6)	5 (5)	8 (7)	2 (2)	— (—)	— (—)	— (—)	— (—)	109
Bhesan	8 (25)	4 (13)	4 (13)	— (—)	3 (9)	2 (6)	5 (7)	5 (7)	0·2 (1)	— (—)	0·3 (1)	— (—)	— (—)	32

APPENDIX 2 (*Contd.*)

District/taluk	Cattle			Buffaloes			Sheep	Goats	Horses & ponies	Mules	Donkeys	Camels	Pigs	Total livestock
	Male	Female	Young stock	Male	Female	Young stock								
	Rainfall Zone—V (Contd.) ..						..		..	*Rainfall Pattern—$E_4(B_1C_1E_2)E_4$*				
Junagadh (Contd.)														
Visavadai	15 (23)	10 (16)	9 (15)	0·2 (0·3)	8 (13)	5 (9)	7 (11)	7 (11)	0·1 (1)	— (—)	0·3 (1)	— (—)	— (—)	62
Patan Veraval	26 (31)	16 (19)	18 (21)	— (—)	7 (8)	4 (5)	5 (6)	6 (8)	1 (1)	— (—)	1 (1)	— (—)	— (—)	84
Ranavav	7 (18)	4 (11)	5 (14)	— (—)	5 (14)	4 (11)	5 (14)	6 (16)	0·3 (1)	— (—)	0·2 (1)	— (—)	— (—)	37
Kutiyana	9 (20)	6 (13)	5 (12)	— (—)	8 (18)	5 (11)	5 (11)	6 (13)	1 (2)	— (—)	— (—)	— (—)	— (—)	45
Porbandar	23 (22)	12 (12)	14 (13)	— (—)	13 (12)	7 (7)	25 (24)	8 (8)	1 (1)	— (—)	0·4 (1)	— (—)	— (—)	104
Amreli														
Kodinar	17 (30)	12 (21)	13 (23)	— (—)	4 (7)	3 (5)	3 (5)	5 (8)	1 (1)	— (—)	— (—)	— (—)	— (—)	59
Rajula	13 (20)	10 (14)	9 (13)	— (—)	8 (12)	5 (7)	13 (20)	7 (11)	1 (2)	— (—)	0·3 (1)	— (—)	— (—)	66
Jafrabad	7 (25)	5 (17)	6 (21)	— (—)	2 (7)	1 (4)	5 (17)	2 (7)	0·4 (2)	— (—)	— (—)	— (—)	— (—)	29
Kunkarvavadia	17 (23)	7 (10)	9 (13)	— (—)	7 (9)	5 (8)	13 (18)	12 (17)	1 (1)	— (—)	1 (1)	— (—)	— (—)	72
Rajkot														
Dhoraji	8 (21)	6 (16)	6 (16)	— (—)	4 (11)	3 (8)	4 (11)	6 (16)	— (—)	— (—)	0·2 (1)	— (—)	— (—)	37
Jetpur	13 (22)	8 (13)	8 (13)	— (—)	5 (8)	3 (5)	14 (24)	8 (13)	0·3 (1)	— (—)	0·3 (1)	— (—)	— (—)	59
Jamkondarna	9 (21)	6 (14)	6 (14)	— (—)	3 (7)	2 (4)	11 (26)	6 (14)	— (—)	— (—)	— (—)	— (—)	— (—)	44
Gondal	21 (20)	15 (14)	14 (13)	— (—)	7 (7)	5 (5)	27 (25)	16 (15)	— (—)	— (—)	1 (1)	— (—)	— (—)	105
Lodhika	6 (18)	3 (9)	4 (12)	— (—)	2 (6)	1 (3)	12 (36)	5 (15)	— (—)	— (—)	0·2 (1)	— (—)	— (—)	33
Paddhari	9 (18)	6 (12)	6 (12)	— (—)	3 (5)	2 (4)	15 (30)	8 (16)	0·3 (1)	— (—)	1 (2)	— (—)	— (—)	49
Kotda Sangani	7 (15)	5 (11)	5 (11)	— (—)	2 (4)	2 (4)	18 (38)	7 (15)	0·3 (1)	— (—)	0·3 (1)	— (—)	— (—)	47
Upleta	11 (18)	10 (18)	9 (15)	— (—)	7 (11)	4 (6)	8 (14)	9 (16)	0·4 (1)	— (—)	0·3 (1)	— (—)	— (—)	59
Rajkot	19 (15)	17 (13)	15 (12)	— (—)	8 (6)	5 (4)	38 (29)	21 (16)	1 (1)	— (—)	5 (4)	— (—)	— (—)	130
Jasdav	22 (18)	17 (14)	19 (16)	— (—)	8 (6)	5 (4)	27 (22)	22 (18)	1 (1)	— (—)	1 (1)	— (—)	— (—)	122
Morvi	21 (16)	12 (9)	12 (9)	— (—)	10 (7)	8 (6)	46 (34)	22 (17)	1 (1)	— (—)	1 (1)	— (—)	— (—)	132
Wankaner	16 (14)	10 (9)	12 (10)	— (—)	9 (8)	7 (6)	35 (31)	24 (21)	— (—)	— (—)	1 (1)	— (—)	— (—)	114
Maliya	8 (18)	3 (7)	3 (7)	— (—)	4 (9)	4 (9)	13 (30)	8 (18)	0·3 (1)	— (—)	0·4 (1)	— (—)	— (—)	44
Surendranagar														
Ghotila	15 (19)	3 (16)	11 (14)	— (—)	9 (11)	5 (6)	13 (16)	13 (16)	1 (1)	— (—)	0·3 (1)	— (—)	— (—)	80
Lakhtar	8 (23)	4 (13)	4 (13)	— (—)	3 9)	2 (7)	5 (16)	5 (16)	1 (2)	— (—)	0·3 (1)	— (—)	— (—)	33
Halvad	13 (19)	8 (12)	7 (10)	— (—)	4 (6)	3 (4)	22 (33)	10 (15)	0·4 (—)	— (—)	— (—)	— (—)	— (—)	67
Dhrangadhra	12 (16)	9 (12)	7 (9)	— (—)	5 (7)	4 (5)	18 (24)	19 (25)	1 (1)	— (—)	0·4 (1)	— (—)	— (—)	75
Mehsana														
Patan	24 (18)	16 (12)	12 (9)	— (—)	24 (18)	17 (13)	9 (7)	26 (19)	1 (1)	— (—)	3 (2)	1 (1)	— (—)	135
Ridhpur	18 (20)	7 (8)	4 (4)	— (—)	27 (30)	13 (15)	5 (5)	12 (14)	— (—)	— (—)	2 (3)	1 (1)	— (—)	89
Kheralu	25 (24)	7 (7)	6 (6)	— (—)	27 (27)	17 (17)	4 (4)	14 (13)	— (—)	— (—)	2 (1)	1 (1)	— (—)	102
Mehsana	18 (18)	8 (8)	5 (5)	— (—)	27 (28)	20 (20)	6 (6)	12 (12)	— (—)	— (—)	2 (2)	1 (1)	— (—)	98

APPENDIX 2 (*Contd.*)

District/taluk	Cattle			Buffaloes			Sheep	Go. ats	Hor- ses & ponies	Mu- les	Don- keys	Ca- mels	Pigs	Total live- stock
	Male	Female	Young stock	Male	Fe- male	Young stock								
	Rainfall Zone—V (Contd.) ..						..		.. *Rainfall Pattern—$E_4(B_1C_1E_2)$*					E_4
Banaskantha														
Vadgam	17 (21)	5 (6)	5 (6)	— (—)	22 (27)	10 (12)	5 (6)	16 (20)	— (—)	— (—)	2 (2)	— (—)	— (—)	82
Ahmedabad														
Viramgaon	27 (24)	21 (18)	13 (11)	— (—)	17 (15)	14 (12)	2 (2)	17 (15)	1 (1)	— (—)	2 (2)	— (—)	— (—)	114
	Rainfall Zone—VI ..				..			..	*Rainfall Patterns—E_4 (B_1 C_2 E_1)E_4*					
Bhavnagar														
Botad	10 (20)	7 (13)	7 (13)	— (—)	4 (8)	4 (8)	8 (15)	11 (21)	0·4 (1)	— (—)	0·3 (1)	—	—	52
Palitana	12 (15)	10 (12)	10 (12)	— (—)	7 (9)	5 (6)	23 (28)	14 (17)	1 (1)	— (—)	— (—)	— (—)	— (—)	82
Bhavnagar	10 (17)	8 (13)	7 (12)	— (—)	9 (15)	5 (8)	9 (15)	11 (18)	0·3 (1)	— (—)	0·4 (1)	— (—)	— (—)	60
Ghogha	7 (16)	5 (11)	4 (10)	— (—)	6 (14)	3 (7)	10 (22)	8 (19)	0·3 (1)	— (—)	— (—)	— (—)	— (—)	43
Talaja	18 (18)	6 (6)	7 (7)	0·2 (0·2)	16 (16)	9 (19)	33 (33)	9 (9)	1 (1)	—	(1)	—	—	100
Mohua	23 (18)	14 (11)	16 (13)	— (—)	15 (12)	12 (9)	31 (24)	14 (11)	2 (1)	—	1 (1)	— (—)	— (—)	128
Mehsana														
Vijapur	21 (17)	6 (5)	5 (4)	— (—)	42 (34)	27 (22)	5 (4)	13 (10)	— (—)	— (—)	3 (3)	2 (1)	—	125
Viinagar	13 (21)	4 (6)	2 (4)	— (—)	20 (31)	12 (19)	4 (6)	7 (11)	— (—)	— (—)	1 (1)	1 (1)	—	65
Kalol	11 (17)	4 (7)	4 (6)	— (—)	19 (29)	14 (22)	2 (3)	9 (13)	— (—)	— (—)	1 (2)	1 (1)	—	65
Kadi	16 (9)	8 (10)	5 (6)	— (—)	21 (25)	16 (19)	2 (3)	12 (15)	0·2 (0·3)	— (—)	2 (2)	1 (1)	—	83
Ahmedabad														
Dehgam	16 (20)	4 (5)	6 (8)	— (—)	18 (23)	19 (24)	3 (4)	11 (14)	— (—)	— (—)	1 (1)	1 (1)	— (—)	80
Dhandhuka	25 (24)	21 (21)	16 (16)	0·1 (0·1)	10 (10)	7 (7)	4 (4)	16 (16)	1 (1)	— (—)	1 (1)	— (—)	— (—)	101
Dolka	24 (26)	17 (18)	13 (15)	— (—)	16 (17)	11 (12)	1 (1)	9 (9)	1 (1)	— (—)	1 (1)	— (—)	— (—)	93
Sanane	15 (27)	9 (16)	6 (11)	— (—)	9 (16)	7 (12)	2 (3)	7 (13)	0·3 (1)	— (—)	1 (1)	— (—)	— (—)	56
Vadodara														
Jambnagar	29 (33)	9 (11)	10 (11)	— (—)	8 (9)	6 (7)	— (—)	26 (29)	— (—)	— (—)	— (—)	— (—)	— (—)	88
Gandhinagar														
Gandhinagar	14 (17)	6 (7)	5 (6)	— (—)	22 (27)	19 (23)	2 (3)	12 (15)	— (—)	— (—)	1 (1)	1 (1)	—	82
Kheda														
Gombay	16 (23)	7 (9)	8 (10)	— (—)	19 (27)	12 (17)	3 (4)	7 (9)	0·4 (1)	— (—)	— (—)	— (—)	— (—)	72
	Rainfall Zone—VII ..						..		.. *Rainfall Pattern—$E_4(B_2E_3)E_4$*					
Banaskantha														
Deesa	31 (17)	29 (16)	23 (13)	1 (1)	17 (9)	11 (6)	23 (13)	39 (21)	1 (1)	— (—)	2 (1)	4 (2)	— (—)	181
Palampur	30 (18)	20 (12)	15 (9)	— (—)	24 (14)	15 (9)	11 (7)	48 (28)	— (—)	— (—)	3 (2)	2 (1)	— (—)	168
Danta	17 (17)	15 (15)	12 (12)	— (—)	9 (9)	6 (6)	2 (2)	40 (39)	— (—)	— (—)	— (—)	— (—)	— (—)	101
Sabarkantha														
Khedbrahma	23 (19)	21 (18)	15 (12)	— (—)	9 (7)	7 (6)	5 (4)	41 (34)	— (—)	— (—)	— (—)	— (—)	— (—)	121

APPENDIX 2 (*Contd.*)

District/taluk	Cattle			Buffaloes			Sheep	Goats	Horses & ponies	Mules	Donkeys	Camels	Pigs	Total live-stock
	Male	Female	Young stock	Male	Female	Young stock								
	Rainfall Zone—VIII ..				..				..	*Rainfall Pattern—$E_4(B_2\ C_2)E_4$*				
Panchmahals														
Shehera	28	14	10	0·2	11	8	—	19	—	—	0·1	0·1	—	90
	(31)	(16)	(11)	(0·3)	(12)	(9)	(—)	(21)	(—)	(—)	(0·1)	(0·1)	(—)	
Limkheda	50	21	17	—	14	10	—	55	—	—	—	—	—	167
	(30)	(13)	(10)	(—)	(8)	(6)	(—)	(33)	(—)	(—)	(—)	(—)	(—)	
Dohad	56	34	25	—	12	8	5	40	—	—	1	—	—	181
	(31)	(19)	(14)	(—)	(7)	(4)	(3)	(22)	(—)	(—)	(—)	(—)	(—)	
Zalod	44	27	37	—	14	9	2	39	—	—	—	—	—	172
	(26)	(6)	(21)	(—)	(8)	(5)	(1)	(23)	(—)	(—)	(—)	(—)	(—)	
Lunavada	42	15	10	—	27	22	—	26	—	—	1	—	—	144
	(29)	(11)	(7)	(—)	(19)	(15)	(—)	(18)	(—)	(—)	(1)	(—)	(—)	
Vadodara														
Savli	19	4	6	—	13	12	1	9	—	—	1	—	—	65
	(30)	(6)	(10)	(—)	(20)	(19)	(1)	(13)	(—)	(—)	(1)	(—)	(—)	
	Rainfall Zone—IX ..				..				..	*Rainfall Pattern—E_4 (A_1 C_3) E_4*				
Junagadh														
Manavadar	12	6	6	—	8	5	6	5	0·4	—	0·4	—	—	94
	(24)	(12)	(12)	(—)	(17)	(11)	(12)	(10)	(1)	(—)	(1)	(—)	(—)	
Keshod	15	7	7	—	9	6	4	5	0·3	—	0·3	—	—	54
	(28)	(13)	(13)	(—)	(17)	(11)	(7)	(19)	(1)	(—)	(1)	(—)	(—)	
Malia	15	9	9	—	8	4	2	4	0·4	—	—	—	—	52
	(28)	(18)	(18)	(—)	(15)	(8)	(4)	(8)	(1)	(—)	(—)	(—)	(—)	
Talla	11	7	9	—	9	6	0·3	3	0·2	—	0·3	—	—	46
	(24)	(16)	(19)	(—)	(19)	(13)	(1)	(7)	(1)	(—)	(1)	(—)	(—)	
Mendarda	7	5	5	—	4	3	2	3	0·2	—	0·1	—	—	28
	(25)	(16)	(16)	(—)	(14)	(11)	(6)	(11)	(1)	(—)	(1)	(—)	(—)	
Vanthali	9	5	5	—	8	4	7	6	0·4	—	—	—	—	44
	(20)	(11)	(11)	(—)	(18)	(9)	(16)	(14)	(1)	(—)	(—)	(—)	(—)	
Junagadh	11	8	8	—	9	4	4	8	1	—	1	—	—	54
	(20)	(15)	(15)	(—)	(17)	(8)	(8)	(15)	(1)	(—)	(1)	(—)	(—)	
Mangrol	16	8	9	—	7	4	8	5	0·4	—	0·4	—	—	56
	(28)	(14)	(15)	(—)	(12)	(7)	(13)	(9)	(1)	(—)	(1)	(—)	(—)	
Surat														
Ghorari	10	4	5	—	17	6	3	19	1	—	1	—	—	66
	(15)	(6)	(8)	(—)	(26)	(9)	(5)	(29)	(1)	(—)	(1)	(—)	(—)	
Olpad	11	3	4	—	9	6	4	10	—	—	—	—	—	47
	(23)	(6)	(9)	(—)	(19)	(13)	(9)	(21)	(—)	(—)	(—)	(—)	(—)	
Bharuch														
Amod	7	1	1	—	4	3	1	5	0·4	—	0·2	—	—	23
	(32)	(4)	(4)	(—)	(17)	(13)	(4)	(23)	(2)	(—)	(1)	(—)	(—)	
Jambusar	14	2	3	0·2	9	7	1	11	0·4	—	0·4	—	—	49
	(30)	(4)	(7)	(1)	(18)	(15)	(1)	(22)	(1)	(—)	(1)	(—)	(—)	
Vgara	10	1	1	—	4	4	1	4	0·4	—	0·1	—	—	25
	(39)	(4)	(4)	(—)	(18)	(15)	(4)	(14)	(2)	(—)	(0·3)	(—)	(—)	
Bharuch	12	1	1	—	9	5	2	17	1	—	1	—	—	49
	(24)	(2)	(2)	(—)	(18)	(11)	(4)	(35)	(2)	(—)	(2)	(—)	(—)	
Hansat	7	3	3	—	4	2	1	4	0·2	—	—	—	—	24
	(31)	(12)	(12)	(—)	(13)	(8)	(4)	(17)	(1)	(—)	(—)	(—)	(—)	
Ankleshwar	10	3	4	—	4	3	2	6	0·3	—	0·2	—	—	33
	(29)	(10)	(11)	(—)	(13)	(10)	(6)	(19)	(1)	(—)	(1)	(—)	(—)	
	Rainfall Zone—X ..				..				..	*Rainfall Pattern—$E_4(A_1B_1C_1E_1)E_4$*				
Kheda														
Mehmedabad	18	3	5	—	21	14	1	6	—	—	0·4	—	—	68
	(26)	(4)	(7)	(—)	(31)	(21)	(1)	(9)	(—)	(—)	(1)	(—)	(—)	
Nadki (Kheda)	23	3	5	—	33	24	5	12	—	—	1	—	—	106
	(22)	(3)	(5)	(—)	(31)	(22)	(5)	(11)	(—)	(—)	(1)	(—)	(—)	
Kapadvanj	31	5	7	—	31	27	4	14	—	—	1	—	—	120
	(26)	(4)	(5)	(—)	(26)	(23)	(3)	(12)	(—)	(—)	(1)	(—)	(—)	
Sabarkantha														
Vijay Nagar	12	8	8	—	5	4	0·3	22	—	—	—	—	—	59
	(20)	(14)	(13)	(—)	(8)	(7)	(1)	(37)	(—)	(—)	(—)	(—)	(—)	
Bhiloda	28	13	12	—	12	9	2	38	—	—	1	—	—	114
	(24)	(11)	(11)	(—)	(11)	(8)	(1)	(33)	(—)	(—)	(1)	(—)	(—)	

APPENDIX 2 (*Contd.*)

District/taluk	Cattle			Buffaloes			Sheep	Goats	Horses & Ponies	Mules	Donkeys	Camels	Pigs	Total live-stock
	Male	Female	Young stock	Male	Female	Young stock								
	Rainfall Zone—X (Contd.) ..			..			..		*Rainfall Pattern—E_4 $A_1(B_1$ C_2 $E_1)$ E_4*					
Sabarkantha (*contd.*)														
Meghraj	22 (23)	12 (13)	11 (11)	— (—)	9 (9)	7 (7)	1 (1)	34 (36)	— (—)	— (—)	— (—)	— (—)	— (—)	95
Prantij	24 (25)	9 (10)	7 (7)	— (—)	23 (24)	16 (16)	2 (2)	13 (14)	— (—)	— (—)	1 (1)	1 (1)	— (—)	96
Himatnagar	19 (22)	7 (9)	7 (8)	— (—)	16 (19)	13 (15)	4 (5)	17 (20)	— (—)	— (—)	1 (1)	0·4 (1)	— (—)	85
Modasa	24 (23)	13 (13)	11 (10)	— (—)	16 (15)	13 (12)	2 (2)	23 (22)	— (—)	— (—)	1 (2)	1 (1)	— (—)	103
Malpur	13 (24)	6 (12)	5 (10)	— (—)	8 (16)	6 (12)	0·3 (1)	13 (24)	— (—)	— (—)	0·3 (1)	— (—)	— (—)	52
Bayad	20 (24)	6 (8)	6 (7)	— (—)	17 (20)	16 (19)	5 (6)	12 (15)	— (—)	— (—)	1 (1)	— (—)	— (—)	83
Idar	31 (24)	8 (6)	9 (7)	— (—)	28 (22)	22 (17)	2 (2)	25 (19)	— (—)	— (—)	2 (2)	1 (1)	— (—)	129
Ahmedabad														
Ahmedabad	3 (7)	7 (17)	4 (10)	— (—)	10 (24)	6 (14)	1 (2)	10 (24)	— (—)	— (—)	1 (2)	— (—)	— (—)	43
Daskray	19 (23)	7 (9)	6 (7)	— (—)	23 (28)	17 (20)	1 (1)	9 (11)	— (—)	— (—)	1 (1)	— (—)	— (—)	82
	Rainfall Zone—XI ..			..			..		*Rainfall Pattern—E_4 (A_1 B_1 C_2)E_4*					
Kheda														
Matar	15 (24)	6 (9)	7 (10)	— (—)	14 (23)	11 (18)	3 (5)	7 (10)	— (—)	— (—)	1 (1)	— (—)	— (—)	63
Borsad	17 (19)	2 (2)	4 (4)	— (—)	36 (38)	23 (25)	2 (2)	8 (9)	— (—)	— (—)	1 (1)	— (—)	— (—)	92
Petlad	13 (18)	2 (3)	3 (5)	— (—)	27 (36)	18 (25)	2 (3)	7 (9)	— (—)	— (—)	0·4 (1)	— (—)	— (—)	74
Thasra	20 (25)	4 (5)	6 (7)	— (—)	17 (21)	16 (26)	8 (10)	9 (11)	— (—)	— (—)	1 (1)	— (—)	— (—)	81
Balasinor	22 (29)	6 (8)	5 (6)	— (—)	14 (19)	12 (15)	4 (5)	13 (17)	— (—)	— (—)	1 (1)	— (—)	— (—)	77
Anand	19 (21)	2 (2)	3 (3)	— (—)	33 (36)	22 (24)	3 (3)	9 (10)	— (—)	— (—)	1 (1)	— (—)	— (—)	92
Panchmahals														
Santrampur	74 (28)	32 (12)	25 (9)	— (—)	31 (12)	23 (9)	— (—)	76 (29)	— (—)	— (—)	1 (1)	— (—)	— (—)	265
Godhra	49 (30)	23 (14)	19 (12)	— (—)	18 (11)	14 (9)	— (—)	39 (24)	— (—)	— (—)	1 (0·4)	— (—)	— (—)	164
Devgadh Baria	56 (32)	17 (10)	13 (8)	— (—)	17 (10)	13 (8)	— (—)	55 (32)	— (—)	— (—)	— (—)	— (—)	— (—)	173
Kalol	17 (32)	6 (11)	5 (10)	— (—)	10 (18)	7 (14)	— (—)	7 (13)	0·3 (1)	— (—)	0·4 (1)	— (—)	— (—)	52
Halol	18 (30)	8 (14)	7 (12)	— (—)	8 (14)	5 (9)	— (—)	12 (21)	— (—)	— (—)	— (—)	— (—)	— (—)	58
Bharuch														
Sagbara.	12 (41)	4 (14)	4 (14)	0·2 (1)	1 (3)	2 (6)	— (—)	6 (21)	— (—)	— (—)	— (—)	— (—)	— (—)	29
Jhagadia	16 (26)	9 (15)	11 (18)	— (—)	6 (10)	5 (8)	1 (1)	12 (21)	0·3 (1)	— (—)	— (—)	— (—)	— (—)	60
Valia	13 (27)	7 (15)	7 (15)	— (—)	4 (7)	3 (6)	8 (16)	6 (13)	0·2 (1)	— (—)	— (—)	— (—)	— (—)	49
Nanded	21 (25)	10 (12)	12 (15)	— (—)	8 (10)	6 (7)	1 (1)	25 (30)	— (—)	— (—)	— (—)	— (—)	— (—)	84
Dediapada	16 (38)	7 (18)	8 (19)	— (—)	1 (3)	1 (3)	— (—)	8 (19)	— (—)	— (—)	— (—)	— (—)	— (—)	42
Surat														
Mangrol	21 (33)	10 (16)	10 (16)	— (—)	5 (8)	4 (5)	1 (1)	13 (20)	0·4 (1)	— (—)	— (—)	— (—)	— (—)	65
Vadodara														
Sinor	6 (36)	1 (3)	1 (3)	— (—)	4 (23)	2 (13)	0·2 (1)	3 (18)	0·2 (1)	— (—)	0·3 (2)	— (—)	— (—)	18
Dabhai	14 (33)	2 (5)	3 (7)	— (—)	8 (19)	5 (13)	0·4 (1)	8 (20)	0.2 (1)	— (—)	0·3 (1)	— (—)	— (—)	42

APPENDIX 2 (*Concld.*)

District/taluk	Cattle			Buffaloes			Sheep	Goats	Horses & ponies	Mules	Donkeys	Camels	Pigs	Total live-stock
	Male	Female	Young stock	Male	Female	Young stock								
	Rainfall Zone—XI. (Contd.)			..			..		..	*Rainfall Pattern—E4(A1b1c2)E4*				
Karjan	13 (22)	1 (2)	2 (3)	— (—)	7 (12)	5 (8)	23 (38)	8 (13)	0·4 (1)	— (—)	0·3 (1)	— (—)	— (—)	58
Vaghodia	12 (28)	4 (10)	5 (11)	— (—)	7 (15)	5 (11)	6 (14)	5 (11)	— (—)	— (—)	— (—)	— (—)	— (—)	44
Vadodara	16 (21)	5 (6)	4 (6)	— (—)	19 (25)	11 (14)	0·4 (1)	20 (26)	— (—)	— (—)	1 (1)	— (—)	— (—)	76
Padra	14 (28)	1 (2)	3 (6)	— (—)	15 (30)	10 (19)	— (—)	7 (14)	— (—)	— (—)	0·4 (1)	— (—)	— (—)	50
	Rainfall Zone—XII			..		..		..	*Rainfall Pattern—E4 (A2 B1 C1) E4*					
Vadodara														
Sankheda	17 (32)	6 (12)	6 (10)	— (—)	8 (15)	6 (10)	0·3 (1)	10 (19)	0·3 (1)	— (—)	— (—)	— (—)	— (—)	54
Tilakwada	6 (29)	2 (10)	2 (10)	— (—)	2 (10)	2 (10)	0·2 (1)	6 (29)	0·1 (1)	— (—)	— (—)	— (—)	— (—)	21
Naswadi	12 (32)	6 (16)	6 (16)	— (—)	3 (7)	2 (5)	— (—)	8 (23)	0·2 (1)	— (—)	— (—)	— (—)	— (—)	37
Chhotaudaipur	47 (34)	16 (12)	15 (11)	— (—)	11 (8)	8 (6)	— (—)	40 (29)	— (—)	— (—)	— (—)	— (—)	— (—)	137
Panchmahals														
Jambughoder	4 (27)	2 (13)	2 (13)	— (—)	1 (7)	1 (7)	— (—)	5 (33)	— (—)	— (—)	— (—)	— (—)	— (—)	15
Surat														
Sangade	23 (35)	14 (21)	12 (18)	1 (2)	1 (2)	1 (1)	— (—)	14 (21)	— (—)	— (—)	— (—)	— (—)	— (—)	67
Vyara	26 (31)	15 (19)	16 (18)	1 (2)	5 (5)	4 (5)	1 (1)	16 (19)	— (—)	— (—)	— (—)	— (—)	— (—)	84
Palsana	5 (23)	2 (9)	2 (12)	— (—)	4 (19)	2 (9)	1 (4)	5 (24)	— (—)	— (—)	— (—)	— (—)	— (—)	20
Mahuva	10 (24)	7 (19)	8 (20)	— (—)	4 (11)	3 (8)	1 (2)	6 (16)	— (—)	— (—)	— (—)	— (—)	— (—)	40
Valod	7 (28)	4 (15)	4 (18)	— (—)	2 (10)	2 (8)	1 (4)	4 (17)	— (—)	— (—)	— (—)	— (—)	— (—)	24
Mandvi	20 (30)	12 (19)	12 (19)	— (—)	4 (6)	3 (5)	1 (1)	13 (20)	0·1 (0·2)	— (—)	0·2 (0·3)	0·2 (0·3)	— —	65
Nijhar	12 (34)	6 (17)	5 (14)	0·2 (1)	2 (6)	1 (4)	— (—)	8 (23)	0·4 (1)	— (—)	— (—)	— (—)	— (—)	36
Uchhal	11 (38)	5 (18)	4 (15)	0·1 (1)	0·4 (2)	0·2 (1)	— (—)	7 (25)	— (—)	— (—)	— (—)	— (—)	— (—)	58
Kamrej	7 (19)	3 (8)	4 (10)	— (—)	6 (14)	3 (8)	6 (19)	10 (26)	— (—)	— (—)	0·3 (1)	— (—)	— (—)	39
Bardoli	10 (22)	5 (11)	6 (13)	— (—)	8 (18)	5 (10)	2 (5)	9 (20)	— (—)	— (—)	0·3 3 (1)	— (—)	— (—)	46
	Rainfall Zone—XIII			..		..			..	*Rainfall Pattern—E4(A2 B2) E4*				
Bulsar														
Gandevi	7 (18)	4 (10)	5 (13)	— (—)	7 (18)	5 (12)	2 (5)	9 (22)	— (—)	— (—)	— (—)	— (—)	0·3 (1)	39
Chikhli	24 (25)	16 (16)	16 (16)	1 (1)	10 (10)	7 (7)	4 (4)	21 (21)	— (—)	— (—)	— (—)	— (—)	— (—)	99
Bansda	19 (26)	12 (16)	12 (17)	4 (6)	3 (4)	3 (4)	— (—)	20 (27)	— (—)	— (—)	— (—)	— (—)	— (—)	74
Navsari	13 (18)	6 (8)	— (—)	15 (21)	9 (12)	5 (7)	18 (25)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	72
	Rainfall Zone—XIV			..			..		..	*Rainfall Pattern—E4 (A3 B1) E4*				
Valsad														
Umbergaon	16 (34)	9 (20)	8 (18)	2 (4)	2 (4)	1 (2)	1 (2)	7 (15)	0·3 (1)	— (—)	— (—)	— (—)	— (—)	46
Pardi	22 (29)	18 (23)	16 (20)	1 (2)	3 (4)	2 (3)	3 (4)	12 (15)	— (—)	— (—)	— (—)	— (—)	— (—)	78
Valsad	18 (25)	13 (18)	14 (19)	0·4 (1)	7 (10)	5 (6)	2 (3)	13 (18)	0·2 (0·2)	— (—)	— (—)	— (—)	— (—)	72
Dharampur	36 (29)	26 (21)	24 (19)	4 (3)	2 (2)	2 (2)	2 (1)	29 (23)	— (—)	— (—)	— (—)	— (—)	— (—)	125
The Dangs														
Ahwa	20 (26)	18 (24)	18 (24)	3 (4)	1 (2)	1 (1)	— (—)	14 (19)	— (—)	— (—)	— (—)	— (—)	— (—)	76

APPENDIX 3

Rainfall and Cropping Patterns

GUJARAT

Cropping patterns	District/taluk	Geographical area (sq km)	Elevation (masl) max	Elevation (masl) min	Annual rainfall (total cm)	rd	mmr	mr	*Consecutive months nd	a	b	c
	Rainfall Zone—I								*Rainfall Pattern—$E_4(C_1D_1E_2)E_4$*			
	Kutch											
$JK_3C_4F_4$	Mundra	888	100	sl	36	15	7	28	11	—	—	—
	Anjar	1312	100	sl	34	17	7	23	11	—	—	—
$B_3F_4Jk_4Pu_4/W_4$	Abdasa	2400	188	sl	29	13	7	21	9	—	—	—
	Rapar	2998	100	sl	35	17	7	24	11	—	—	—
	Bhachau	2000	50	sl	34	15	7	24	11	—	—	—
B_3 Gn_3	Lakhpat	1942	88	sl	25	10	7	20	7	—	—	—
Pu_4 F_4 Jk_4 B_4	Bhuj	4528	298	sl	34	15	7	23	10	—	—	—
Gn_4 Pu_4 B_4 F_4/Jk_4	Mandvi	1425	144	sl	41	17	7	30	11	—	—	—
B2 Jk4	Nakhatrana	1984	388	sl	27	13	7	19	9	—	—	—
	Jamnagar											
$Gn_3B_4Jk_4/C_4$	Okhamandal	717	10	sl	36	16	7	29	15	6-2	29	15
	Kalyanpur	1412	92	sl	44	na	7	31	na	7-2	31	na
	Rainfall Zone—II								*Rainfall Pattern—$E_4(C_1D_3)E_4$*			
	Amreli											
$Gn_3B_4Jk_4/C_4$	Liliya	395	105	100	62	na	7	38	na	7-3	49	na
	Lathi	633	150	100	54	na	7	37	na	7-2	37	na
Gn_2B_4/Jk_4	Khambha	407	529	150	52	na	7	29	15	6-2	29	15
	Dhari	1094	248	150	53	na	7	35	na	7-2	35	na
	Amreli	830	140	100	52	na	7	28	13	6-2	28	13
	Babra	793	239	150	57	na	7	33	na	6-4	53	na
	Bhavnagar											
Gn_3B_3	Savarkundla	1644	216	100	38	na	7	23	na	—	—	—
	Gariadhar		100	61	na	na	na	na	na	na	na	na
	Rainfall Zone—III								*Rainfall Pattern—$E_4(C_2D_1E_1)E_4$*			
	Mehsana											
$B_4Jk_4W_4O_4/C_4/Gn_4$	Chanasma	888	100	50	51	na	7	33	na	7-3	46	na
	Harij	407	60	50	42	na	7	31	na	7-2	31	na
$C_4Jk_4(B_4)$	Sami	1510	100	10	42	na	7	27	na	7-2	27	na
	Jamnagar											
$Gn_3Jk_4B_4$	Jodiya	869	28	sl	44	na	7	30	na	7-2	30	na
	Banaskantha											
B_2 F_4	Vav	1701	41	10	37	na	7	21	na	—	—	—
	Tharad	1358	140	42	51	20	7	37	14	7-2	37	14
	Deodar	1012	68	42	41	na	7	24	na	7-3	36	na
	Santalpur	1352	67	10	39	na	7	27	na	7-2	27	na
$B_3Jk_4F_4/C_4(W_5)$	Dhanera	1190	199	150	39	na	7	21	na	7-3	31	na
	Radhanpur	596	42	34	51	23	7	38	16	7-2	38	16
	Kankrej	822	60	50	53	na	7	30	na	7-3	46	na

masl =metres above sea level
rd =rainy days
mmr =month of maximum rainfall
mr =total rainfall of mmr plus that of preceding or following month whichever is higher, in cm.
nd =number of rainy days of mmr plus that of preceding or following month, whichever has higher rainfall.
sl =sea level

*Consecutive months with rainfall of more than 10 cm per month
a=Initial month with more than 10 cm of rainfall and number of consecutive months with more 10 cm/month, separated by hyphen
b=Total rainfall of consecutive months under 'a' in cm
c=Total number of rainy days of consecutive months under 'a'
na=not available

NOTES: 1. Information on rainfall and rainy days is based on the Memoirs of India Meteorological Department, Vol. XXXI, Part III as on 12th May, 1961.

2. For explanation of coded form of rainfall and cropping patterns, reference may be made to section 2 in the text.

APPENDIX 3 (*Contd.*)

Cropping patterns	District/taluk	Geographical area (sq km)	Elavation (masl) max	Elavation (masl) min	Annual rainfall total (cm)	rd	mmr	mr	nd	*Consecutive months a	b	c
	Rainfall Zone—IV	..		..		..		*Rainfall Pattern—$E_4(C_2D_2)E_4$*				
	Surendranagar											
$B_3Gn_4C_4Jk_4/F_4$	Sayla	937	237	150	46	na	8	30	na	7-2	30	na
$C_2\ Jk_4/B_4$	Dasada	1643	26	10	30	na	8	23	na	7-2	23	na
	Limbdi	1713	100	38	64	na	9	34	na	7-3	52	na
C_3Jk_4B4	Wadhwa	797	150	100	49	24	7	31	14	7-2	31	14
	Muli	936	150	100	na	na	na	na	na	na	na	na
	Bhavnagar											
$B3Gn4Jk_4$	Umrala	407	100	50	51	na	9	27	na	6-4	51	na
	Gadhada	897	150	100	55	na	8	33	na	6-4	53	na
	Sehor	721	100	50	56	na	7	35	na	7-3	45	na
$Jk_3B_4Gn_4/W_4$	Vallabhipur	594	100	50	58	na	9	35	na	8-2	35	na
	Rainfall Zone—V	..		..		..		*Rainfall Pattern—$E_4B_1C_1E_1)E_4$*				
	Jamnagar											
Gn_1	Bhanvad	732	637	300	65	na	7	35	na	7-2	35	na
	Jamjodhpur	1084	362	150	62	na	7	44	na	7-2	44	na
	Kalavad	1245	169	150	43	na	7	29	na	7-2	29	na
Gn_2Jk_4/B_4	Khambhaliya	1214	38	sl	62	na	7	46	na	7-2	46	na
	Lalpur	1075	150	38	56	na	7	34	na	7-3	44	na
$Gn_3Jk_4B_4$	Jamnagar	1226	18	sl	47	21	7	33	14	7-2	33	14
	Dhrol	597	113	28	61	na	7	45	na	7-2	45	na
	Junagadh											
$B_3Gn_4Jk_4$	Una	1568	256	sl	63	na	7	46	na	6-3	57	na
Gn_1	Bhesan	439	600	150	na	na	na	na	na	na	na	na
$Gn_2W_4/C_4/J_{1\,4}$	Visavadar	902	150	100	na	na	na	na	na	na	na	na
$Gn_3B_4Jk_4$	Patanveraval	688	56	sl	53	25	7	33	13	6-2	33	13
$Gn_3C_4F_4/Jr_4$	Ranavav	588	100	10	76	na	7	33	na	—	—	—
	Kutiyana	566	100	10	64	na	7	55	na	6-3	66	na
$Gn_4Jr_4F_4B_4$	Porbandar	1141	150	sl	50	23	7	23	12	—	—	—
	Amreli											
$B_3Gn_4S_4$	Kodinar	521	28	sl	75	na	7	57	na	6-3	70	na
$B_3Jk_4Gn_4$	Rajula	850	150	sl	57	na	7	36	na	7-2	36	na
	Jafrabad	355	10	sl	58	31	7	34	16	6-3	44	24
Gn_1	Kunkavarvadia	834	194	150	56	na	7	38	na	7-2	38	na
	Rajkot											
	Dhoraji	484	314	82	61	32	7	37	19	6-3	47	24
	Jetpur	679	100	82	56	na	7	44	na	7-2	44	na
	Jamkandarna	567	146	100	59	na	7	41	na	7-2	41	na
	Gondal	1194	176	100	62	32	7	38	19	6-3	49	23
	Lodhika	373	150	100	43	na	7	32	na	7-2	32	na
Gn_1	Paddhari	646	113	84	49	na	7	35	na	7-2	35	na
	Kotdasangani	447	264	150	56	na	7	38	na	7-2	38	na
Gn_2B_4/C_4	Upleta	793	298	50	na	na	na	na	na	na	na	na
	Rajkot	1058	150	113	59	29	7	37	17	7-2	37	17
	Jaslan	1327	254	150	62	30	7	38	18	7-2	38	18
$Gn_3B_4Jk_4/C_4$	Morvi	1697	100	50	53	24	7	39	16	7-2	39	16
	Wankaner	1118	183	100	56	27	7	38	17	7-2	38	17
C_3Jk_4/B_4	Maliya	770	50	11	64	na	8	44	na	7-3	59	na
	Surendranagar											
$B_3Gn_4Jk_4/F_4$	Ghotila	1058	346	100	69	na	8	44	na	7-3	59	na
C_2Jk_4/B_4	Lakhtar	734	50	23	49	na	7	30	na	7-2	30	na
	Halvad	1232	62	10	68	na	7	40	na	7-3	59	na
	Dhrangadhra	1370	100	10	51	24	7	34	15	7-2	34	15
	Mahesana											
$B_4Jk_4W_4O_4/C_4/Gn_4$	Patan	1047	150	100	62	28	7	46	20	7-2	46	20
	Sidhpur	671	150	100	52	na	7	34	na	6-3	44	na
	Kheralu	953	370	150	54	na	8	38	na	7-2	38	na
	Mahsana	791	100	50	61	32	7	44	23	7-2	44	23
	Banaskantha											
$B_4Jk_4W_4/F_4$	Vadgam	565	290	150	59	na	7	38	na	7-3	51	na
	Ahmadabad											
	Viramgam	1714	37	27	59	29	7	41	19	7-2	41	19

APPENDIX 3 (*Contd.*)

Cropping patterns	District/taluk	Geog-raphical area (sq km)	Elevation (masl) max	Elevation (masl) min	Annual rainfall total (cm)	rd	mmr	mr	nd	*Consecutive months a	b	c
	Rainfall Zone—VI	..	..		..			*Rainfall Pattern—$E_4(B_1C_2E_1)E_4$*				
	Bhavnagar											
$B_3Gn_4Jk_4$	Botad	750	150	50	66	na	7	44	na	7-3	57	na
	Palitana	735	498	100	62	32	7	34	18	7-3	46	24
$Jk_3B_4Gn_4/W_4$	Bhavnagar	1462	14	sl	62	30	7	37	17	7-3	47	23
Gn_3B_3	Ghogha	437	100	10	61	31	7	36	19	7-3	46	23
	Talaja	870	100	sl	64	na	7	37	na	6-4	65	na
	Mahuva	1220	170	sl	57	32	7	33	17	6-3	43	25
	Mahesana											
$B_3W_4O_4F_4/Jk_4$	Vijapur	940	150	100	63	na	7	37	na	7-3	53	na
	Visnagar	488	131	100	52	na	7	34	na	7-3	46	na
$B_4C_4W_4Jk_4$	Kalol	487	74	50	69	35	7	48	24	7-3	59	28
	Kadi	830	50	48	60	na	7	40	na	7-3	53	na
	Ahmadabad											
$B_3Gn_4C_4$	Dehgam	620	100	50	61	na	7	39	na	7-3	52	na
	Dhandhuka	2719	100	10	61	30	7	38	17	7-2	38	17
$C_3Jk_4W_4/Pd_4$	Dolka	1728	47	10	71	34	7	44	22	7-3	59	28
	Sanand	800	50	31	68	32	7	47	21	7-2	47	21
	Vadodara											
$C_4Mt_4Pd_4Jr_4/Gn_4M_4$	Jambuagam	723	333	150	63	28	7	38	14	6-3	49	21
	Gandhi Nagar											
$B_3C_4Jk_4W_5$	Gandhi Nagar	649	100	50	na	na	na	na	na	na	na	na
	Kheda											
$W_4B_4C_4Pd_4$	Gambay	1195	32	sl	69	34	7	44	21	7-3	57	27
	Rainfall Zone—VII	..	..		..			*Rainfall Pattern—$E_4(B_2E_2)E_4$*				
	Banaskantha											
$B_3Jk_4W_5$	Deesa	1481	205	135	62	28	7	46	19	7-2	46	19
$B_4Jk_4W_4/F_4$	Palanpur	1047	1090	150	75	32	7	55	22	7-2	55	22
$M_4Mt_4W_4F_4B_4$	Danta	857	600	300	86	na	7	56	na	6-4	83	na
	Sabarkantha											
$M_3C_4W_5$	Khedbrama	846	450	300	70	na	7	49	na	7-3	64	na
	Rainfall Zone—VIII	..	..		..			*Rainfall Pattern—$E_4(B_2C_2)E_4$*				
	Panchmahals											
$B_4M_4Pd_4R_4$	Shehera	580	176	100	79	na	7	49	na	6-4	76	na
$M_3Pd_4Gn_4/Mt_4/B_4$	Limkheda	1064	533	150	70	na	7	43	na	6-3	59	na
	Dohad	874	378	300	81	41	7	48	26	6-4	75	37
$M_4Pd_4Gn_4G_4$	Jhalod	798	378	300	84	40	7	52	25	6-4	79	36
$M_4Pd_4Gn_4Mt_4/B_4$	Lunavada	946	244	300	78	37	7	51	24	7-3	65	30
	Vadodara											
$\frac{C_3Jr_4Pd_4To_4/Mt_4}{(B_4To_4)}$	Savli	792	50	10	81	na	7	53	na	7-3	69	na
	Rainfall Zone—IX	..	..		..			*Rainfall Pattern—$E_4(A_1C_3)E_4$*				
	Junagadh											
Gn_1	Manavadar	592	50	29	75	na	7	52	na	6-3	62	na
	Keshod	563	50	10	91	na	7	56	na	6-3	68	na
	Malia	540	150	sl	98	na	7	70	na	6-3	87	na
	Talada	954	150	56	95	na	7	61	na	6-4	92	na
	Mendarda	364	480	150	75	na	7	55	na	6-3	65	na
$Gn_2W_4/C_4/Jr_4$	Vanthali	393	50	29	93	na	7	74	na	6-3	86	37
	Junagadh	677	1117	150	84	40	7	53	25	6-4	80	na
$Gn_3JK_4F_4$	Mangrol	566	10	sl	76	na	7	52	na	6-3	63	na
	Surat											
$Jk_3C_4Gn_4Pd_4/Fr_4$	Ghorasi	583	10	sl	107	48	7	64	29	6-4	101	45
C_3Jk_4	Olpad	687	10	sl	91	42	7	53	26	6-4	85	39
	Bharuch											
C_1	Amod	465	50	10	83	37	7	51	23	6-4	78	34
C_2Jr_4	Jambusar	1097	10	sl	75	36	7	48	23	7-3	61	29
	Vagra	884	10	sl	81	38	7	49	23	-64	75	35
	Bharuch	666	10	sl	88	40	7	51	24	6-4	82	37
C_3Jk_4	Hansat	399	10	sl	83	37	7	50	22	6-4	78	34
$C_3Jr_4Jk_4$	Ankleshwar	414	10	sl	94	43	7	56	26	6-4	88	40

APPENDIX 3 (*Contd.*)

Cropping patterns	District/taluk	Geographical area (sq km)	Elevation (masl) max	Elevation (masl) min	Annual rainfall total (cm)	rd	mmr	mr	nd	*Consecutive months a	b	c
	Rainfall Zone—X ..		..		..				*Rainfall Pattern—$E_4(A_1B_1C_1E_1)E_4$*			
	Kheda											
$B_3Pd_4Mt_5To_4/W_4$	Mehmedabad	497	50	30	88	39	7	60	26	6-4	84	36
	Nadiad (Kheda)	663	50	29	79	37	7	55	25	7-3	67	31
$Gn_4B_4C_4Pd_4$	Kapadvan	985	102	100	80	37	7	55	25	7-3	68	30
	Sabarkantha											
$M_2\ Pd_4$	Vijaynagar	456	450	300	84	na	7	47	na	6-4	69	na
$M_4C_4Pd_4Gn_4B_4/W_4$	Bhiloda	724	450	300	na	na	na	na	na	na	na	na
	Meghraj	545	300	150	76	na	7	51	na	7-3	68	na
$Gn_3B_4C_4$	Prantiji	824	150	100	74	35	7	52	24	7-3	63	29
	Himatnagar	771	240	150	79	36	7	56	25	7-3	68	30
$Gn_4B_4M_4C_4$	Modasa	867	150	100	83	38	7	58	25	7-3	70	31
	Malpura	368	150	100	67	na	7	44	na	7-3	61	na
	Bayad	737	150	100	78	37	7	55	25	7-3	67	30
$C_4Gn_4M_4B_5$	Idar	1135	490	150	97	41	7	72	29	7-3	84	35
	Ahmedabad											
$B_4Jk_4Pd\ F_4/W_4$	Ahmedabad	287	73	63	78	37	7	55	24	7-3	67	30
	Daskroi	699	66	50	na	na	na	na	na	na	na	na
	Rainfall Zone—XI ..		..		..				*Rainfall Pattern—$E_4(A_1B_1\ C_2)E_4$*			
	Kheda											
$Pd_3W_4B_4C_4$	Mator	577	39	29	73	35	7	50	23	7-3	61	28
$B_3Pd_4Mt_5To_4/W_4$	Barsad	609	10	sl	89	38	7	58	25	6-4	85	36
	Petlad	474	30	10	86	na	7	59	na	6-4	83	na
$C_4B_4Pd_4M_4/To_4$	Thasra	660	100	50	78	36	7	53	23	7-3	66	30
	Balasinor	552	100	50	91	38	7	61	25	6-4	87	35
$To_3B_4Pd_4$	Anand	676	50	10	88	38	7	60	25	6-4	85	36
	Panchmahals											
$M_3Pd_4Gn_4/Mt_4/G_4$	Santrampur	1360	294	150	99	42	7	68	28	6-4	95	39
	Godhra	1019	281	50	103	43	7	68	28	6-4	99	40
	Devgad Baria	1145	300	150	103	47	7	65	30	6-4	98	44
$Gn_4Pd_4B_4C_4$	Kotol	398	100	50	105	42	7	71	27	6-4	101	39
$C_4Pd_4Mt_4Gn_4/Jr_4$	Halol	519	829	100	111	45	7	73	29	6-4	107	42
	Bharuch											
$Jr_4Pd_4C_4Mt_4$	Sagbara	400	598	150	na	na	na	na	na	na	na	na
C_2Jr_4	Jhagadia	813	450	50	90	na	7	57	na	6-4	88	na
$C_3Jr_4Jk_4$	Valia	514	150	50	127	53	7	77	32	6-4	119	49
$C_3Jr_4Pd_4$	Nandod (Rajpipla)	1131	476	50	98	47	7	59	29	6-4	92	43
$C_4Pd_4Jk_4Mt_4$	Dediapada	1023	799	150	111	58	7	82	37	6-4	124	55
	Surat											
$Jk_3C_4Gn_4Fd_4/Fr_4$	Mangrol	782	150	10	122	52	7	77	33	6-4	114	48
	Vadodara											
C_1	Sinor	293	50	10	95	na	7	65	na	7-3	85	na
	Dabhoi	633	100	50	111	47	7	71	30	6 4	105	44
	Karjan	602	50	10	88	na	7	56	na	7-3	75	na
C_2Jr_4	Vaghodia	565	100	50	91	na	7	60	na	6-4	90	na
$C_3Jr_4Pd_4To_4/Mt_4$ / (B_4To_4)	Vadodara	670	50	10	92	40	7	58	25	6-4	86	37
	Padra	535	10	sl	118	na	7	74	na	6-4	113	na
	Rainfall Zone—XII ..		..		..				*Rainfall Pattern—$E_4(A_2B_1C_1)E_4$*			
	Vadodara											
C_2Jr_4	Sankheda	723	300	150	106	na	8	61	na	6-4	103	na
	Tilokwada	245	300	150	109	na	7	70	na	6-4	106	na
$C_3\ Jr_4\ Pd_4$	Nasvadi	532	300	150	na	na	na	na	na	na	na	na
$C_4Mt_4Pd_4Jr_4/(Gn_4M_4)$	Chhota-Udaipur	1379	300	150	118	53	7	78	34	6-4	112	49
	Pacnhmahals											
$C_4Pd_4Mt_4Gn_4/Jr_4$	Jambughoda	146	427	300	126	52	7	84	34	6-4	120	49

APPENDIX 3 (*Concld.*)

Cropping patterns	District/taluk	Geographical area (sq km)	Elevation (masl) max	Elevation (masl) min	Annual rainfall total (cm)	rd	mmr	mr	nd	*Consecutive months a	b	c
	Rainfall Zone—XII(contd)	..		..		..		*Rainfall Pattern—$E_4(A_2B_1C_2)E_4$*				
	Surat											
$Pd_4Jk_4Gn_4Pu_4/Mt_4$	Sangadh	853	450	100	157	68	7	104	45	6-4	149	64
	Vayara	813	300	50	161	na	7	112	na	6-4	160	na
$Pd_4Jk_4Gn_4C_4Pu_4/Mt_4$	Palsana	201	10	sl	146	na	7	98	na	6-4	144	na
$Jk_4\ Pd_4C_4Gn_4/Fr_4/Pu_4$	Mahuva	354	50	10	159	na	7	100	na	6-4	153	na
	Valod	202	100	50	143	61	7	94	39	6-4	136	57
$Jk_3C_4Gn_4Pd_4/Fr_4$	Mandvi	731	150	50	134	57	7	87	36	6-4	128	54
$Jr_2\ Gn_4\ W_4$	Nizar	400	150	100	na	na	na	na	na	na	na	na
$Jr_4\ Pd_4\ Mt_4C_4$	Uchhal	324	300	100	na	na	na	na	na	na	na	na
$C_4JK_4Pd_4Fr_4/Pu_4$	Kamraj	379	50	10	na	na	na	na	na	na	na	na
	Bardoli	379	50	10	134	58	7	86	37	6-4	127	55
	Rainfall Zone—XIII	..		..		..		*Rainfall Pattern—$E_4(A_2B_2)E_4$*				
	Valsad											
$Pd_3Pu_4Jk_4/R_4$	Gandevi	284	10	sl	180	na	7	127	na	6-4	177	na
	Chikhli	575	100	10	169	67	7	110	43	6-4	161	63
$Pd_3\ Jk_4R_4$	Bansda.	600	675	50	188	75	7	130	47	6-4	181	70
$Jk_4C_4Pu_4Pd_4u$	Navsari	136	50	sl	146	56	7	89	35	6-4	138	52
	Rainfall Zone—XIV	..		..		..		*Rainfall Pattern—$E_4(A_3B_1)E_4$*				
	Valsad											
Pd_1	Umbegaon	361	100	sl	151	63	7	93	32	6-4	144	95
Pd_2Fr_4	Parli	428	50	sl	184	70	7	119	44	6-4	177	67
	Valsad	510	50	sl	181	66	7	113	41	6-4	173	62
$Pd_3Pu_4Jk_4/R_4$	Dharampur	1650	682	100	241	78	7	169	49	6-4	232	73
	Dangs											
$R_3\ Mt_4O_4Pd_4$	Ahua	1683	1053	300	178	82	7	117	50	6-4	168	75

APPENDIX 4

Area under Principal Crops—1968-69
GUJARAT

(000'ha)

District/Taluk	Gross cropped area	pd	Jk	Jr	B	M	R	W	Ba	Mt	G	T	Pu	S	Gn	O	C	To	F	Misc
		Rainfall Zone—I ..				..			..			..			..	*Rainfall Pattern—$E_4(C_1D_1E_2)E_4$*				
Kutch																				
Mundra	45	—	14	—	5	—	—	0·3	—	—	—	—	6	—	2	—	9	—	8	0·5
		(—)	(31)	(—)	(10)	(—)	(—)	(1)	(—)	(—)	(—)	(—)	(14)	(—)	(5)	(—)	(20)	(—)	(18)	(1)
Amjar	79	—	27	1	10	—	—	1	—	—	—	—	11	—	2	—	16	—	11	—
		(—)	(34)	(1)	(13)	(—)	(—)	(1)	(—)	(—)	(—)	(—)	(14)	(—)	(2)	(—)	(21)	(—)	(14)	(—)
Abdosa	4	—	0·4	—	1	—	—	1	—	—	—	—	1	—	—	—	—	—	1	0·3
		(—)	(1·0)	(—)	(25)	(—)	(—)	(25)	(—)	(—)	(—)	(—)	(4)	(—)	(—)	(—)	(—)	(—)	(25)	(7)
Ropar	112	—	17	—	42	—	—	3	—	—	—	—	14	—	1	5	12	—	16	2
		(—)	(15)	(—)	(37)	(—)	(—)	(3)	(—)	(—)	(—)	(—)	(13)	(—)	(1)	(4)	(11)	(—)	(14)	(2)
Bhachau	96	—	12	—	28	—	—	1	—	—	—	—	15	—	1	6	14	—	19	—
		(—)	(12)	(—)	(30)	(—)	(—)	(1)	(—)	(—)	(—)	(—)	(16)	(—)	(1)	(6)	(14)	(—)	(20)	(—
Lakhpat	0·8	—	—	—	0·3	—	—	0·1	—	—	—	—	—	—	0·3	—	—	—	—	0·1
		(—)	(—)	(—)	(38)	(—)	(—)	(13)	(—)	(—)	(—)	(—)	(—)	(—)	(38)	(—)	(—)	(—)	(—)	(11)
Bhuj	80	—	13	—	12	—	—	3	—	—	—	—	23	—	5	1	3	—	20	(—)
		(—)	(16)	(—)	(15)	(—)	(—)	(4)	(—)	(—)	(—)	(—)	(28)	(—)	(7)	(1)	(4)	(—)	(25)	(—)
Mandvi	38	—	9	0·2	5	—	—	1	—	—	—	—	5	—	11	0·2	3	—	4	—
		(—)	(24)	(1)	(14)	(—)	(—)	(2)	(—)	(—)	(—)	(—)	(12)	(—)	(28)	(1)	(8)	(—)	(10)	(—)
Nakahtnan	52	—	2	—	9	0·3	—	4	1	—	—	—	12	—	15	—	1	—	8	—
		(—)	(4)	(—)	(17)	(1)	(—)	(8)	(1)	(—)	(—)	(—)	(23)	(—)	(19)	(—)	(1)	(—)	(16)	(—)
Jamnagar																				
Okhamandal	24	—	7	—	14	—	—	0·3	—	—	—	—	2	—	1	—	—	—	0·2	1
		(—)	(29)	(—)	(59)	(—)	(—)	(1)	(—)	(—)	(—)	(—)	(1)	(—)	(4)	(—)	(—)	(—)	(1)	(5)
Kalyanpur	87	—	19	—	23	—	—	2	—	—	—	—	—	—	23	5	12	—	2	1
		(—)	(21)	(—)	(27)	(—)	(—)	(3)	(—)	(—)	(—)	(—)	(—)	(—)	(26)	(6)	(14)	(—)	(2)	(1)
		Rainfall Zone—II ..				..			..			..			..	*Rainfall Pattern—$E_4(C_1D_3)E_4$*				
Amreli																				
Libya	32	—	6	—	11	—	—	1	—	—	—	—	—	0·3	9	1	2	—	—	2
			(19)	(—)	(34)	(—)	(—)	(3)	(—)	(—)	(—)	(—)	(—)	(1)	(28)	(3)	(6)	(—)	(—)	(6)
Lathi	53	—	6	—	11	—	—	1	—	—	—	—	—	0·3	9	1	2	—	—	2
		(—)	(19)	(—)	(34)	(—)	(—)	(3)	(—)	(—)	(—)	(—)	(—)	(1)	(28)	(3)	(6)	(—)	(—)	(6)

Pd=paddy
Jk=jowar kharif
Jr=jowar rabi
B=bajra
M=maize
R=ragi
W=wheat
Ba=barley
Mt=millets
Gr=gram
T=tur
Pu=other pulses
S=sugarcane
Gn=groundnut
O=other oilseeds
C=cotton
To=tobacco
F=fodder
Misc.=miscellaneous crops
—nil or negligible

NOTES : 1 Figures in brackets represent percentages to gross cropped area.
2 The percentage figures have been rounded off individually and hence cross totals may not, in some cases, add upto 100.

APPENDIX 4 (*Contd*)

(000'ha)

District/taluk	Gross cropped area	pd	Jk	Jr	B	M	R	W	Ba	Mt	G	T	Pu	S	Gn	O	C	To	F	Misc
	Rainfall Zone—II (Concld)															*Rainfall Pattern—$E^4(C^1D)^3E^4$*				
Khambha	26	—	1	—	6	—	—	0·4	—	—	—	—	0·3	—	12	0·3	0·3	—	—	6
		(—)	(4)	(—)	(14)	(—)	(—)	(2)	(—)	(—)	(—)	(1)	(1)	(—)	(48)	(1)	(1)	(—)	—	(28)
Dhari	74	(—)	(7)	(—)	(2)	—	—	2	—	—	—	—	1	1	35	2	1	—	—	11
		(—)	(9)	(—)	(19)	(—)	(—)	(3)	(—)	(—)	(—)	(—)	(1)	(1)	(47)	(3)	(1)	(—)	(—)	(16)
Amreli	76	—	8	0·4	16	—	—	5	—	—	—	—	—	0·5	39	1	2	—	—	—
		(—)	(11)	(0·5)	(21)	(—)	(—)	(7)	(—)	(—)	(—)	(—)	(—)	(1)	(41)	(2)	(3)	(—)	(—)	(—)
Babra	58	—	10	—	1	—	—	1	—	—	—	—	—	—	33	—	3	—	—	9
		(—)	(18)	(—)	(1)	(—)	(—)	(2)	(—)	(—)	(—)	(—)	(—)	(—)	(57)	(—)	(5)	(—)	(—)	(17)
Bhavnagar																				
Savarkundla	86	—	7	—	25	—	—	2	—	—	—	—	1	1	37	1	3	—	—	9
		(—)	(8)	(—)	(29)	(—)	(—)	(2)	(—)	(—)	(—)	(—)	(1)	(1)	(43)	(2)	(4)	(—)	—	(10)
Gariadhar	41	—	7	—	14	—	—	—	—	—	—	—	—	0·4	16	1	2	—	—	—
		(—)	(17)	(—)	(34)	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(1)	(40)	(2)	(4)	(—)	(—)	(—)
	Rainfall Zone—III														*Rainfall Pattern—$E_4(C_2D_1E_1)E_4$*					
Mehsana																				
Chanasma	72	0·2	18	—	20	—	—	2	—	—	—	1	2	—	1	9	10	—	3	6
		(0·2)	(25)	(—)	(28)	(—)	(—)	(3)	(—)	(—)	(—)	(1)	(3)	(—)	(1)	(113)	(14)	(—)	(4)	(8)
Hari	31	—	8	—	9	—	—	2	—	—	—	—	0·3	—	1	3	5	—	1	2
		(—)	(25)	(—)	(28)	(—)	(—)	(6)	(—)	(—)	(—)	(—)	(1)	(—)	(3)	(9)	(16)	(—)	(6)	(6)
Sami	95	—	23	—	14	—	—	10	—	—	—	0·3	0·1	—	0·3	1	44	—	1	2
		(—)	(24)	(—)	(15)	(—)	(—)	(11)	(—)	(—)	(—)	(0·3)	(0·2)	(—)	(0·3)	(1)	(45)	(—)	(1)	(2)
Jamnagar																				
Jodiya	52	—	12	—	9	—	—	6	—	—	—	—	—	1	16	2	6	—	—	—
		(—)	(23)	(—)	(17)	(—)	(—)	(12)	(—)	(—)	(—)	(—)	(—)	(2)	(31)	(4)	(11)	(—)	(—)	(—)
Banaskantha																				
Vav	96	—	6	—	66	—	—	0·4	—	—	—	—	7	—	—	1	—	—	8	8
		(—)	(6)	(—)	(69)	(—)	(—)	(1)	(—)	(—)	(—)	(—)	(7)	(—)	(—)	(1)	(—)	(—)	(8)	(8)
Thrad	124	—	6	1	69	—	—	4	—	—	—	—	6	—	—	3	—	—	—	35
		(—)	(5)	(1)	(55)	(—)	(—)	(4)	(—)	(—)	(—)	(—)	(5)	(—)	(—)	(2)	(—)	(—)	(—)	(28)
Deodar	94	—	10	—	52	—	—	5	—	—	—	—	5	—	—	2	1	—	10	9
		(—)	(11)	(—)	(54)	(—)	(—)	(5)	(—)	(—)	(—)	(—)	(5)	(—)	(—)	(3)	(1)	(—)	(11)	(10)
Santalpur	57	—	4	—	29	—	—	1	—	—	—	—	1	—	—	3	4	—	9	6
		(—)	(7)	(—)	(50)	(—)	(—)	(2)	(—)	(—)	(—)	(—)	(2)	(—)	(—)	(5)	(8)	(—)	(16)	(10)
Dhanera	95	—	14	—	56	—	—	6	—	—	—	—	5	—	—	2	—	—	3	9
		(—)	(15)	(—)	(59)	(—)	(—)	(6)	(—)	(—)	(—)	(—)	(5)	(—)	(—)	(2)	(—)	(—)	(3)	(10)
Radhanpwe	45	—	6	—	18	—	—	3	—	—	—	—	0·3	—	—	1	5	—	12	—
		(—)	(13)	(—)	(40)	(—)	(—)	(7)	(—)	(—)	(—)	(—)	(1)	(—)	(—)	(2)	(11)	(—)	(26)	(—)
Kankruj	75	—	16	—	28	—	—	7	—	—	—	—	2	—	—	1	3	—	6	12
		(—)	(21)	(—)	(38)	(—)	(—)	(9)	(—)	(—)	(—)	(—)	(3)	(—)	(—)	(1)	(4)	(—)	(8)	(16)
	Rainfall Zone—IV														*Rainfall Pattern—$E_4(C_2D_2)E_4$*					
Surendranagar																				
Sayla	56	—	9	—	18	—	—	1	—	—	—	—	1	—	9	3	10	—	4	1
		(—)	(16)	(—)	(32)	(—)	(—)	(2)	(—)	(—)	(—)	(—)	(2)	(—)	(16)	(5)	(18)	(—)	(7)	(2)
Dasada	108	—	25	—	9	—	—	1	—	—	—	—	1	—	9	3	10	—	4	
		(—)	(23)	(—)	(8)	(—)	(—)	(2)	(—)	(—)	(—)	(—)	(2)	(—)	(16)	(5)	(18)	(—)	(7)	(21)

Linildi	121	1 (1)	22 (29)	— (—)	16 (13)	— (—)	— (—)	12 (10)	— (—)	— (—)	— (—)	— (—)	2 (1)	— (—)	5 (4)	— (—)	58 (48)	— (—)	3 (2)	2 (2)
Wadhwan	63	— (—)	9 (14)	— (—)	11 (18)	— (—)	— (—)	1 (1)	— (—)	— (—)	— (—)	— (—)	0·4 (1)	— (—)	10 (16)	— (—)	31 (49)	— (—)	— (—)	0·6 (1)
Muli	57	— (—)	6 (11)	— (—)	14 (25)	— (—)	— (—)	1 (2)	— (—)	— (—)	— (—)	— (—)	1 (2)	— (—)	9 (15)	2 (3)	20 (35)	— (—)	3 (5)	1 (2)
Bhavnagar																				
Umrala	22	— (—)	1 (5)	— (—)	10 (45)	— (—)	— (—)	0·4 (2)	— (—)	— (—)	— (—)	— (—)	— (—)	0·4 (2)	5 (23)	1 (5)	3 (14)	— (—)	— (—)	1 (4)
Godhada	59	— (—)	10 (16)	0·4 (1)	19 (32)	— (—)	— (—)	3 (5)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	15 (25)	3 (5)	7 (12)	— (—)	1 (2)	0·6 (2)
Sehor	43	— (—)	9 (22)	— (—)	16 (38)	— (—)	— (—)	1 (2)	— (—)	— (—)	— (—)	— (—)	— (—)	1 (2)	10 (23)	1 (2)	3 (7)	— (—)	1 (2)	— (—)
Vallabhipur	40	— (—)	18 (45)	— (—)	6 (15)	— (—)	— (—)	9 (22)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	1 (2)	— (—)	2 (6)	— (—)	3 (8)	1 (2)
		Rainfall Zone—V		..		..		..		..		..		..	*Rainfall Pattern—$E_4(B_1C_1E_2)E_4$*					
Jamnagar																				
Bhanvad	47	— (—)	2 (5)	— (—)	2 (4)	— (—)	— (—)	2 (5)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	38 (79)	— (—)	— (—)	— (—)	1 (3)	2 (4)
Jamjodhpur	62	— (—)	2 (3)	— (—)	4 (6)	— (—)	— (—)	2 (3)	— (—)	— (—)	— (—)	— (—)	— (—)	0·4 (1)	50 (80)	— (—)	1 (2)	— (—)	1 (2)	2 (3)
Kalavad	87	— (—)	7 (8)	— (—)	9 (10)	— (—)	— (—)	4 (5)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	61 (70)	— (—)	— (—)	— (—)	1 (1	5 (6)
Khambhaliya	78	— (—)	16 (20)	— (—)	13 (17)	— (—)	— (—)	2 (3)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	42 (54)	1 (1)	1 (1)	— (—)	1 (1)	(2) (3)
Lalpur	63	— (—)	16 (25)	— (—)	8 (12)	— (—)	— (—)	2 (3)	— (—)	— (—)	— (—)	— (—)	— (—)	0·3 (1)	34 (53)	1 (2)	— (—)	— (—)	1 (2)	1 (2)
Jamnagar	71	(—) (—)	24 (31)	— (—)	9 (12)	0·3 (1)	— (—)	3 (4)	— (—)	— (—)	— (—)	— (—)	— (—)	0·3 (0·6)	2·5 (35)	— (—)	— (—)	— (—)	2 (3)	1 (4)
Dhrol	40	— (—)	12 (31)	— (—)	5 (12)	— (—)	— (—)	1 (2)	— (—)	— (—)	— (—)	— (—)	— (—)	0·3 (1)	19 (47)	1 (3)	1 (2)	— (—)	0·3 (1)	0·4 (1)
Junagadh																				
Una	68	— (—)	4 (6)	— (—)	29 (43)	— (—)	— (—)	4 (6)	— (—)	— (—)	— (—)	— (—)	1 (1)	4 (6)	20 (29)	2 (3)	2 (3)	— (—)	2 (3)	— (—)
Bhesan	36	4 (1)	2 (5)	— (—)	4 (10)	— (—)	— (—)	2 (6)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	26 (68)	— (—)	0·4 (1)	— (—)	1 (6)	1 (3)
Visavadai	52	1 (2)	3 (6)	— (—)	(15)	— (—)	— (—)	3 (6)	— (—)	— (—)	— (—)	— (—)	— (—)	1 (2)	34 (65)	— (—)	— (—)	— (—)	— (—)	2 (4)
Patan Veraval	48	1 (2)	4 (9)	2 (4)	13 (27)	— (—)	— (—)	1 (2)	— (—)	— (—)	— (—)	— (—)	— (—)	2 (4)	22 (45)	— (—)	— (—)	— (—)	— (—)	2 (4)
Ranavav	25	— (—)	2 (8)	1 (4)	3 (12)	— (—)	— (—)	1 (4)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	13 (52)	— (—)	2 (8)	— (—)	3 (12)	— (—)
Kutiyana	33	— (—)	2 (6)	6 (18)	3 (9)	— (—)	— (—)	0·3 (1)	— (—)	— (—)	0·3 (1)	— (—)	— (—)	— (—)	16 (48)	— (—)	151 (15)	— (—)	— (—)	1 (2)
Porbandar	60	0·3 (1)	— (—)	12 (20)	6 (10)	— (—)	— (—)	3 (5)	— (—)	— (—)	3 (5)	— (—)	— (—)	— (—)	14 (23)	2 (3)	9 (15)	— (—)	9 (15)	2

(000'ha)

District/Taluk	Gross cropped area	pd				M	R	W	Ba	Mt	G	T	Pu	S	Gn	O	C	To	F	Misc.
Amreli		*Rainfall Zone—V* (Contd).																	*Rainfall Pattern— $E_4(B_1C_1E_2)$*	E_4
Kodinar	36	1 (3)	2 (5)	0·3 (—)	13 (36)	— (—)	— (—)	2 (5)	— (—)	— (—)	— (—)	— (—)	0·4 (1)	5 (14)	11 (30)	1 (3)	0·5 (1)	— (—)	— (1)	— (—)
Rajula	61	— (—)	9 (15)	— (—)	24 (39)	— (—)	— (—)	1 (2)	— (—)	— (—)	— (—)	— (—)	1 (2)	— (—)	19 (31)	6 (9)	— (—)	— (—)	— (—)	1 (2)
Jafrabad	24	— (—)	3 (12)	— (—)	12 (50)	— (—)	— (—)	0·4 (2)	— (—)	— (—)	— (—)	— (—)	0·5 (2)	— (—)	4 (17)	4 (17)	— (—)	— (—)	— (—)	— (—)
Kunkavadia	70	1 (1)	7 (10)	— (—)	7 (10)	— (—)	— (—)	2 (2)	— (—)	— (—)	— (—)	— (—)	— (—)	1 (1)	49 (70)	— (—)	2 (3)	— (—)	2 (3)	— (—)
Rajkot																				
Dhoraji	43	0·3 (1)	1 (2)	— (—)	2 (5)	0·2 (1)	— (—)	4 (9)	— (—)	— (—)	— (—)	— (—)	— (—)	1 (2)	30 (70)	— (—)	3 (7)	— (—)	1 (2)	5 (1)
Jetpur	56	1 (2)	3 (5)	— (—)	5 (9)	— (—)	— (—)	4 (8)	— (—)	— (—)	— (—)	— (—)	— (—)	1 (2)	39 (69)	— (—)	1 (2)	— (—)	2 (3)	— (—)
Jamkondorva	43	0·2 (1)	2 (5)	— (—)	3 (7)	— (—)	— (—)	1 (3)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	34 (78)	— (—)	1 (2)	— (—)	1 (2)	— —
Gondal	83	1 (1)	6 (7)	— (—)	6 (7)	— (—)	— (—)	4 (5)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	60 (72)	— (—)	4 (5)	— (—)	— (—)	2 (3)
Lodhika	23	0·2 (1)	3 (13)	— (—)	3 (13)	— (—)	— (—)	0·2 (1)	— (—)	— (—)	— (—)	— (—)	0·1 (1)	— (—)	16 (69)	— (—)	0·3 (1)	— (—)	— (—)	0·2 (1)
Paldhari	44	— (—)	7 (16)	— (—)	5 (12)	— (—)	— (—)	1 (2)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	30 (68)	— (—)	1 (2)	— (—)	— (—)	— (—)
Kotda-Sangahi	29	0·3 (1)	3 (10)	— (—)	3 (10)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	21 (72)	— (—)	2 (6)	— (—)	0·2 (1)	— (—)
Upleta	60	— (—)	2 (3)	— (—)	5 (8)	— (—)	— (—)	3 (5)	— (—)	— (—)	— (—)	— (—)	— (—)	2 (3)	33 (55)	— (—)	11 (19)	— (—)	3 (5)	1 (2)
Rajkot	66	— (—)	10 (15)	— (—)	9 (13)	— (—)	— (—)	1 (2)	— (—)	— (—)	— (—)	— (—)	1 (2)	— (—)	40 (60)	— (—)	2 (3)	— (—)	2 (3)	1 (2)
Jasdan	87	— (—)	13 (15)	— (—)	18 (21)	— (—)	— (—)	6 (7)	— (—)	— (—)	— (—)	— (—)	1 (1)	1 (1)	41 (47)	1 (1)	6 (7)	— (—)	— (—)	— (—)
Morvi	125	— (—)	24 (19)	— (—)	24 (19)	— (—)	— (—)	3 (2)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	38 (30)	1 (1)	34 (28)	— (—)	— (—)	1 (1)
Wankawr	56	— (—)	9 (16)	— (—)	14 (25)	— (—)	— (—)	4 (7)	— (—)	— (—)	— (—)	— (—)	1 (2)	— (—)	22 (39)	1 (1)	5 (9)	— (—)	0·4 (1)	— (—)
Miyana	50	— (—)	12 (24)	— (—)	10 (20)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	4 (8)	1 (2)	23 (46)	— (—)	— (—)	— (—)
Surendranagar																				
Ghotila	58	— (—)	5 (9)	— (—)	19 (33)	— (—)	— (—)	2 (3)	— (—)	— (—)	— (—)	— (—)	2 (3)	— (—)	14 (24)	— (—)	2 (3)	— (—)	13 (23)	1 (2)
Lakhtar	60	— (—)	12 (20)	— (—)	7 (12)	— (—)	— (—)	1 (1)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	1 (1)	— (—)	0·3 (1)	1 (2)
Halwad	83	— (—)	16 (19)	— (—)	19 (23)	— (—)	— (—)	2 (2)	— (—)	— (—)	— (—)	— (—)	1 (1)	— (—)	4 (5)	— (—)	39 (48)	— (—)	— (—)	2 (2)
Dhrangadhra	89	— (—)	20 (22)	— (—)	18 (20)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	1 (1)	— (—)	4 (4)	2 (2)	44 (50)	— (—)	— (—)	1 (1)

		23	—	26	—	—	7	—	3	—	1	3	—	1	11	4	—	5	8
		(25)	(—)	(28)	(—)	(—)	(8)	(—)	(3)	(—)	(1)	(4)	(—)	(1)	(12)	(4)	(—)	(5)	(9)
		17	—	18	—	—	4	—	2	—	1	4	—	0·4	3	—	—	2	9
		(28)	(—)	(30)	(—)	(—)	(7)	(—)	(3)	(—)	(2)	(6)	(—)	(1)	(5)	(—)	(—)	(3)	(15)
	—	17	—	22	—	—	6	—	1	0·1	2	3	0·3	7	6	1	—	3	7
	(—)	(23)	(—)	(28)	(—)	(—)	(8)	(—)	(2)	(0·2)	(2)	(4)	(1)	(10)	(7)	(2)	(—)	(4)	(9)
	0·4	12	—	25	—	—	8	—	2	—	—	3	—	2	3	7	—	5	8
	(1)	(16)	(—)	(33)	(—)	(—)	(10)	(—)	(2)	(—)	(—)	(4)	(—)	(2)	(5)	(9)	(—)	(7)	(11)
40	0·4	9	1	13	0·4	—	5	—	2	—	—	4	1	1	3	—	—	1	—
	(1)	(22)	(3)	(33)	(1)	(—)	(12)	(—)	(5)	(—)	(—)	10)	(2)	(2)	(7)	(—)	(—)	(2)	(—)
141	1	26	—	16	—	—	4	—	—	—	—	1	—	4	1	82	—	5	1
	(1)	(18)	(—)	(11)	(—)	(—)	(3)	(—)	(—)	(—)	(—)	(—)	(—)	(3)	(1)	(58)	(—)	(4)	(1)
	Rainfall Zone—VI				..				..				..		*Rainfall Pattern—$E_4(B_1C_2E_1)E_4$*					
Bhavnagar																				
Botad	53	—	8	—	18	—	—	2	—	—	1	—	—	—	12	3	5	—	3	1
		(—)	(16)	(—)	(34)	(—)	(—)	(4)	(—)	(—)	(2)	(—)	(—)	(—)	(23)	(5)	(9)	(—)	(5)	(2)
Palitana	37	—	6	—	15	—	—	1	—	—	—	—	1	1	12	—	2	—	—	—
		(—)	(16)	(—)	(40)	(—)	(—)	(3)	(—)	(—)	(—)	(—)	(3)	(3)	(32)	(—)	(5)	(—)	(—)	(—)
Bhavnagar	33	—	14	—	8	—	—	2	—	—	—	—	—	—	5	1	1	—	—	2
		(—)	(43)	(—)	(23)	(—)	(—)	(6)	(—)	(—)	(—)	(—)	(—)	(—)	(17)	(2)	(3)	(—)	(—)	(6)
Ghogha	28	—	6	—	8	—	—	1	—	—	—	—	1	—	10	1	—	—	0·3	1
		(—)	(22)	(—)	(29)	(—)	(—)	(3)	(—)	(—)	(—)	(—)	(3)	(—)	(37)	(2)	(—)	(—)	(1)	(3)
Talaya	68	0·4	7	—	23	—	—	4	—	—	—	—	1	1	27	1	—	—	2	2
		(1)	(11)	(—)	(33)	(—)	(—)	(6)	(—)	(—)	(—)	(—)	(1)	(1)	(39)	(2)	(—)	(—)	(2)	(4)
Mahuva	87	—	7	—	30	—	—	2	—	—	—	—	2	—	40	2	—	—	1	3
		(—)	(8)	(—)	(33)	(—)	(—)	(3)	(—)	(—)	(—)	(—)	(3)	(—)	(46)	(3)	(—)	(—)	(1)	(3)
Mehsana																				
Vijapur	100	—	—	—	38	—	—	16	—	1	—	1	5	—	6	8	2	—	11	12
		(—)	(—)	(—)	(38)	(—)	(—)	(16)	(—)	(1)	(—)	(1)	(5)	(—)	(6)	(8)	(2)	(—)	(11)	(12)
Visnagar	52	—	12	—	17	—	—	5	—	0·4	—	1	2	—	—	4	1	—	2	8
		(—)	(23)	(—)	(33)	(—)	(—)	(9)	(—)	(1)	(—)	2)	(4)	(—)	(—)	(8)	(2)	(—)	(4)	(14)
Kalol	45	3	4	—	13	—	—	6	—	—	—	1	1	—	—	2	7	—	4	4
		(7)	(10)	(—)	(28)	(—)	(—)	(13)	(—)	(—)	(—)	(1)	(2)	(—)	(—)	(4)	(15)	(—)	(10)	(10)
Kadi	76	5	10	—	20	—	—	7	—	0·4	—	—	1	—	1	2	22	—	6	2
		(6)	(13)	(—)	(26)	(—)	(—)	(9)	(—)	(1)	(—)	(—)	(1)	(—)	(1)	(3)	(29)	(—)	(8)	(3)
Ahmedabad																				
Dehgam	54	1	3	—	22	—	—	3	—	2	—	1	3	—	10	1	4	—	2	2
		(2)	(6)	(—)	(41)	(—)	(—)	(5)	(—)	(4)	(—)	(2)	(5)	(—)	(18)	(2)	(7)	(—)	(4)	(4)
Dhanduka	164	—	32	1	14	—	—	32	—	2	1	—	1	—	—	8	57	—	15	1
		(—)	(19)	(—)	(9)	(—)	(—)	(19)	(—)	(1)	(—)	(—)	(1)	(—)	(—)	(5)	(35)	(—)	(10)	(1)
Dholka	132	9	14	—	6	—	—	31	—	—	1	—	1	—	—	1	57	—	8	4
		(7)	(11)	(—)	(5)	(—)	(—)	(23)	(—)	(—)	(1)	(—)	(1)	(—)	(—)	(—)	(43)	(—)	(6)	(3)
Sanand	61	10	8	—	4	—	—	6	—	—	—	—	—	—	—	—	27	—	5	1
		(16)	(13)	(—)	(7)	(—)	(—)	(10)	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(44)		(8)	(2)
Vododra																				
Jambugam	49	6	0·4	7	1	3	—	0·3	—	3	—	2	1	—	5	—	14	—	—	7
		(12)	(1)	(14)	(2)	(6)	(—)	(1)	(—)	(6)	(—)	(4)	(2)	(—)	(10)	(—)	(29)	(—)	(—)	(14)

APPENDIX 4 (*Contd*)

(Thousand hectars)

District/taluk	Gross cropped area	Pd	Jk	Jr	B	M	R	W	Ba	Mt	G	T	Pu	S	Gn	O	C	To	F	Misc
	Rainfall Zone—VI (Contd.)					..				..		..				*Rainfall Pattern*			$E_4(B_1C_2E_1)E_4$	
Gandhinagar																				
Gandhinagar	58	1 (2)	7 (12)	— (—)	22 (38)	— (—)	— (—)	5 (8)	0·3 (1)	— (—)	— (—)	1 (2)	3 (5)	— (—)	1 (2)	2 (3)	8 (14)	— (—)	3 (5)	5 (8)
Kheda																				
Cambay	70	7 (10)	5 (7)	— (—)	15 (21)	— (—)	— (—)	17 (24)	— (—)	2 (3)	— (—)	1 (2)	1 (1)	— (—)	— (—)	1 (1)	14 (20)	— (—)	4 (7)	3 (4)
	Rainfall Zone—VII					..				..			..			*Rainfall Pattern—*			$E_4(B_2E_2)E_4$	
Banaskantha																				
Deesa	136	— (—)	22 (16)	— (—)	59 (44)	— (—)	— (—)	8 (6)	— (—)	1 (1)	— (—)	— (—)	5 (4)	— (—)	— (—)	3 (3)	— (—)	— (—)	1 (1)	37 (25)
Palanpur	91	— (—)	16 (17)	1 (1)	28 (31)	4 (5)	— (—)	6 (6)	— (—)	6 (6)	— (—)	— (—)	5 (6)	— (—)	1 (1)	4 (5)	— (—)	— (—)	16 (17)	4 (5)
Danta	23	1 (3)	1 (4)	— (—)	2 (8)	7 (32)	— (—)	2 (9)	— (—)	3 (12)	0·4 (2)	1 (4)	0·4 (2)	— (—)	0·4 (2)	1 (7)	1 (5)	— (—)	3 (10)	— (—)
Sabarkantha																				
Khedbrahma	39	1 (3)	2 (5)	— (—)	— (—)	14 (36)	— (—)	2 (5)	— (—)	1 (3)	0·3 (1)	— (—)	0·4 (1)	0·4 (1)	1 (3)	3 (7)	11 (28)	— (—)	— (—)	3 (7)
	Rainfall Zone—VIIII					..				..			..			*Rainfall Pattern—*			$E_4(B_2C_2)E_4$	
Panchmahals																				
Shehera	29	4 (13)	0·2 (1)	0·3 (1)	8 (26)	5 (17)	4 (14)	0·2 (1)	— (—)	3 (10)	— (—)	1 (3)	— (—)	— (—)	2 (7)	0·3 (1)	0·4 (2)	— (—)	— (—)	1 (4)
Limkheda	47	10 (22)	— (—)	— (—)	— (—)	20 (44)	1 (1)	1 (1)	— (—)	3 (7)	3 (7)	1 (1)	2 (4)	— (—)	5 (11)	— (—)	— (—)	— (—)	— (—)	1 (2)
Dohad	55	5 (9)	2 (4)	— (—)	— (—)	27 (49)	1 (2)	4 (7)	0.4 (1)	4 (8)	6 (10)	1 (2)	1 (1)	— (—)	3 (6)	1 (1)	— (—)	— (—)	— (—)	— (—)
	58	13 (22)	1 (2)	— (—)	9 (16)	12 (20)	4 (7)	1 (2)	— (—)	2 (4)	0·4 (1)	1 (2)	0·4 (1)	— (—)	8 (14)	1 (1)	4 (6)	— (—)	— (—)	1 (2)
	58	13 (22)	1 (2)	— (—)	9 (16)	12 (20)	4 (7)	1 (2)	— (—)	2 (4)	0·4 (1)	1 (2)	0·4 (1)	— (—)	8 (14)	1 (1)	4 (6)	— (—)	— (—)	1 (2)
	62	5 (9)	— (—)	7 (12)	5 (8)	— (—)	— (—)	1 (2)	— (—)	4 (6)	— (—)	1 (2)	— (—)	— (—)	2 (3)	— (—)	26 (41)	9 (14)	2 (3)	— (—)
		0·3 (1)	2 (4)	1 (2)	2 (5)	— (—)	— (—)	2 (3)	— (—)	— (—)	— (—)	— (—)	— (—)	0·3 (1)	32 (67)	— (—)	5 (11)	— (—)	3 (6)	— (—)
		1 (1)	— (—)	1 (2)	1 (2)	— (—)	— (—)	3 (6)	— (—)	— (—)	— (—)	— (—)	— (—)	0·2 (1)	32 (73)	0·3 (1)	1 (2)	— (—)	4 (9)	1 (2)
			1 (3)	1 (3)	4 (10)	— (—)	— (—)	2 (5)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	25 (71)	— (—)	— (—)	— (—)	0·4 (1)	2 (6)
			1 (1)	0·2 (1)	2 (8)	— (—)	— (—)	2 (6)	— (—)	— (—)	— (—)	— (—)	— (—)	1 (3)	20 (74)	0·2 (1)	0·4 (1)	— (—)	1 (3)	— (—)

Mendarda	24	0·3	—	—	1	—	—	2	—	—	—	—	—	—	19	—	0·4	—	1	1
		(1)	(—)	(—)	(3)	(—)	(—)	(10)	(—)	(—)	(—)	(—)	(—)	(—)	(78)	(—)	(2)	(—)	(3)	(3)
Vanthali	31	0·4	1	0·2	2	—	—	3	—	—	—	—	—	0·3	20	—	3	—	—	1
		(2)	(3)	(1)	(7)	(—)	(—)	(9)	(—)	(—)	(—)	(—)	(—)	(1)	(65)	(—)	(9)	(—)	(—)	(3)
Junagadh	39	1	1	—	3	1	—	3	—	—	—	—	—	—	25	—	3	—	—	2
		(3)	(3)	(—)	(8)	(2)	(—)	(9)	(—)	(—)	(—)	(—)	(—)	(—)	(62)	(—)	(8)	(—)	(—)	(5)
Mangrol	42	0·4	3	2	2	—	—	2	—	—	—	—	—	—	22	—	3	—	3	5
		(1)	(7)	(5)	(5)	(—)	(—)	(5)	(—)	(—)	(—)	(—)	(—)	(—)	(52)	(—)	(7)	(—)	(7)	(11)
Surat																				
Ghoraoi	29	1	12	0·4	1	—	—	1	—	—	—	1	1	—	2	1	5	—	0·4	3
		(3)	(41)	(2)	(3)	(—)	(—)	(3)	(—)	(—)	(—)	(3)	(3)	(—)	(7)	(3)	(18)	(—)	(2)	(11)
Olpad	39	2	12	0·3	1	—	—	2	—	—	—	1	0·4	—	2	1	18	—	—	—
		(4)	(30)	(1)	(2)	(—)	(—)	(5)	(—)	(—)	(—)	(3)	(1)	(—)	(6)	(3)	(45)	(—)	(—)	(—)
Bharrich																				
Amod	37	1	—	5	—	—	—	1	—	—	—	0·2	2	—	—	—	27	—	—	1
		(3)	(—)	(13)	(—)	(—)	(—)	(3)	(—)	(—)	(—)	(1)	(5)	(—)	(—)	(—)	(72)	(—)	(—)	(3)
Jambusar	67	2	—	6	3	—	—	1	—	1	—	1	—	—	—	3	41	—	9	—
		(3)	(—)	(9)	(4)	(—)	(—)	(2)	(—)	(2)	(—)	(2)	(—)	(—)	(—)	(4)	(61)	(—)	(13)	(—)
Vyara	51	—	1	11	0·4	—	—	3	—	—	—	—	3	—	—	—	29	—	3	1
		(—)	(2)	(21)	(1)	(—)	(—)	(6)	(—)	(—)	(—)	(—)	(6)	(—)	(—)	(—)	(56)	(—)	(6)	(2)
Broach	50	1	—	6	—	—	—	1	—	—	—	1	4	—	—	—	34	—	1	2
		(2)	(—)	(12)	(—)	(—)	(—)	((2)	(—)	(—)	(—)	(2)	(8)	(—)	(—)	(—)	(58)	(—)	(2)	(4)
Hansat	22	0·3	4	2	0·2	—	—	1	—	—	—	2	0·3	—	1	—	13	—	—	—
		(2)	(18)	(8)	(1)	(—)	(—)	(4)	(—)	(—)	(—)	(1)	(2)	(—)	(4)	(—)	(59)	(—)	(—)	(—)
Ankleshwar	30	0·4	5	5	—	—	—	1	—	—	—	1	—	—	1	0.4	15	—	0·2	1
		(1)	(17)	(17)	(—)	(—)	(—)	(3)	(—)	(—)	(—)	(3)	(—)	(—)	(4)	(1)	(50)	(—)	(1)	(3)
		Rainfall Zone—X				..			..				..			*Rainfall Pattern—$E_4(A_1B_1C_1E_1)E_4$*				
Mehmedabad	44	11	—	—	16	—	2	4	—	2	1	2	1	—	—	1	1	—	2	1
		(25)	(—)	(—)	(36)	(—)	(4)	(9)	(—)	(6)	(2)	(4)	(2)	(—)	(—)	(2)	(2)	(—)	(6)	(2)
Nadiad	66	11	3	—	22	—	2	7	—	3	0·3	1	1	—	1	1	1	7	3	3
		(16)	(4)	(—)	(33)	(—)	(2)	(10)	(—)	(5)	(1)	(1)	(1)	(—)	(1)	(2)	(1)	(11)	(6)	(6)
Kapadvanj	79	4	1	0.4	21	4	1	2	—	2	—	1	1	—	20	1			—	4
		(5)	(1)	(1)	(26)	(5)	(1)	(3)	(—)	(3)	(—)	(1)	(1)	(—)	(25)	(1)	(21)	(—)	(—)	(5)
Sabarkantha																				
Vijaynagar	12	2	0.2	—	—	6	—	1	0·2	0.3	0.4	—	0.4	—	0·2	0.2	0·4	—	1	—
		(16)	(1)	(—)	(—)	(49)	(—)	(8)	(2)	(3)	(3)	(—)	(3)	(—)	(2)	(2)	(3)	(—)	(8)	(—)
Bhiloda	40	3	2	—	2	12	—	3	—	2	1	0·4	1	0·2	5	1	6	—	1	1
		(8)	(5)	(—)	(5)	(30)	(—)	(7)	(—)	(5)	(2)	(1)	(2)	(1)	(12)	(3)	(14)	—	(3)	(2)
Meghraj	34	5	1	—	4	10	0·2	1	—	2	—	1	—	—	3	2	4	—	0.4	1
		(15)	(3)	(—)	(12)	(28)	(1)	(3)	(—)	(7)	(—)	(1)	(—)	(—)	(8)	(6)	(12)	(—)	(1)	(3)
Prautij	68	2	3	—	18	1	—	4	—	1	0.4	1	2	—	25	2	5	—	1	3
		(3)	(4)	(—)	(26)	(1)	(—)	(6)	(—)	(1)	(1)	(1)	(3)	(—)	(37)	(3)	(8)	(—)	(1)	(5)
Himatnagar	56	1	4	—	8	3	—	3	—	1	—	0.3	0.4	—	16	2	15	—	1	2
		(2)	(6)	(—)	(13)	(6)	(—)	(6)	(—)	(2)	(—)	(1)	(1)	(—)	(29)	(2)	(27)	(—)	(2)	(3)
Modaja	66	2	2	—	10	10	—	3	—	1	—	1	0·4	—	18	3	13	—	2	1
		(3)	(3)	(—)	(15)	(15)	(—)	(5)	(—)	(2)	(—)	(1)	(1)	(—)	(27)	(4)	(20)	(—)	(3)	(1)
Malpur	23	2	—	—	4	4	—	1	—	1	—	0·2	0·2	—	6	1	2	—	0·4	2
		(8)	(—)	(—)	(17)	(17)	(—)	(4)	(—)	(4)	(—)	(1)	(1)	(—)	(26)	(4)	(8)	(—)	(2)	(8)
Bagad	64	2	0·3	—	9	9	—	2	—	1	—	0·4	0·4	—	17	2	17	—	3	1
		(3)	(1)	(—)	(14)	(14)	(—)	(3)	(—)	(2)	(—)	(1)	(1)	(—)	(26)	(3)	(26)	(—)	(5)	(1)
Idar	95	2	7	—	6	11	—	7	0·4	2	1	0·4	1	—	16	3	29	—	7	4
		(2)	(7)	(—)	(6)	(12)	(—)	(7)	(0·4)	(6)	(1)	(1)	(1)	(—)	(17)	(3)	(30)	(—)	(7)	(4)

(000'ha)

District/taluk	Gross cropped area	Pd	Jk	Jr	B	M	R	W	Ba	Mt	G	T	Pu	S	Gn	O	C	To	F	Misc.
	Rainfall Zone—X (Contd.)																*Rainfall Pattern—$E_4(A_1B_1C_1E_1)E_4$*			
Ahmedabad																				
Ahmedabad	10	2 (20)	1 (10)	— (—)	2 (20)	— (—)	— (—)	1 (10)	— (—)	— (—)	0·1 (1)	0·1 (1)	0·1 (1)	— (—)	— (—)	— —	1 (10)	— (—)	21 (20)	0·7 (7)
Daskray	57	14 (25)	9 (16)	— (—)	16 (28)	— (—)	— (—)	7 (11)	— (—)	1 (2)	1·4 (1)	1 (2)	0·4 (1)	— (—)	— (—)	1 (2)	6 (10)	— (—)	— (—)	1 (2)
	Rainfall Zone—XI																*Rainfall Pattern $E_4(A_1B_1C_2)E_4$*			
Kheda																				
Matar	46	16 (35)	2 (5)	— (—)	5 (10)	— (—)	1 (2)	6 (13)	— (—)	1 (2)	1 (1)	1 (2)	1 (2)	— (—)	— —	1 (3)	5 (10)	2 (5)	2 (5)	2 (5)
Borsad	51	6 (12)	1 (2)	1 (2)	15 (29)	— (—)	0·4 (1)	1 (2)	— (—)	8 (15)	— (—)	1 (2)	2 (4)	— (—)	— (—)	1 (2)	— (—)	11 (21)	2 (4)	2 (4)
Petlad	50	7 (14)	0·4 (1)	— (—)	22 (44)	— (—)	1 (2)	2 (4)	— (—)	4 (8)	— (—)	1 (2)	— (—)	— (—)	— (—)	2 (4)	1 (2)	7 (14)	— (—)	3 (5)
Jhasra	53	9 (16)	5 (9)	— (—)	9 (17)	1 (2)	1 (2)	1 (2)	— (—)	2 (5)	— (—)	1 (2)	1 (2)	— (—)	1 (2)	1 (2)	11 (20)	7 (13)	2 (4)	1 (2)
Balasinar	37	4 (10)	1 (2)	— (—)	6 (16)	6 (16)	1 (3)	0·3 (1)	— (—)	1 (3)	— (—)	1 (2)	— (—)	— (—)	4 (11)	1 (3)	10 (27)	1 (3)	1 (3)	— —
Anand	63	7 (11)	1 (2)	— (—)	15 (23)	— (—)	— (—)	3 (5)	— (—)	4 (7)	— —	2 (3)	— (—)	— (—)	— (—)	1 (2)	— (—)	23 (36)	2 (3)	5 (8)
Panchmahals																				
Santrampur	75	23 (30)	2 (2)	— (—)	2 (3)	25 (34)	3 (4)	2 (2)	— (—)	6 (8)	5 (6)	1 (2)	1 (2)	— (—)	2 (3)	1 (2)	1 (1)	— (—)	— (—)	1 (1)
Godhra	64	15 (23)	1 (2)	1 (2)	6 (10)	13 (20)	4 (6)	1 (2)	— (—)	5 (7)	1 (2)	1 (2)	2 (2)	— (—)	5 (8)	1 (2)	6 (8)	1 (2)	— (—)	1 (2)
Devgadhbaria	60	11 (18)	1 (2)	1 (2)	3 (5)	17 (28)	2 (3)	1 (2)	— (—)	9 (15)	4 (6)	2 (3)	0·4 (1)	— (—)	6 (7)	— (—)	4 (6)	— (—)	— (—)	— (—)
Kalol	29	6 (20)	— (—)	1 (3)	4 (15)	1 (5)	0·4 (2)	1 (2)	— (—)	4 (13)	— (—)	1 (2)	— (—)	— (—)	8 (27)	— (—)	3 (11)	— (—)	— —	— (—)
Halol	33	6 (18)	1 (4)	3 (9)	2 (6)	2 (6)	— (—)	— (—)	— (—)	3 (9)	— (—)	1 (3)	— (—)	— (—)	5 (15)	— (—)	9 (27)	— (—)	— (—)	1 (3)
Bharuch																				
Sagbara	27	6 (22)	1 (4)	9 (33)	— (—)	— (—)	— (—)	1 (4)	— (—)	2 (7)	— (—)	2 (7)	— (—)	— (—)	0·4 (1)	— (—)	4 (15)	— —	— (—)	2 (7)
Jagadia	45	2 (5)	3 (6)	10 (23)	1 (2)	— (1)	— (—)	0·3 (1)	— (—)	0·4 (1)	1 (2)	2 (4)	— (—)	— (—)	2 (4)	— (—)	22 (48)	— —	1 (2)	1 (2)
Valia	37	4 (12)	5 (15)	4 (11)	— (—)	— (—)	— (—)	0·2 (1)	— (—)	— (—)	1 (2)	1 (2)	— (—)	— (—)	3 (6)	— (—)	18 (48)	— —	— (—)	1 (3)
Dediapada	23	4 (17)	4 (17)	2 (9)	— (—)	0·4 (2)	— (—)	— (—)	— (—)	3 (13)	2 (8)	1 (5)	— (—)	— (—)	0·4 (2)	0·4 (2)	5 (21)	— (—)	— (—)	1 (5)
Surat																				
Mangrol	54	5 (9)	18 (33)	2 (3)	— (—)	— (—)	0·3 (1)	— (—)	— (—)	2 (4)	— (—)	2 (4)	— (—)	— (—)	5 (9)	1 (2)	16 (29)	— (—)	— (—)	(3) (6)

Vadodara																				
Sinor	23	2 (9)	— (—)	3 (13)	— (—)	— (—)	— (—)	1 (4)	— (—)	— (—)	— (—)	1 (4)	— (—)	— (—)	— (—)	— (—)	16 (70)	— (—)	— (—)	— (—)
Dabhoi	51	5 (10)	— (—)	6 (12)	1 (2)	— (—)	— (—)	2 (4)	— (—)	— (—)	— (—)	1 (2)	— (—)	— (—)	1 (2)	— (—)	35 (68)	— (—)	— (—)	— (—)
Karjan	50	2 (4)	— (—)	5 (10)	— (—)	— (—)	— (—)	1 (2)	— (—)	— (—)	— (—)	1 (2)	1 (2)	— (—)	— (—)	— (—)	37 (74)	— (—)	1 (2)	2 (4)
Waghodia	43	6 (14)	— (—)	5 (12)	1 (2)	— (—)	— (—)	0·4 (1)	— (—)	1 (2)	— (—)	1 (2)	— (—)	— (—)	2 (5)	— (—)	26 (60)	— (—)	— (—)	1 (2)
Vadodara																				
Padra	42	3 (7)	— (—)	3 (7)	5 (11)	— (—)	— (—)	1 (3)	— (—)	3 (7)	1 (3)	1 (3)	1 (3)	— (—)	— (—)	1 (3)	16 (38)	3 (7)	2 (4)	2 (4)
	Rainfall Zone—XII					..		..		..				*Rainfall Pattern—$E_4(A_2B_1C_1)E_4$*						
Vadodara																				
Savli	52	5 (9)	— (—)	7 (13)	2 (4)	— (—)	— (—)	0·4 (1)	— (—)	1 (2)	— (—)	1 (2)	1 (2)	— (—)	2 (4)	— (—)	31 (59)	— (—)	— (—)	2 (4)
Tilakwada	18	1 (5)	— (—)	4 (22)	2 (11)	— (—)	— (—)	— (—)	— (—)	0·1 (1)	0·1 (1)	1 (5)	— (—)	— (—)	— (—)	— (—)	10 (55)	— (—)	— (—)	— (—)
Naswadi	28	5 (18)	— (—)	4 (14)	1 (4)	2 (7)	— (—)	0·1 (1)	— (—)	0·3 (1)	1 (3)	1 (3)	— (—)	— (—)	1 (3)	— (—)	13 (46)	— (—)	— (—)	— (—)
Chhotaudaipur	62	7 (11)	4 (6)	3 (5)	0·4 (1)	6 (10)	— (—)	— (—)	— (—)	13 (20)	5 (8)	2 (3)	2 (3)	— (—)	6 (10)	— (—)	11 (18)	— (—)	— (—)	3 (5)
Panch Mahals																				
Jambughoda	7	1·4 (21)	— (—)	1·4 (21)	0·3 (4)	0·4 (6)	— (—)	— (—)	— (—)	— (—)	— (—)	0·1 (2)	0·3 (4)	— (—)	0·4 (6)	— (—)	1·1 (17)	— (—)	— (—)	1·3 (19)
Surat																				
Sarbadhe	41	8 (20)	5 (13)	2 (4)	— (—)	— (—)	2 (6)	0·4 (1)	— (—)	8 (18)	3 (7)	2 (5)	— (—)	— (—)	4 (10)	— (—)	5 (11)	— (—)	— (—)	2 (5)
Vyara	47	11 (23)	9 (20)	1 (1)	— (—)	— (—)	— (—)	1 (2)	— (—)	2 (5)	3 (6)	2 (4)	2 (4)	— (—)	7 (15)	— (—)	8 (18)	— (—)	— (—)	1 (2)
Patsana	15	2 (13)	3 (19)	— (—)	— (—)	— (—)	— (—)	0·4 (3)	— (—)	— (—)	0·1 (1)	0·4 (3)	0·4 (3)	— (—)	1 (6)	0·1 (1)	3 (19)	— (—)	— (—)	5 (32)
Mahuva	24	5 (21)	6 (25)	— (—)	— (—)	— (—)	— (—)	0·3 (1)	— (—)	— (—)	0·4 (2)	1 (4)	2 (8)	1 (4)	3 (13)	— (—)	5 (21)	— (—)	— (—)	0·3 (1)
Valod	17	3 (18)	4 (23)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	1 (6)	0·4 (2)	1 (6)	— (—)	2 (11)	— (—)	4 (23)	— (—)	— (—)	2 (11)
Mandvi	39	6 (15)	13 (33)	1 (3)	— (—)	— (—)	— (—)	1 (3)	— (—)	1 (3)	2 (4)	1 (3)	1 (3)	— (—)	3 (8)	— (—)	10 (25)	— (—)	— (—)	— (—)
Nizar	33	1 (5)	1 (4)	17 (52)	— (—)	— (—)	— (—)	3 (8)	— (—)	— (—)	2 (5)	1 (3)	1 (3)	— (—)	4 (13)	1 (2)	— (—)	— (—)	— (—)	2 (5)
Dediapada	13	2 (15)	1 (7)	3 (23)	— (—)	— (—)	— (—)	— (—)	— (—)	2 (15)	1 (7)	1 (7)	1 (7)	— (—)	0·4 (4)	— (—)	2 (15)	— (—)	— (—)	— (—)
Kamrej	26	2 (8)	6 (21)	— (—)	— (—)	— (—)	1 (4)	— (—)	— (—)	— (—)	0·2 (1)	0·4 (1)	1 (4)	1 (4)	2 (8)	1 (4)	10 (35)	— (—)	— (—)	4 (10)
Bardoli	29	6 (21)	4 (14)	— (—)	— (—)	— (—)	— (—)	1 (3)	— (—)	— (—)	0·4 (1)	1 (3)	4 (14)	3 (11)	1 (3)	0·4 (1)	6 (22)	— (—)	— (—)	2 (7)

APPENDIX 4 (*Concld.*)

(000'la)

District/taluk	Gross cropped area	Pd	Jk	Jr	B	M	R	W	Ba	Mt	G	T	Pu	S	Gn	O	C	To	F	Misc.
	Rainfall Zone—XIII						..			..			..			*Rainfall Pattern—$E_4(A_2B_2)E_4$*				
Valsad																				
Gandevi	13	5	2	—	—	—	—	0·3	—	—	0·1	0·1	1	1	—	0·2	1	—	—	3
		(36)	(15)	(—)	(—)	(—)	(—)	(2)	(—)	(—)	(1)	(1)	(7)	(7)	(—)	(1)	(7)	(—)	(—)	(23)
Chikhli	33	15	4	—	—	—	1	1	—	0·4	1	1	4	—	1	—	2	—	—	3
		(45)	(12)	(—)	(—)	(—)	(3)	(3)	(—)	(1)	(3)	(3)	(12)	(—)	(3)	(—)	(6)	(—)	(—)	(9)
Bansda	24	10	4	—	—	—	3	0·2	—	0·4	1	1	2	—	2	—	1	—	—	—
		(41)	(16)	(—)	(—)	(—)	(12)	(1)	(—)	(2)	(4)	(4)	(8)	(—)	(8)	(—)	(4)	(—)	(—)	(—)
Navsari	39	8	9	—	—	—	—	1	—	—	0·3	1	4	1	1	0·4	10	—	—	4
		(21)	(24)	(—)	(—)	(—)	(—)	(2)	(—)	(—)	(1)	(2)	(8)	(2)	(2)	(1)	(25)	(—)	(—)	(10)
	Rainfall Zone—XIV						..			..			..			*Rainfall Pattern $E_4(A_3B_1)E_4$*				
Valsad																				
Umbergaon	12	10	—	—	—	—	—	0·1	—	0·3	0·1	0·1	0·3	—	—	—	—	—	—	1
		(84)	(—)	(—)	(—)	(—)	(—)	(1)	(—)	(2)	(1)	(1)	(2)	(—)	(—)	(—)	(—)	(—)	(—)	(9)
Pardi	24	14	—	—	—	—	0·4	0·2	—	3	1	0·4	3	0.4	—	—	—		—	2
		(57)	(—)	(—)	(—)	(—)	(2)	(1)	(—)	(12)	(4)	(2)	(12)	(2)	(—)	(—)	(—)	(—)	(—)	(18)
Bulsar	20	10	—	—	—	—	0.3	0.2	—	0.3	0.3	0.2	3	—	—	—	—	—	—	6
		(50)	(—)	(—)	(—)	(—)	(1)	(1)	(—)	(1)	(1)	(1)	(15)	(—)	(—)	(—)	(—)	(—)	(—)	(30)
Dharampur	43	15	—	—	—	—	12	—	—	4	5	3	—	—	—	2	—	—	—	2
		(36)	(—)	(—)	(—)	(—)	(28)	(—)	(—)	(9)	(10)	(7)	(—)	(—)	(—)	(5)	(—)	(—)	(—)	(5)
Dangs																				
Ahwa	46	5	0·4	—	—	0·3	15	—	—	10	3	3	2	—	0·4	7	—	—	—	—
		(10)	(1)	(—)	(—)	(1)	(32)	(—)	(—)	(22)	(7)	(7)	(4)	(—)	(1)	(15)	(—)	(—)	(—)	(—)

ERRATA

Rainfall and Cropping Patterns

Volume IV

GUJARAT

Page No.	Paragraph/Table/ Appendix No.	Line	As printed	As desired
1	2	3	4	5
1	2·1	2	teshil	tehsil
2	2·3(iv)	3	*month*	*moth*
2	2·4	7	A	A_2
2	2·4(ii)	5	months	month
3	2·6	10	Ranifall	Rainfall
3	Table 2	Col. 3 item 17	u	Ju
4	2·11	2	area	areas
4	3·1	col. 1 last line of statement	distficts	districts
4	3·2	14	1·053	1.053
5	Table 4	col. 4 heading	50	upto 50
5	Table 4	col. 9 heading	300	More than 300
6	Table 5	col. 6 heading	tr es	tree
6	3·5	8	Amrel	Amreli
6	3·6	4	Dang.	Dangs.
6	3·7	9	continue	continues
7	3·8	2	13	14
8	4·1	1	divide	divided
8	4·2	Col. 2 of table	Abdasa Rapar Bhachau Lakhpat Bhuj Mandvi	Abdasa Rapar Bhachau Lakhpat Bhuj Mandvi
8	4·2	Col. 1 Row 3 of table	Pu_4 F_7 Jk_4 B_7	Pu_4 F_4 Jk_4 B_4
8	4·2	Col. 2 of table	Nakhatrana Okhamandal (dwarka) Kalyanpur	Nakhatrana Okhamandal (dwarka) Kalyanpur
8	4·3	4	44,000	45,000
9	4·5	8	in kutch to 11 percent, in	in
9	Table 10	Footnote-line 3	& 1970-71	to 1970-71
9	4·11	Col. 3 heading	District	District
10	4·13	5	aout	about
10	4·13	11	Lila	Liliya
10	4·18	Col. 1 Row 1 of Table	B_4 Jk_4 W_4 $O_4/G_4/Gn_4$	B_4 Jk_4 W_4 $O_4/C_4/Gn_4$
11	4·25 statement	Col. 2 line 5-8	Muli Umrala Gadhada Sehar	Muli Umrala Gadhada (Sehor
11	4·26	3	1,634	1,643
12	4·30	7	Yield	Yields
12	4·31-statement	Col. 1-rows 3-6	Gadhada Sihor Sayala Dasada	Gadhada Sihor Sayala Dasada
12	4·32—statement	Col. 2 row 26-29	Kotda Sangani Upleta Rajkot Jasdan	Kotda Sangani Upleta Rajkot Jasdan
13	4·35	5	Inapleta	Upleta
13	4·39—statement	Col. 2	—	The pattern Cm_4 Cf_4 Cy_4 $G_4/S_4/Bf_4$ may be read against Jafrabad taluk also, and the pattern Cm_4 Bf_4 Cf_4 Cy_4 against Patan also.
13	Table 14	Col. 2 last row	155	152
14	4·40	Paragraph no.	404	4·40

1	2	3	4	5
14	4·40	1	comprise	comprises
14	4·40—statement	Col. 1	(Vado or)	(Vadodara)
14	4·40—statement	Col. 2 line 5	deepra mediumda	deep or medium
14	4·40	2 below statement	10-20	by 10-20
14	4·42	6	Month	Months
15	Table 15	Col. 4 row 3	167	137
15	4·47	7	Main	Mainly
15	4·48	7	2 per cent is Khedrahma	42 per cent in Khedrahma
15	4·50	1	2.822	289
15	Table 16	Col. 4 row 1	74	73
15	4·53	Col. 1 row 4	M_4 Pd_4 Gn_4 Mt_4/B_8	M_4 Pd_4 Gn_4 Mt_4/B_4
16	Table 17	Footnote-line 3	& 1970-71	to 1970-71
16	4·60	1	district	districts
16	4·60— statement	Col. 1 row 6	C_5	C_1
17	Table 18	Footnote-line 3	& 1970-71	to 1970-71
17	4·68-statement	Col. 1 row 2	Gn_4 B_4 C Pd_4	Gn_4 B_4 C_4 Pd_4
18	4·70	1	There are no	One to 8 percent of the reporting area is accounted by
18	4·74—statement	Col. 1 leading	Disctrict	District
18	Do.	Col. 1 of table	Kapadvanj Prantiz Himatnagar	Kapadvanj Prantiz Himatnagar
18	Do.	Col. 1 of table	Ahmedabad Daskroi Mehmedabad Nadiad Madasa Malpura Bayad	Ahmedabad Daskroi Mehmedabad Nadiad Madasa Malpura Bayad
18	Table 19	Footnote-line 2	Yielde	Yields
18	Table 19	Footnote-line 3	& 1970-71	to 1970-71
18	4·75—statement	Col. 1, last row	C_3 Jr_5 Pd_4 To_4/Mt_4/(B_4 To_4)	C_3 Jr_4 Pd_4 To_4/Mt_4/(B_4 To_4)
19	4·76	11	Halal	Halol
19	4·76	last	166	66
19	4·79	6	6-7	6-7 per cent each
19	4·80	4	Jowar.	Jowar (kharif).
19	4·81	Col. 1	Valia Jaghodia Santrampur	Valia Jaghodia Santrampur
19	Table 20	Col. 5 row 6	191	181
21	4·92	1	150	more than 150
21	4·95—statement	Col. 1	Navsari Gandevi Chikhli	Navsari Gandevi Chikhli
21	Table 22	Col. heading	area per cent	area
21	4·96—statement	Col. 2	Umbergaon Pardi Valsad	Umbegaon Pardi Valsad
21	4·97	3	about 1,680	over 1,650
22	4·99	2	200	178
22	4·100, col. 2	2	inculdes	includes
22	4·102	1	theis	this
22	5·1	11	coud	could
22	5·1	21	folowing	following
23	5·7	17	occurs in	occurs. In
24	Appendix I Zone I	Col. 9 row 3	10(42)	101(42)
24	Appendix I Zone III	Col. 1, row 3	Saini	Sami
25	Appendix I Zone IV	Col. 9 row 2	8(3)	13(8)
25	Do.	Col. 5 row 9	4(1)	0·4(1)
25	Appendix I Zone V	Col. 10 row 6	68(5)	68(55)
25	Do.	Col. 7 row 8	(15)9	15(9)
25	Do.	Col. 9 row 10	0·4(4)	0·4(0·4)
25	Do.	Col. 6, row 26	4(1)	0·4(1)
25	Do.	Col. 10 row 29	1227(3)	122(73)

1	2	3	4	5
26	Appendix 1 Zone V	Col. 10 row 1	57(45)	57(54)
26	Do.	Col. 7 row 3	7(10)	7(6)
26	Appendix 1 Zone VI	Col. 5, row 11	0·1(1)	0·1 (0·1)
26	Appendix 1 Zone VIII	Subheadings	Rainfall Pattern E_4 (B_6 C_2) E_4	Rainfall Pattern E_4 (B_2 C_2) E_4
26	Do.	Col. 5 last row	(2)3	2(3)
27	Appendix 1 Zone IX	Col. 10 row 2	39(10)	39(70)
27	Do.	Col. 6 row 8	4(1)	0·4(1)
27	Do.	Col. 5 rows 15 & 16	(2)5	2(5)
28	Appendix 1 Zone XII	Col. 6 row 3	4(1)	0·4(1)
28	Do.	Col. 8 row 9	2(1)	0·2(1)
28	Appendix 1 Zone XIV	Col. 7 row 5	0·4(2)	0·4(0·2)
30	Appendix 2 Zone III	Col. 8 row 6	8 (4)	8 (14)
32	Appendix 2	heading col. 9	Go a	Goats
32	Appendix 2 Zone VI	Col. 2 row 10	16 (9)	16 (19)
32	Appendix 2 Zone VI	Col. 1 row 15	Jambnagar	Jambugam
32	Appendix 2 Zone VII	Rainfall Pattern	E_4 (B_2 E_6) E_4	E_4 (B_2 E_2) E_4
33	Appendix 2 Zone IX	Col. 15 row 1	94	49
33	Appendix 2 Zone X	Col. 1 row 2	Nadki (Kheda)	Nadiad
34	Appendix 2 Zone X	subheading	E_4 A_1 (B_1 C_2 E_2) E_4	E_4 (A_1 B_1 C_1 E_1) E_4
35	Appendix 2 Zone XII	Col. 15 line 13	58	28
37	Appendix 3 Zone V	Col. 1 line 6 against Visavadar	Gn_2 W_4/C_4/Jj_4	Gn_2 W_4/C_4/Jr_4
37	Do.	Col. 1 last row	—	C_2 Jk_4
41	Appendix 4 Zone I	Col. 14 row 3	1 (4)	0·1 (4)
41	Do.	Col. 14 row 10	2 (1)	0·2 (1)
41	Appendix 4 Zone II	Last row		The row should be deleted and replaced by the following :
	Lathi 53	neg 9 — 13 — — 1 — — — — neg 0·4 23 1 3 — 1 2 (neg) (17) (—) (24) (—) (—) (2) (—) (—) (—) (—) (neg) (1) (43) (2) (6) (—) (2) (3)		
42	Appendix 4 Zone II	Rainfall Pattern	E_4 (C_1D)^3 E_4	E_4 (C_1 D_3) E_4
42	Do.	Col. 6 row 1	6 (14)	6 (23)
42	Do.	Col. 6 row 16	12 (48)	12 (46)
42	Do.	Col. 6 row 21	6 (28)	6 (23)
42	Do.	Col. 13 row 1	— (1)	— (—)
42	Do.	Col. 4 row 2	(7) (9)	7 (9)
42	Do.	Col. 6 row.2	2 (19)	14 (19)
42	Appendix 4 Zone III	Col. 17 row 1	9 (113)	9 (13)
42	Appendix 4 Zone IV	last row	—	The row should be corrected as below :
	Dasda 108 neg 25 — 9 — — 1 — — — — neg — neg neg 72 — 1 — (neg) (23) (—) (8) (—) (—) (1) (—) (—) (—) (—) (neg) (—) (neg) (neg) (67) (—) (1) (—)			
43	Appendix 4 Zone IV	Col. 1 row 1	Linildi	Limbdi
43	Do.	Col. 4 row 1	22 (29)	22 (19)
43	Appendix 4 Zone V	Col. 21 row 4	(2) (3)	2 (3)
43	Do.	Col. 16 row 6	2·5 (35)	25 (35)
43	Do.	Col. 3 row 9	4 (1)	0·4 (1)
43	Do.	Col. 6 row 10	(15)	8 (15)
43	Do.	Col. 18 row 13	151 (15)	5 (15)

1	2	3	4	5
43	Appendix 4 Zone V	Col. 21 last row	2	2 (3)
44		Col. 5 heading		Jr
44		Col. 6 heading		B
44	Appendix 4 Zone V	Col. 5 row 1	0·3 (—)	0·3 (1)
44	Do.	Col. 9 row 4	2 (2)	(1) (2)
44	Do.	Col. 16 row 19	— (—)	(1) (1)
44	Do.	Col. 18 row 19	1 (1)	38 (63)
46	Appendix 4 Zone VIII	sub-heading	Rainfall Zone VIIII	Rainfall Zone VIII
46	Do.	row 4	—	May be corrected as below : Jhalod 53 8 0.4 — — 19 — 4 0.4 4 6 1 1 — 8 — — — — 1 (16) (1) (—) (—) (35) (—) (7) (1) (7) (12) (2) (2) (—) (15) (—) (—) (—) (—) (2)
46	Appendix 4 Zone IX	Sub-heading	—	Give the following subheadings before district Junagarh Rainfall Zone IX Rainfall Pattern E_4 (A_1 C_3) E_4
47	Do.	Col. 18 row 10	34 (58)	34 (68)
47	Appendix 4 Zone X	Col. 1 row 1	—	add district Kheda before taluk Mehmedabad
47	Do.	Col. 18 row 3	(21)	17 (21)
48	Do.	Col. 12 row 2	1·4 (1)	0·4 (1)
48	Appendix 4 Zone XI	Col. 21 last row	(3) (6)	3 (6)
49	Do.	row 4	—	add the following line against taluk Vadodara 49 5 — 5 4 0.2 — 1 — 2 — — 2 neg — neg — 19 6 2 3 (10) (—) (10) (8) (1) (—) (2) (—) (4) — (4) (neg) (—) (neg) (—) (39) (12) (4) (6)
49	Appendix 4 Zone XIV	Col. 21 row 2	2 (18)	2 (8)

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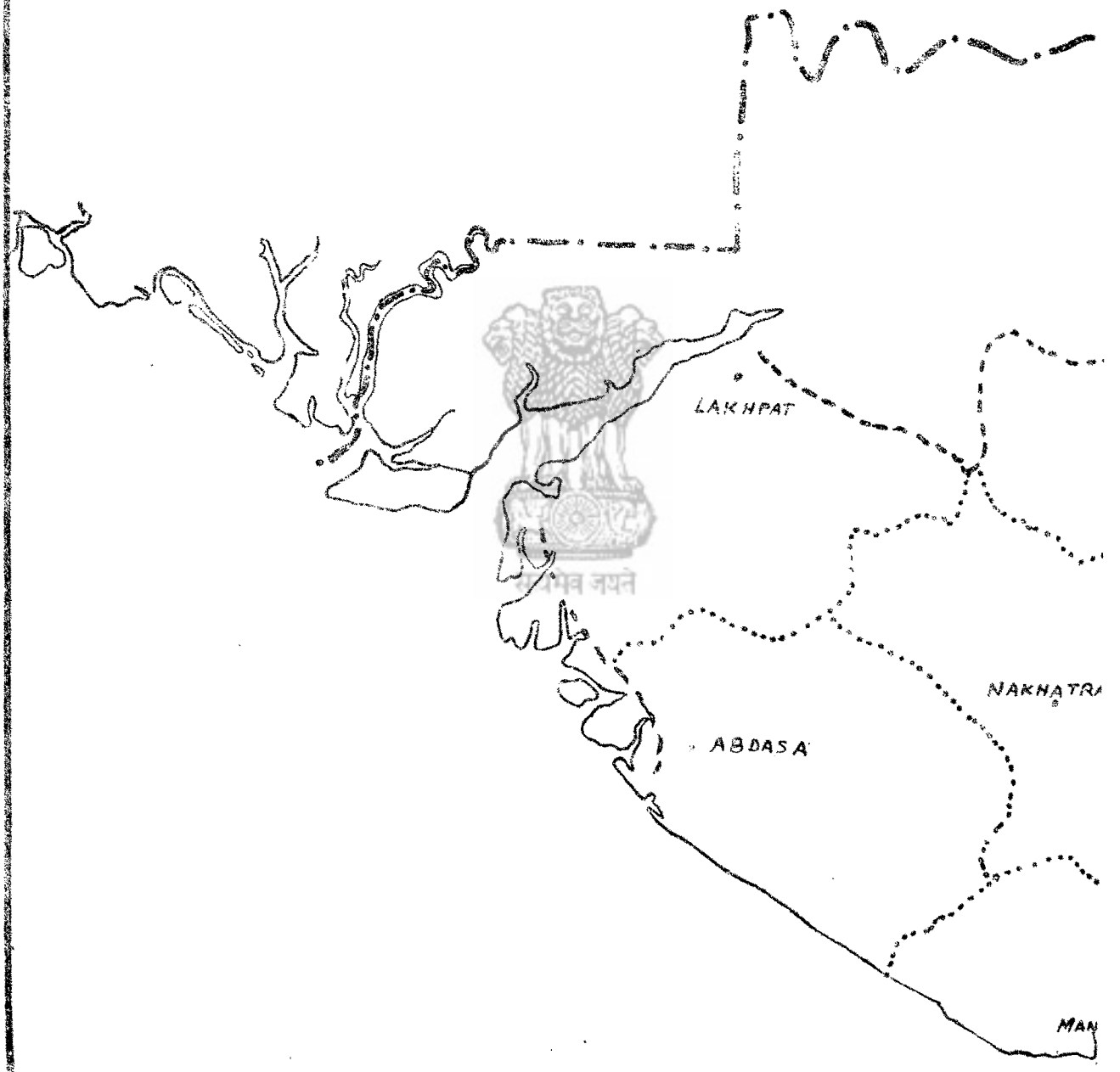
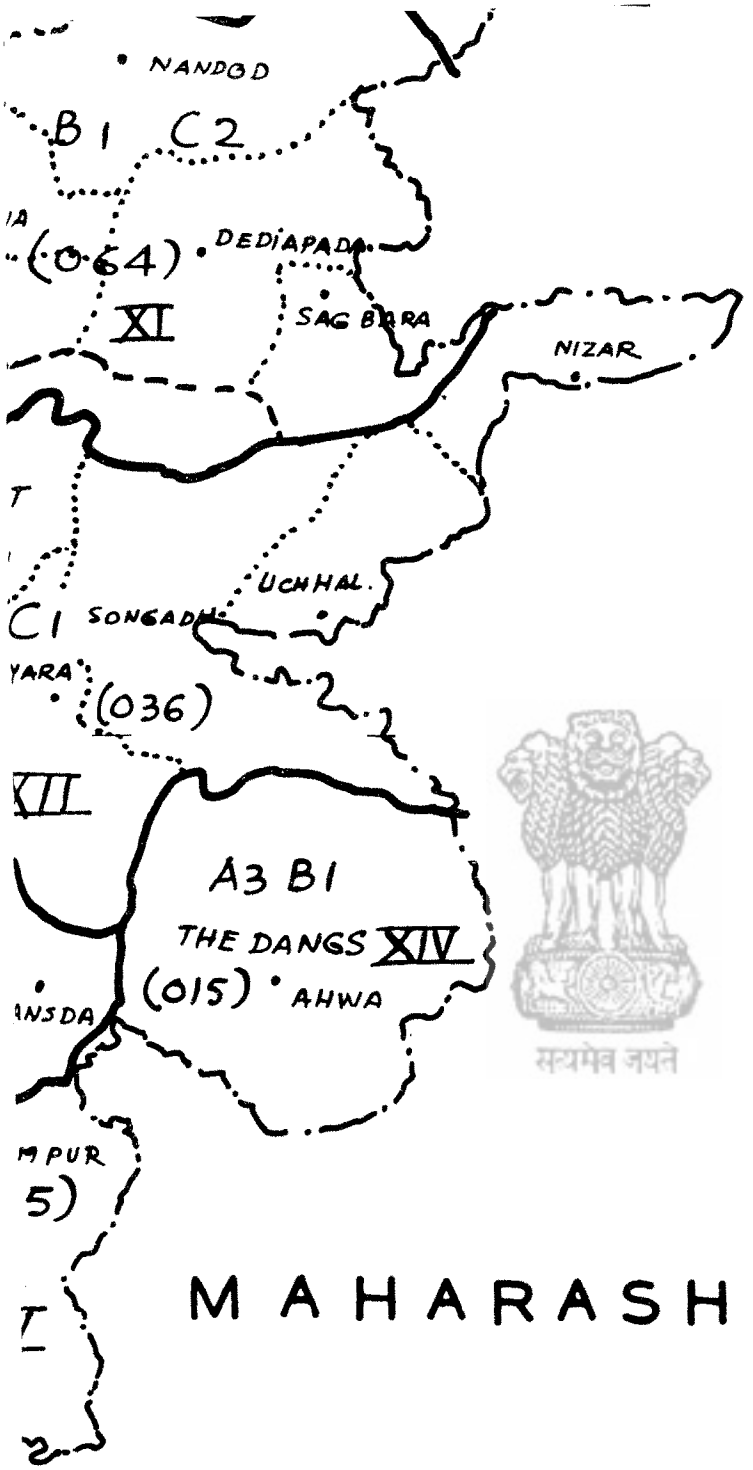
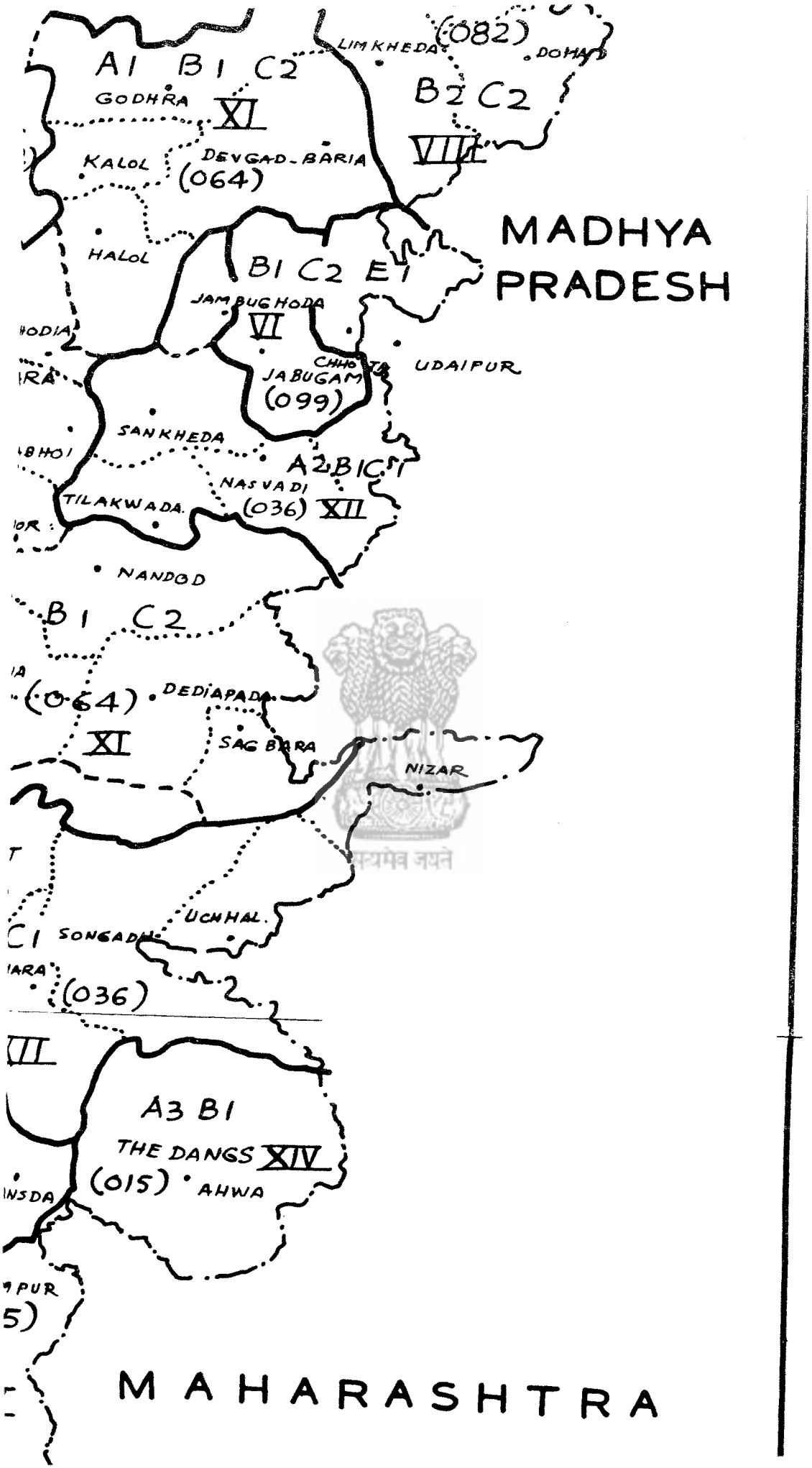
GUJARAT

RAINFALL PATTERN

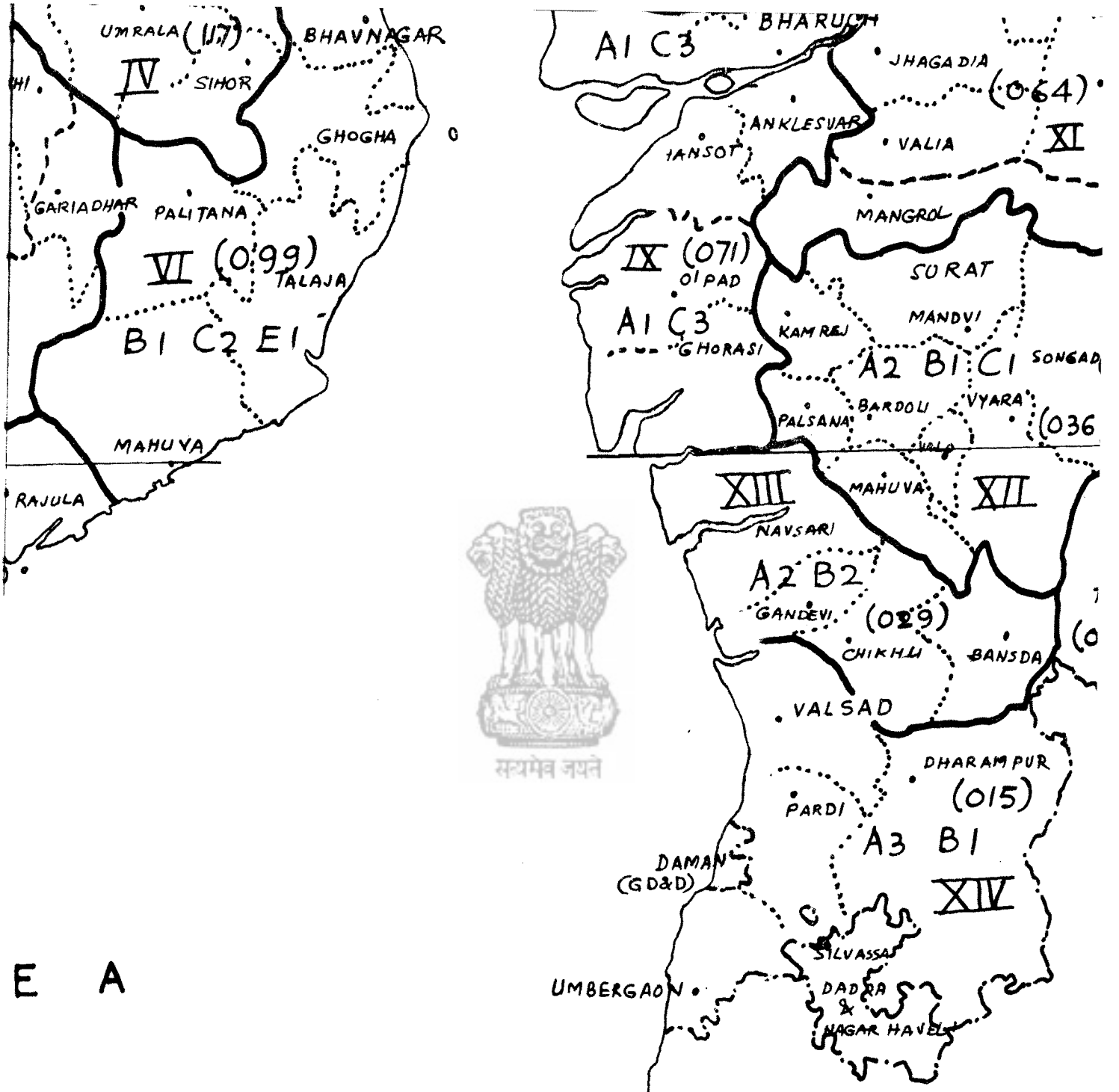





A1 B1 C2
XI
GODHRA
KALOL
DEVGAD-BARIA
(064)
HALOL
LIMKHEDA
(082)
DOHAD
B2 C2
VIII
MADHYA
PRADESH
B1 C2 E1
JAMBUGHODA
VI
CHHOTA UDAIPUR
JABUGAM
(099)
SANKHEDA
A2 B1 C1
NASVADI
(036) XII
TILAKWADA
NANDOD
B1 C2
(064)
XI
DEDIAPADA
SAGBARA
NIZAR
UCHHAL
SONGADH
(036)
A3 B1
THE DANGS XIV
(015)
AHWA
MAHARASHTRA

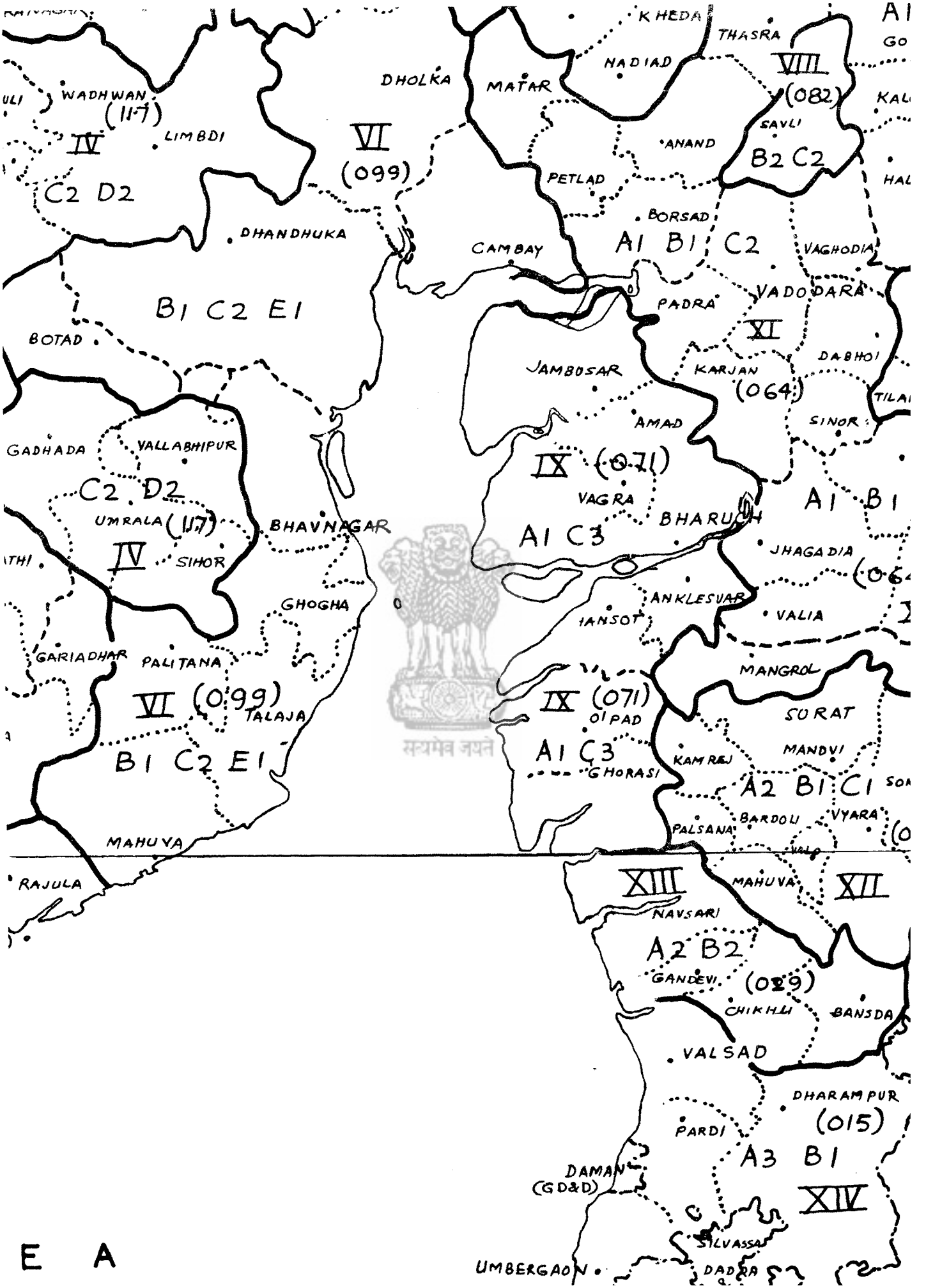
APPENDIX V

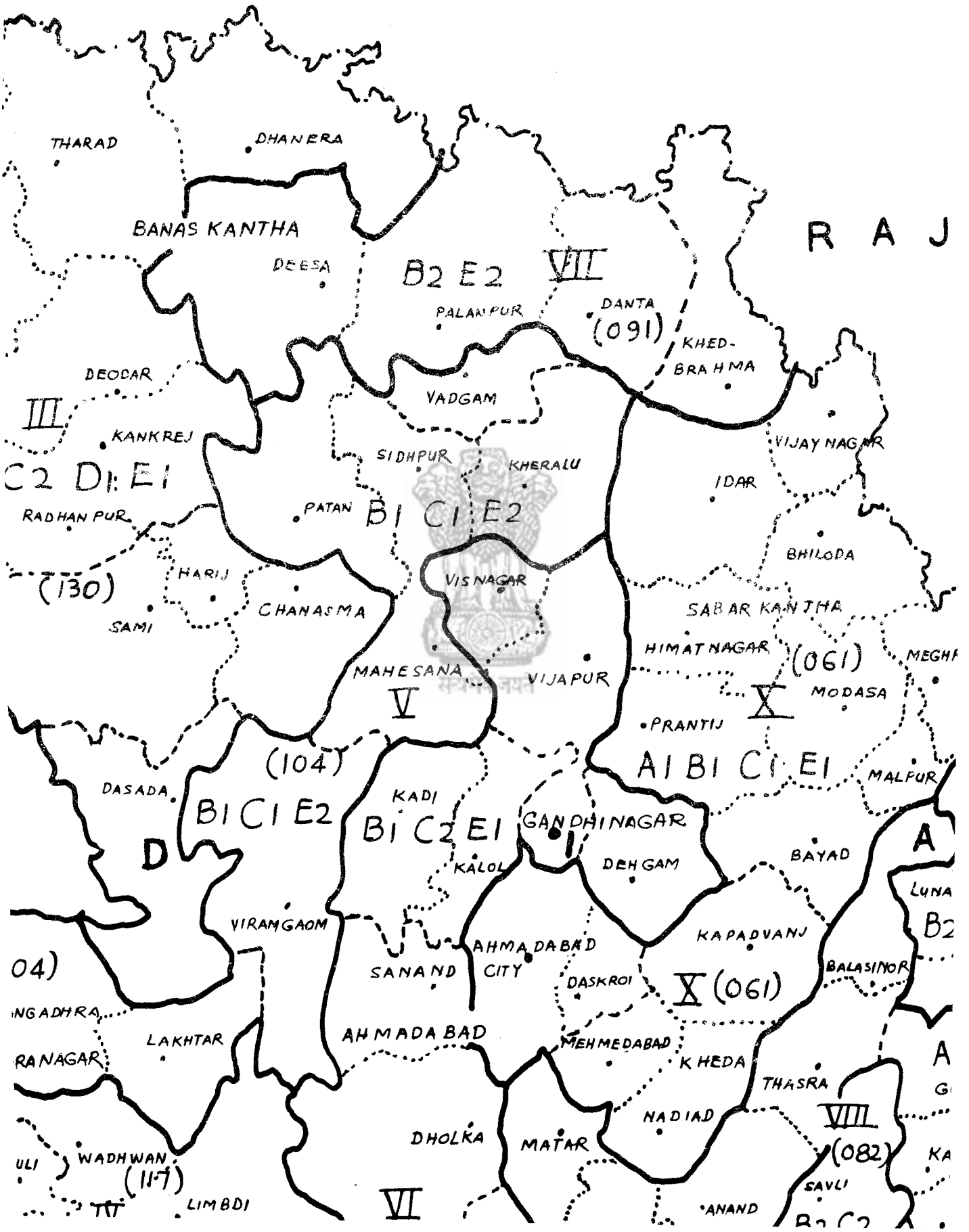

AJASTHAN
MEGHRAJ
MALPUR
VIII
(082)
A
SANTRAMPUR
LUNAVADA
B2 C2
JHALOD
SHEHERA
PANCH MAHALS
(082)
LIMKHEDA
DOHAD
A1 B1 C2
B2 C2
GODHRA
XI
VIII
KALOL
DEVGAD-BARIA
(064)
MADHYA

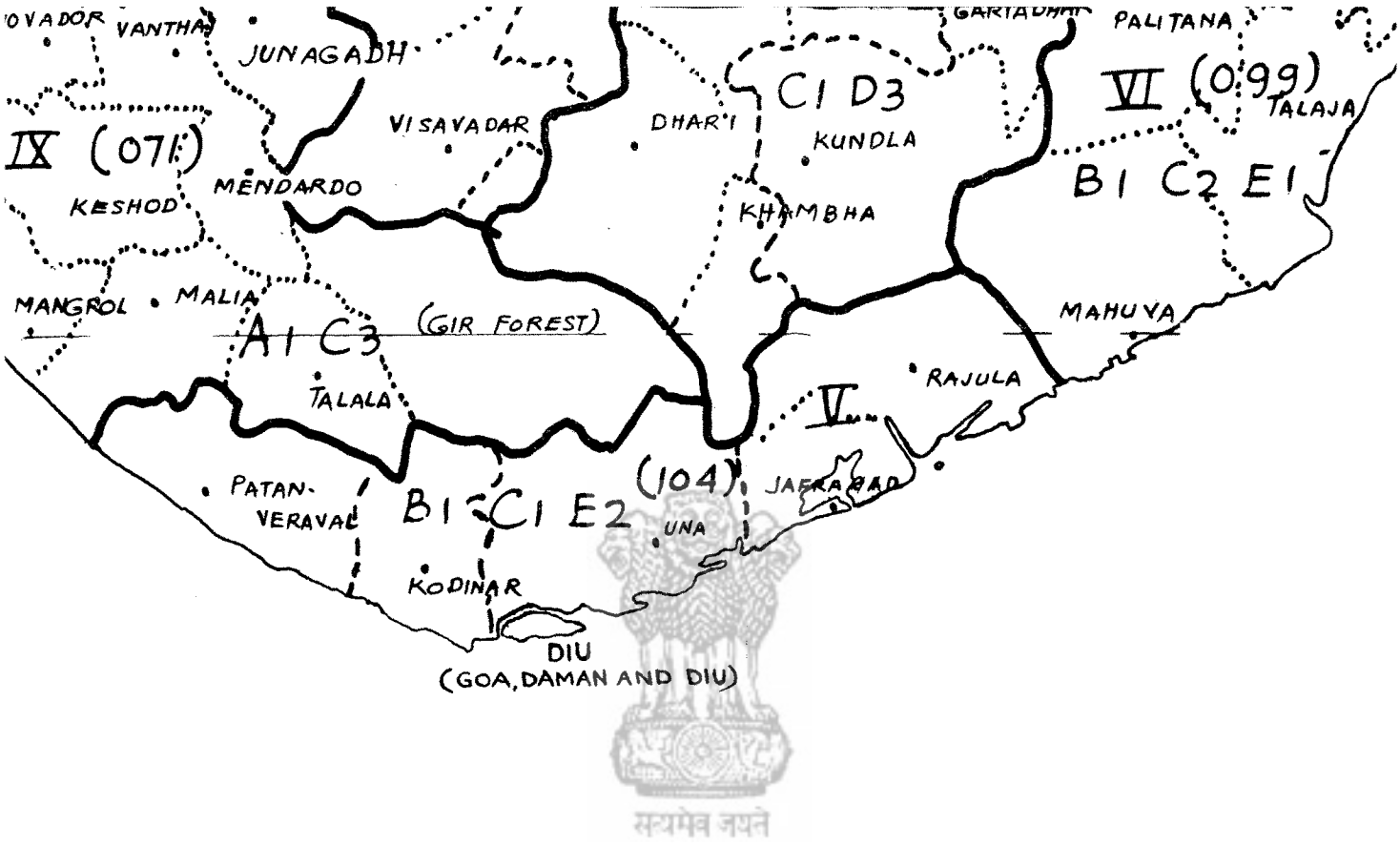


E A

twelve nautical miles measured from the appropriate base line.

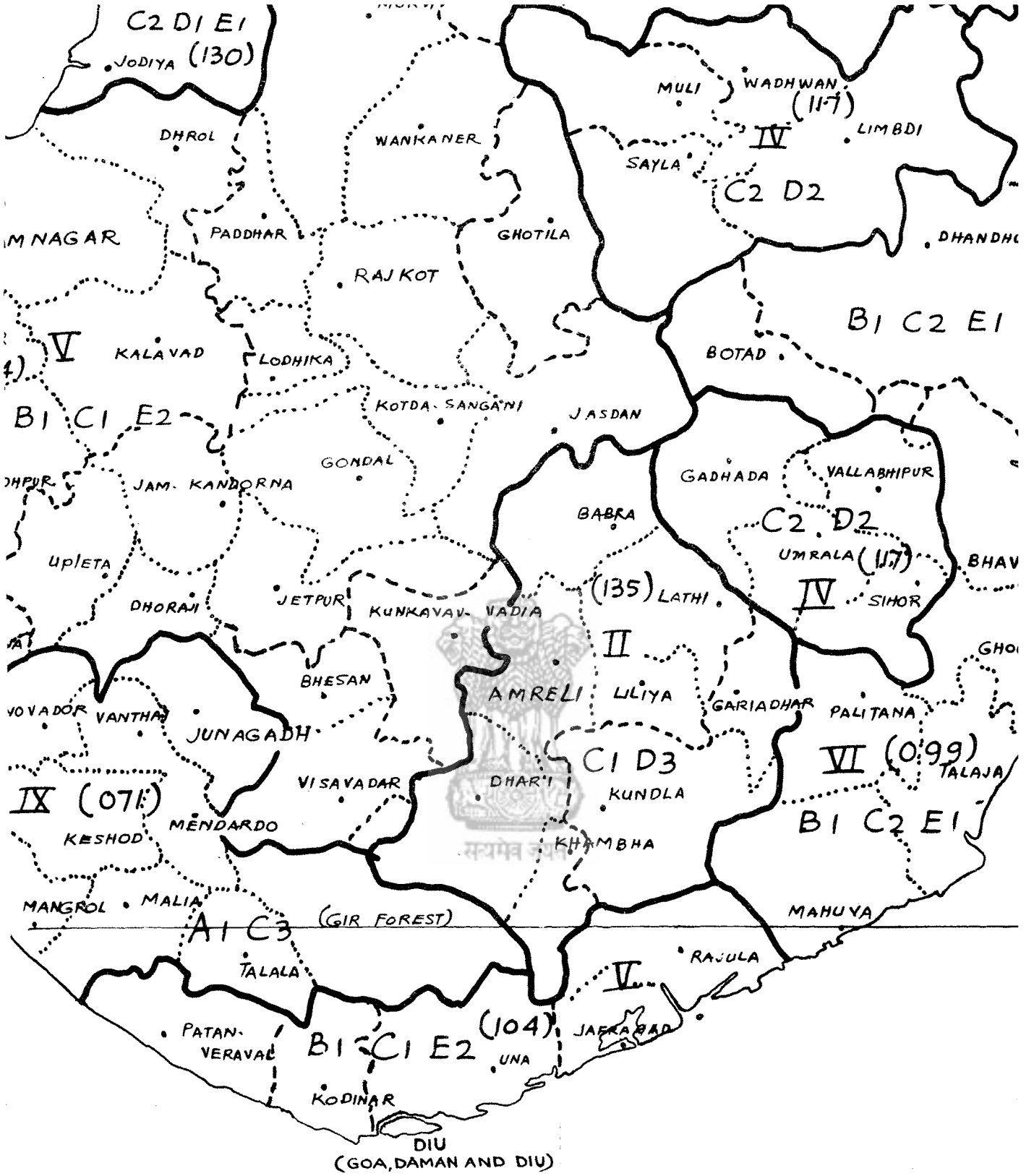

KHEDA
THASRA
NADIAD
DHOLKA
MATAR
VIII
(082)
SAVLI
ANAND
B2 C2
WADHWAN
(117)
LIMBDI
IV
C2 D2
VI
(099)
PETLAD
BORSAD
A1 B1 C2
DHANDHUKA
CAMBAY
VAGHODIA
B1 C2 E1
PADRA
VADODARA
XI
BOTAD
JAMBUSAR
KARJAN
(064)
DABHOI
AMOD
SINOR
GADHADA
VALLABHIPUR
IX (071)
C2 D2
VAGRA
BHARUCH
A1 B1
UMRALA (117)
BHAVNAGAR
A1 C3
IV
SIHOR
JHAGADIA
ANKLESVAR
GHOGHA
JANSOT
VALIA
GARIADHAR
PALITANA
MANGROL
VI (099)
TALAJA
IX (071)
OLPAD
SURAT
B1 C2 E1
A1 C3
KAMREJ
MANDVI
GHORASI
A2 B1 C1
BARDOLI
VYARA
PALSANA
MAHUVA
RAJULA
XIII
MAHUVA
XII
NAVSARI
A2 B2
GANDEVI
(029)
CHIKHLI
BANSDA
VALSAD
DHARAMPUR
(015)
PARDI
A3 B1
DAMAN
(GD&D)
XIV
SILVASSA
UMBERGAON
DADRA

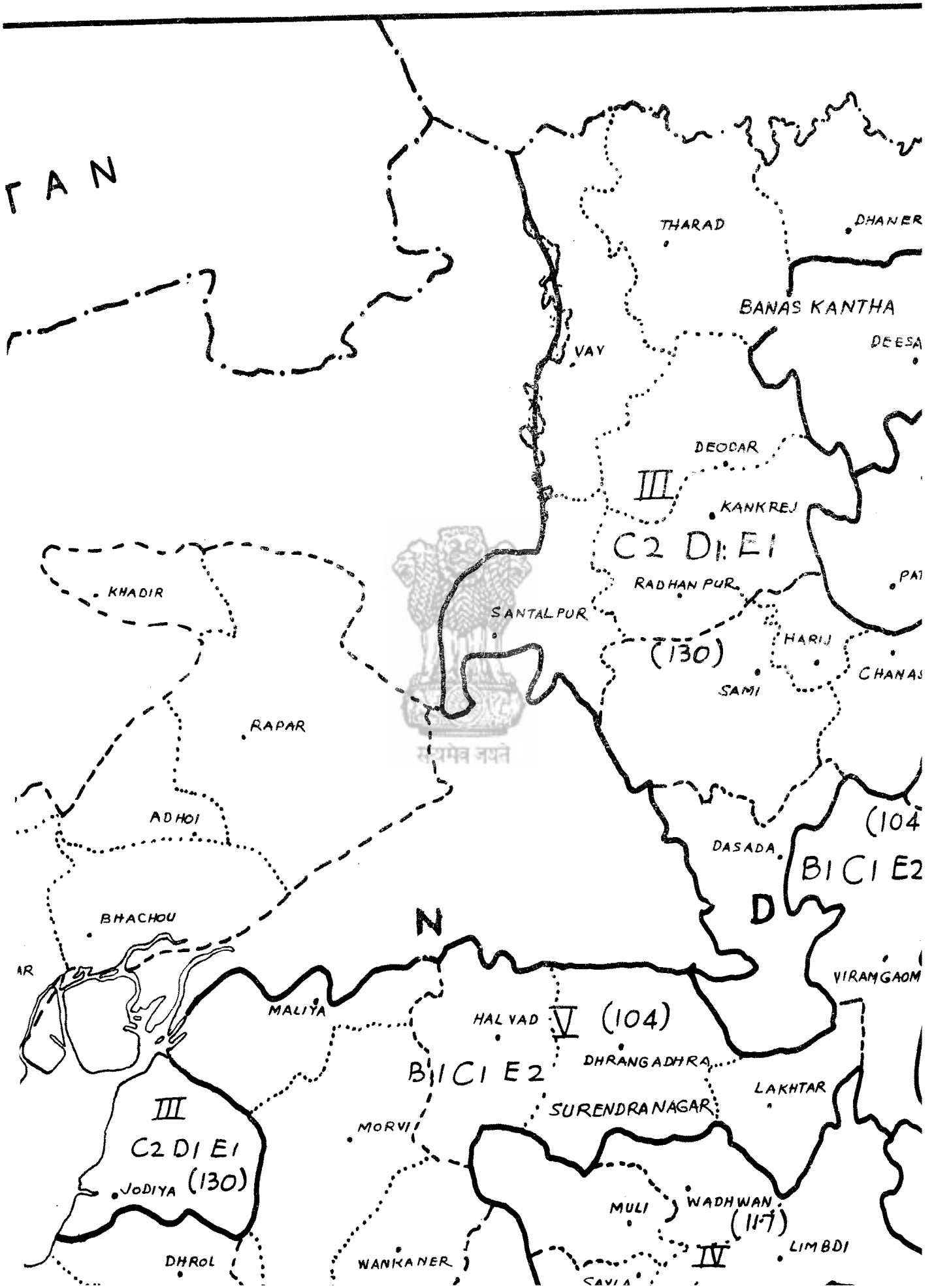

THARAD
DHANERA
BANAS KANTHA
DEESA
B2 E2
VII
PALANPUR
DANTA
(091)
KHED-
BRAHMA
R A J
DEODAR
III
KANKREJ
VADGAM
SIDHPUR
KHERALU
VIJAY NAGAR
C2 D1 E1
PATAN
B1 C1 E2
IDAR
RADHAN PUR
BHILODA
(130)
HARIJ
VISNAGAR
SAMI
CHANASMA
SABAR KANTHA
HIMAT NAGAR
(061)
MEGHR
MAHESANA
V
VIJAPUR
X
MODASA
PRANTIJ
(104)
A1 B1 C1 E1
MALPUR
DASADA
KADI
B1 C1 E2
B1 C2 E1
GANDHINAGAR
D
I
KALOL
DEHGAM
BAYAD
A
LUNA
B2
VIRAMGAOM
KAPADVANJ
AHMADABAD
CITY
SANAND
DASKROI
X (061)
BALASINOR
04)
NGADHRA
LAKHTAR
AHMADABAD
MEHMEDABAD
KHEDA
RANAGAR
THASRA
A
G
NADIAD
VIII
DHOLKA
MATAR
(082)
ULI
WADHWAN
(117)
SAVLI
KA
LIMBDI
VI
ANAND
B2 C2

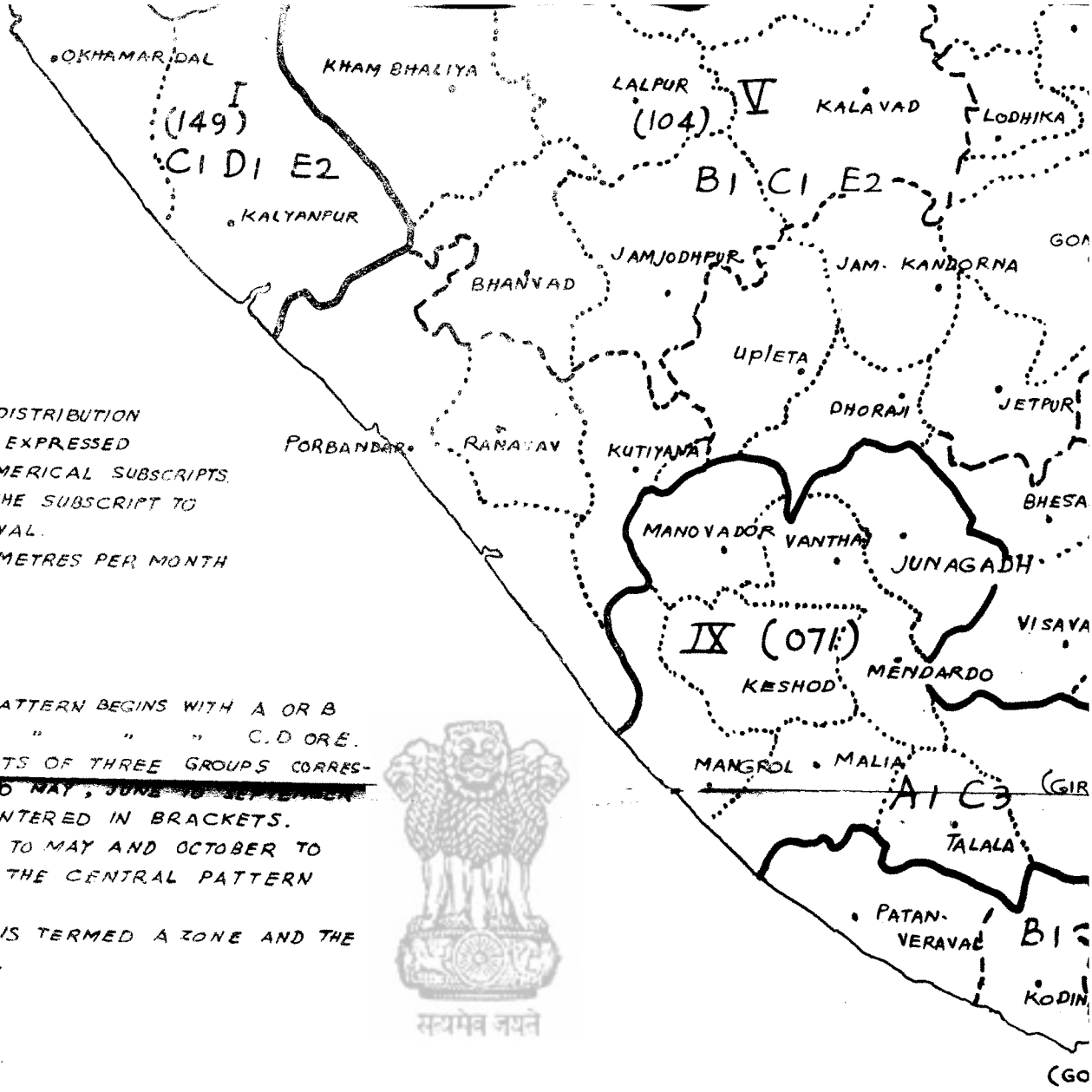


R A B I A N S E A

The territorial waters of India extend into the sea to a distance of twelve nautical miles measured fr


C2 D1 E1
JODIYA (130)
DHROL
WANKANER
MULI
WADHWAN
(117)
IV
LIMBDI
SAYLA
C2 D2
M NAGAR
PADDHAR
GHOTILA
RAJKOT
DHANDHU
B1 C2 E1
BOTAD
V
KALAVAD
LODHIKA
B1 C1 E2
KOTDA-SANGANI
JASDAN
GONDAL
GADHADA
VALLABHIPUR
JAM-KANDORNA
BABRA
C2 D2
UMRALA (117)
BHAV
UPLETA
(135)
LATHI
IV
SIHOR
DHORAJI
JETPUR
KUNKAVAV-VADIA
II
BHESAN
AMRELI
LILIYA
GARIADHAR
PALITANA
VANTHA
JUNAGADH
C1 D3
VI (099)
TALAJA
IX (071)
VISAVADAR
DHARI
KUNDLA
B1 C2 E1
KESHOD
MENDARDO
KHAMBHA
MANGROL
MALIA
A1 C3
(GIR FOREST)
MAHUVA
RAJULA
TALALA
V
PATAN-VERAVAL
B1 C1 E2
(104)
UNA
JAFRABAD
KODINAR
DIU
(GOA, DAMAN AND DIU)
RABIAN SEA


THARAD
DHANER
BANAS KANTHA
VAV
DEESA
DEODAR
III
KANKREJ
C2 D1 E1
RADHAN PUR
SANTALPUR
(130)
HARIJ
SAMI
KHADIR
RAPAR
ADHOI
DASADA
(104
B1 C1 E2
D
N
BHACHOU
VIRAMGAOM
MALIYA
HALVAD
V
(104)
B1 C1 E2
DHRANGADHRA
LAKHTAR
SURENDRANAGAR
III
C2 D1 E1
MORVI
JODIYA (130)
MULI
WADHWAN
(117)
LIMBDI
DHROL
WANKANER
IV



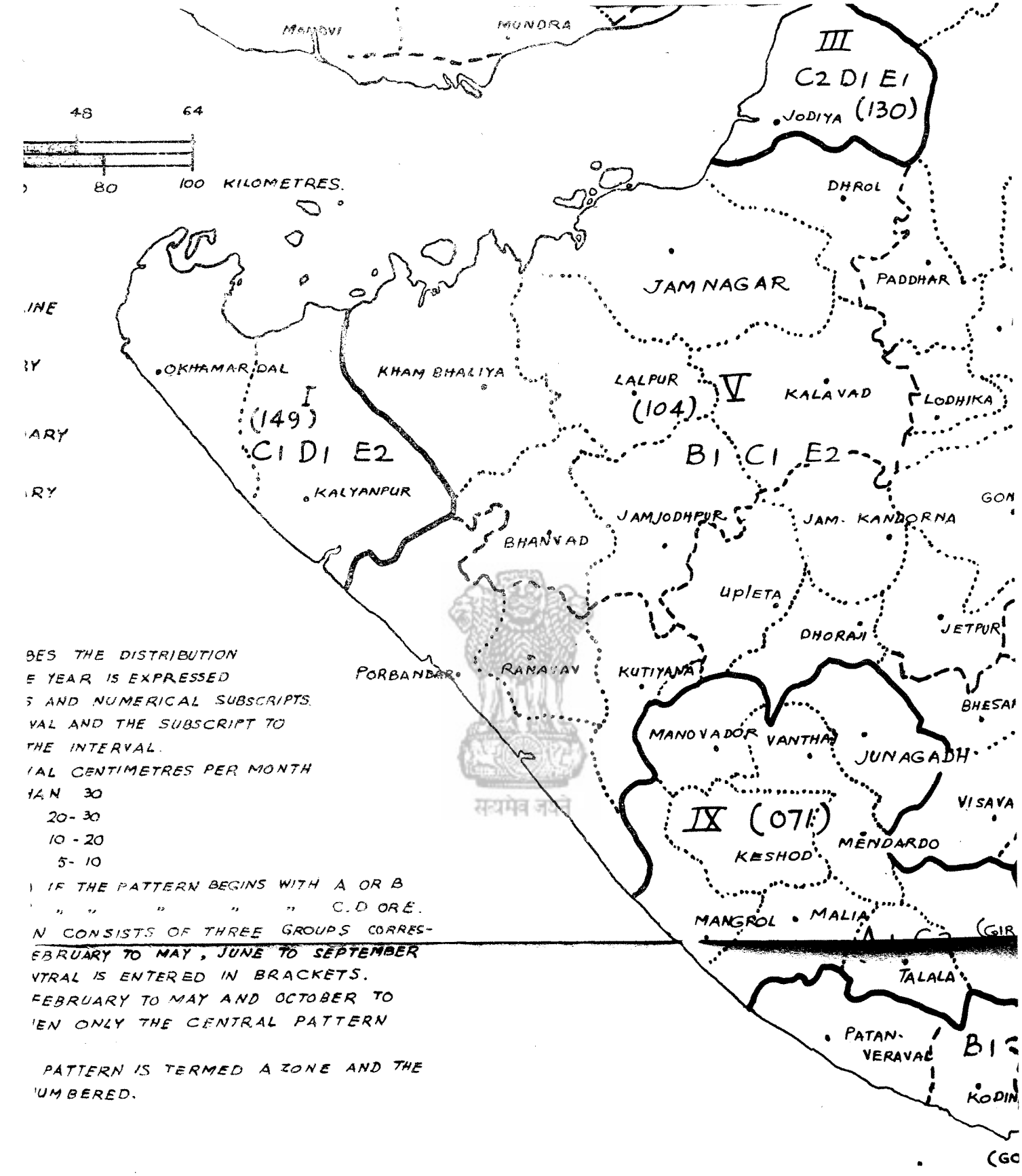
BES THE DISTRIBUTION
E YEAR IS EXPRESSED
S AND NUMERICAL SUBSCRIPTS.
VAL AND THE SUBSCRIPT TO
THE INTERVAL.
AL CENTIMETRES PER MONTH
AN 30
20- 30
10 - 20
5- 10
IF THE PATTERN BEGINS WITH A OR B
" " " " " C, D OR E.
N CONSISTS OF THREE GROUPS CORRES-
EBRUARY TO MAY, JUNE TO SEPTEMBER
NTRAL IS ENTERED IN BRACKETS.
FEBRUARY TO MAY AND OCTOBER TO
EN ONLY THE CENTRAL PATTERN

PATTERN IS TERMED A ZONE AND THE
UMBERED.

RAINFALL ZONES.
UMBERS WITHIN BRACKETS GIVE THEIR
NTS.

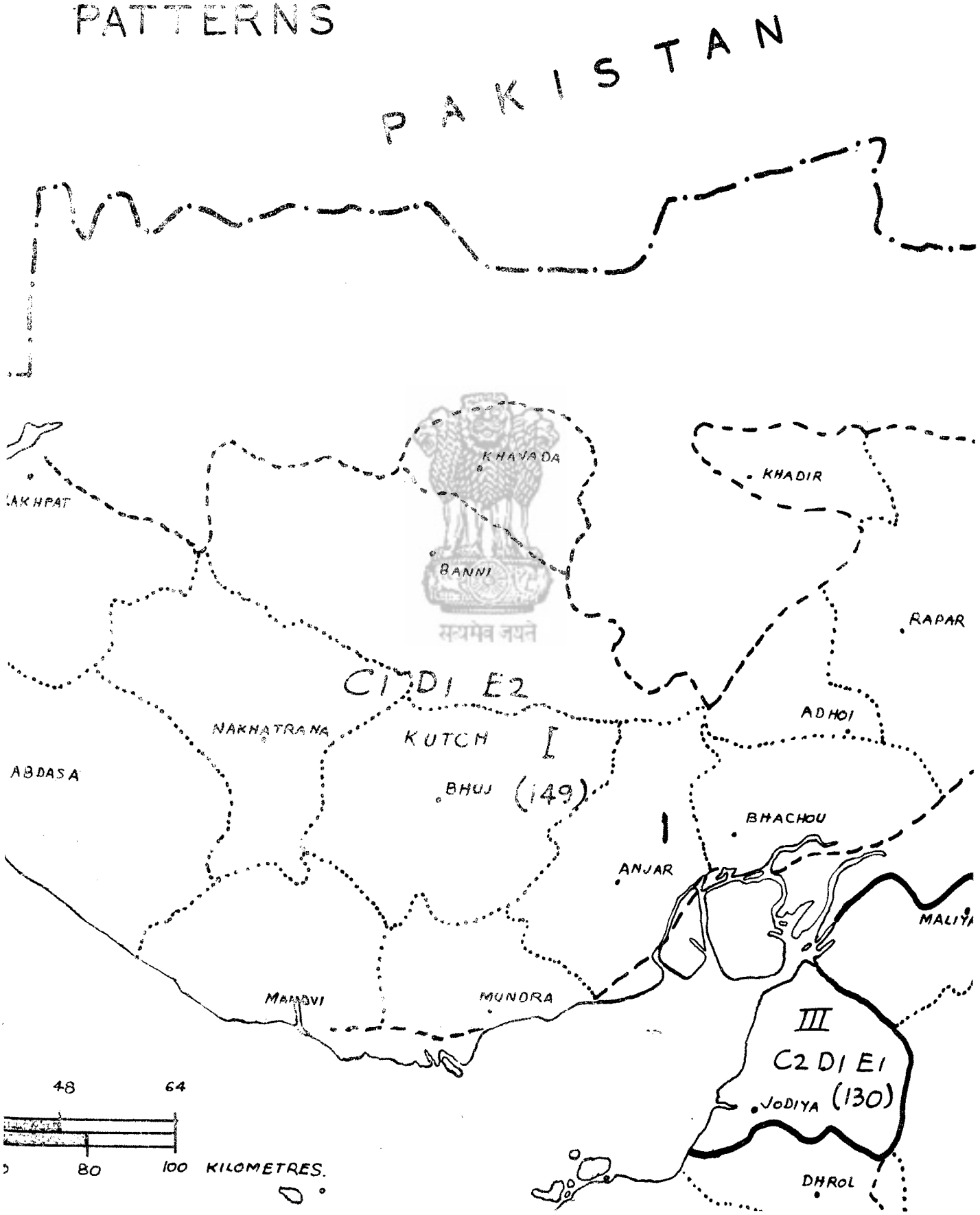
A R A B I A

The territorial waters of India extend


MANDVI
MUNDRA
III
C2 D1 E1
JODIYA (130)
48
64
80
100 KILOMETRES.
DHROL
JAM NAGAR
PADDHAR
OKHAMARDAL
KHAM BHALIYA
LALPUR
(104)
V
KALAVAD
LODHIKA
I
(149)
C1 D1 E2
B1 C1 E2
KALYANPUR
JAMJODHPUR
JAM. KANDORNA
BHANVAD
UPLETA
DHORAJI
JETPUR
PORBANDAR
RANAVAV
KUTIYANA
MANOVADOR
VANTHALI
JUNAGADH
IX (071)
KESHOD
MENDARDO
MANGROL
MALIA
TALALA
PATAN-
VERAVAL
KODIN
BES THE DISTRIBUTION
E YEAR IS EXPRESSED
S AND NUMERICAL SUBSCRIPTS.
VAL AND THE SUBSCRIPT TO
THE INTERVAL.
IAL CENTIMETRES PER MONTH
IAN 30
20- 30
10 - 20
5- 10
IF THE PATTERN BEGINS WITH A OR B
" " " " " C, D OR E.
N CONSISTS OF THREE GROUPS CORRES-
EBRUARY TO MAY, JUNE TO SEPTEMBER
NTRAL IS ENTERED IN BRACKETS.
FEBRUARY TO MAY AND OCTOBER TO
EN ONLY THE CENTRAL PATTERN
PATTERN IS TERMED A ZONE AND THE
UMBERED.
RAINFALL ZONES.
UMBERS WITHIN BRACKETS GIVE THEIR
NTS.
A R A B I

JARAT

PATTERNS



STATE BOUNDARY

DISTRICT BOUNDARY

TALUK BOUNDARY

ZONE

LEGEND

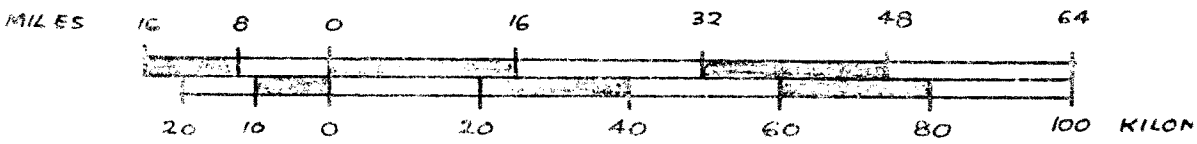
THE RAINFALL PATTERN WHICH DESCRIBES THE DISTRIBU
OF MONTHLY RAINFALL THROUGHOUT THE YEAR IS EXPRES
IN CODED FORM WITH LETTER SYMBOLS AND NUMERICAL
A LETTER DENOTES A RAINFALL INTERVAL AND THE SUBS
EACH LETTER THE NO. OF MONTHS IN THE INTERVAL.

SYMBOL	RAINFALL INTERVAL CENTIMETRES.
A	GREATER THAN 30
B	20 - 30
C	10 - 20
D	5 - 10
E	LESS THAN 10 IF THE PATTERN E
	" " 5 " " "

THE CODED FORM OF EACH PATTERN CONSISTS OF T
PONDING TO THE THREE SEASONS FEBRUARY TO MAY, .
AND OCTOBER TO JANUARY. THE CENTRAL IS ENTERED
IF HOWEVER, EACH OF THE MONTHS FEBRUARY TO MAY.
JANUARY IS LESS THAN 5 CMPM; THEN ONLY THE CEN
WITH OUT BRACKETS IS STATED.
THE AREA COVERED BY A RAINFALL PATTERN IS TERME
ZONES IN THE MAP ARE SERIALLY NUMBERED.

ROMAN NUMBERS INDICATE STATE RAINFALL ZONES.
THREE-DIGIT FIGURES IN ARABIC NUMBERS WITHIN BR
CORRESPONDING ALL-INDIA EQUIVALENTS.

Based upon Survey of India map with the permission of t



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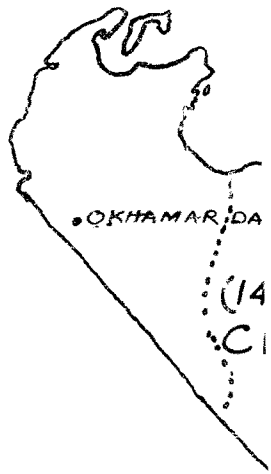


INTERNATIONAL LINE

STATE BOUNDARY

DISTRICT BOUNDARY

TALUK BOUNDARY

ZONE

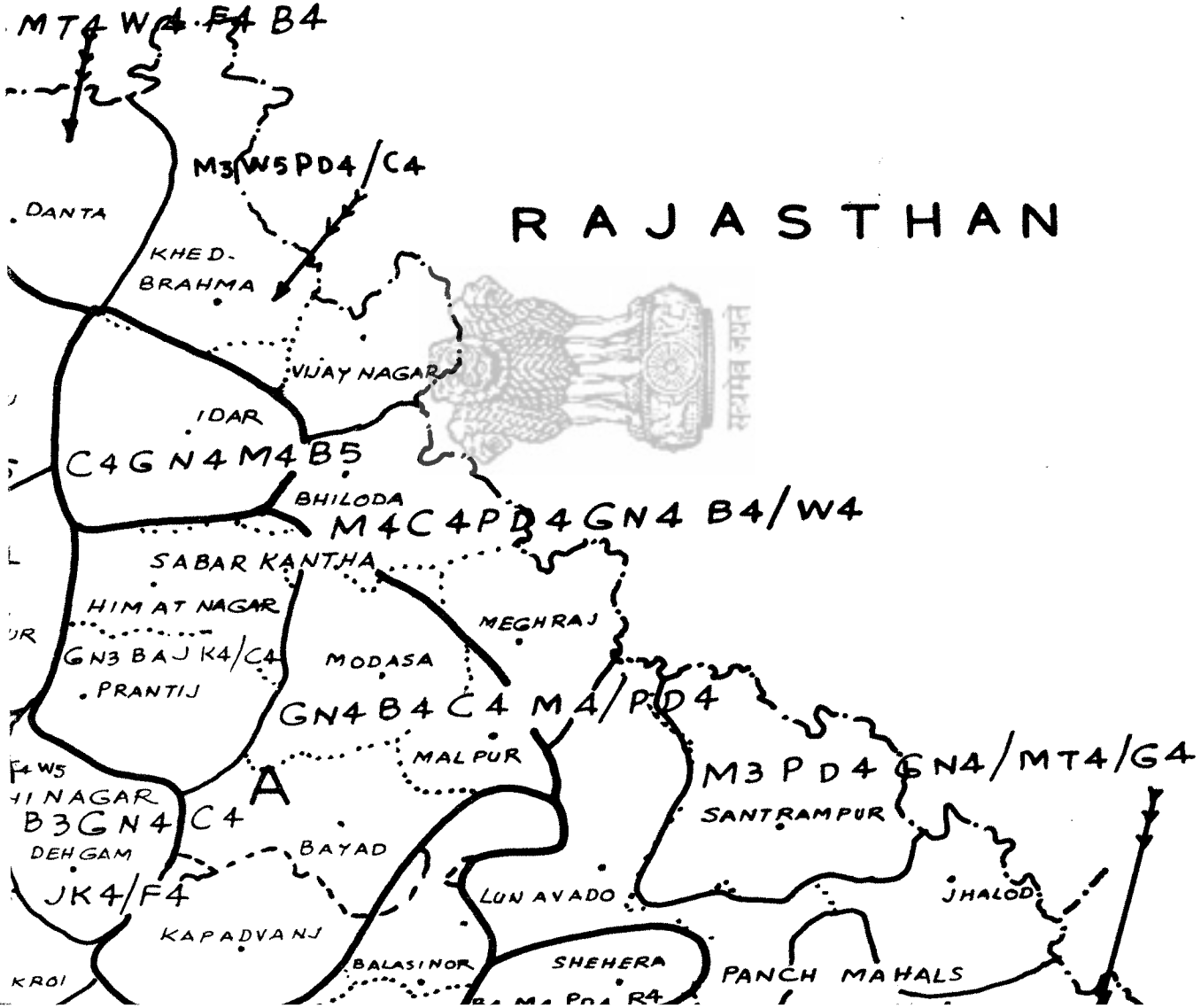
LEGEND

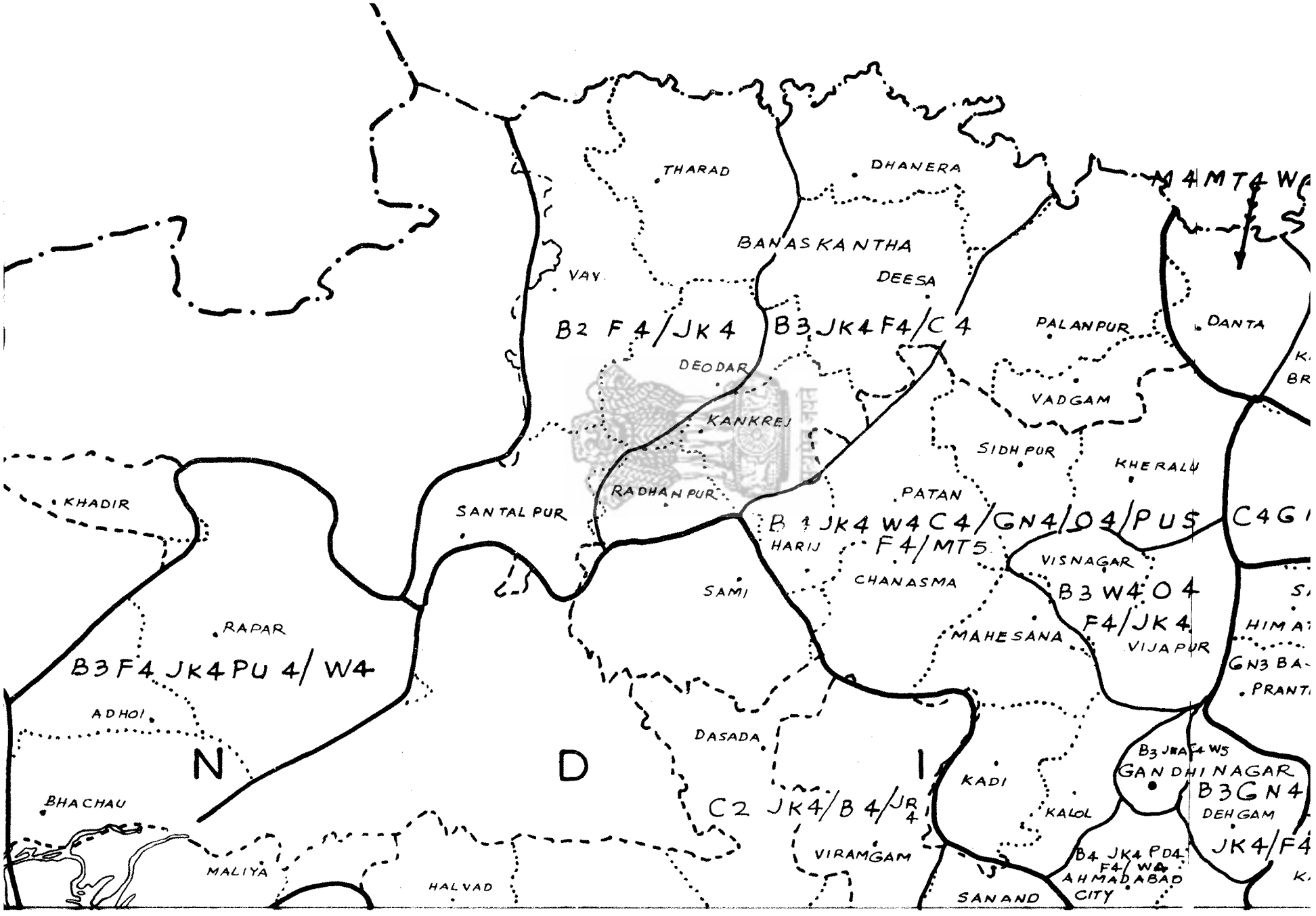
THE RAINFALL PATTERN WHICH DESCRIBES THE DISTRIBUTION OF MONTHLY RAINFALL THROUGHOUT THE YEAR IS EXPRESSED IN CODED FORM WITH LETTER SYMBOLS AND NUMERICAL SUBSCRIP A LETTER DENOTES A RAINFALL INTERVAL AND THE SUBSCRIPT TO EACH LETTER THE NO. OF MONTHS IN THE INTERVAL.

SYMBOL	RAINFALL INTERVAL CENTIMETRES PER MON
A	GREATER THAN 30
B	20 - 30
C	10 - 20
D	5 - 10
E	LESS THAN 10 IF THE PATTERN BEGINS WI
	" " 5 " " " " "

THE CODED FORM OF EACH PATTERN CONSISTS OF THREE GR PONDING TO THE THREE SEASONS FEBRUARY TO MAY, JUNE TO AND OCTOBER TO JANUARY. THE CENTRAL IS ENTERED IN BRAC IF HOWEVER, EACH OF THE MONTHS FEBRUARY TO MAY AND OCT JANUARY IS LESS THAN 5 CMPM; THEN ONLY THE CENTRAL P WITH OUT BRACKETS IS STATED.
THE AREA COVERED BY A RAINFALL PATTERN IS TERMED A ZO ZONES IN THE MAP ARE SERIALLY NUMBERED.

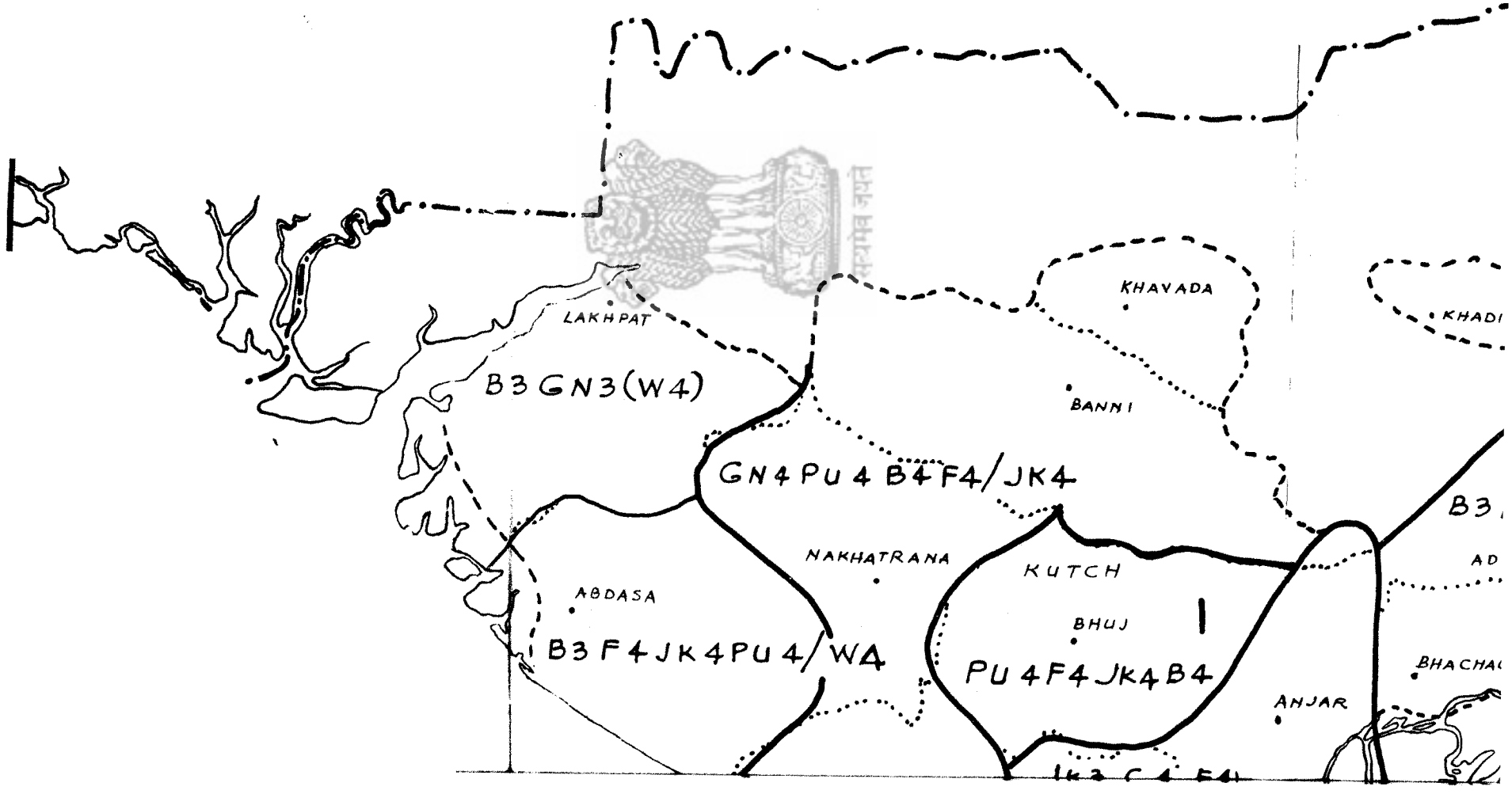
ROMAN NUMBERS INDICATE STATE RAINFALL ZONES.
THREE-DIGIT FIGURES IN ARABIC NUMBERS WITHIN BRACKET CORRESPONDING ALL-INDIA EQUIVALENTS.

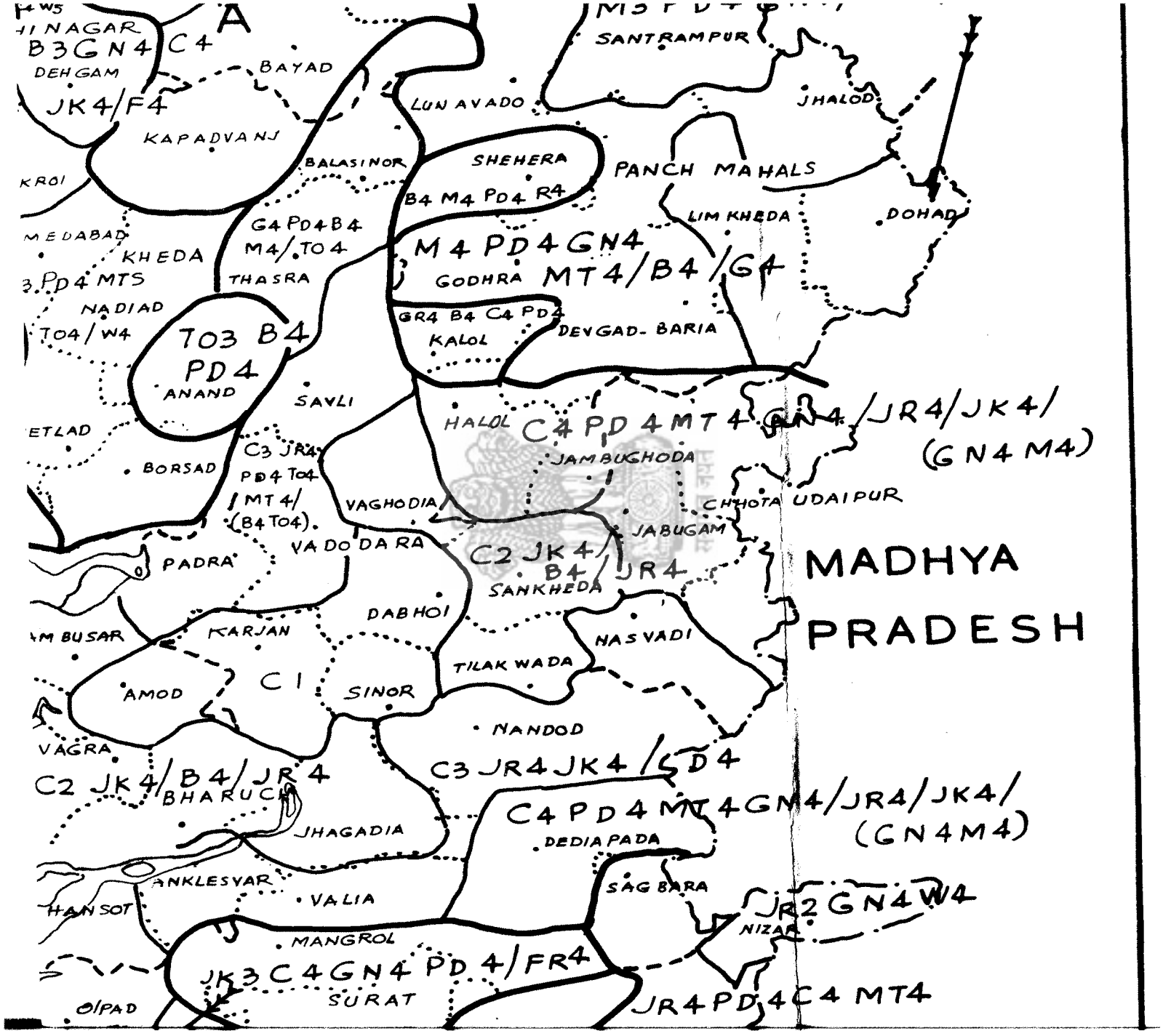

MT4 W4 F4 B4
M3 W5 PD4/C4
RAJASTHAN
DANTA
KHED-
BRAHMA
VIJAY NAGAR
IDAR
C4 G N4 M4 B5
BHILODA
M4 C4 PD4 GN4 B4/W4
SABAR KANTHA
HIMAT NAGAR
GN3 BAJ K4/C4
PRANTIJ
MODASA
MEGHRAJ
GN4 B4 C4 M4/PD4
MALPUR
A
M3 P D4 GN4/MT4/G4
SANTRAMPUR
B3 GN4 C4
DEHGAM
BAYAD
JK4/F4
KAPADVANJ
LUNAVADO
JHALOD
BALASINOR
SHEHERA
PANCH MAHALS
KROI

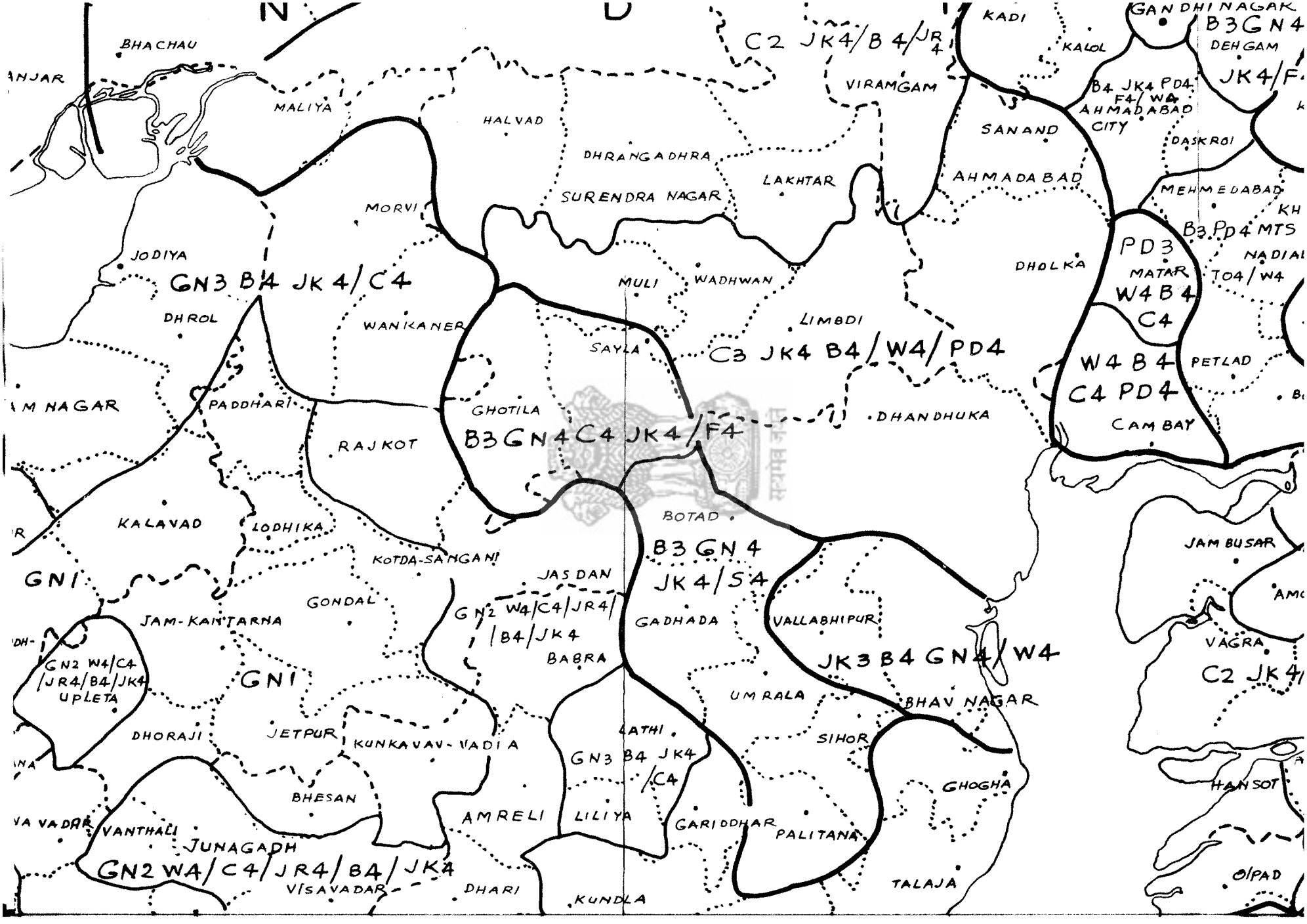

THARAD
DHANERA
BANASKANTHA
VAV
DEESA
B2 F4/JK4
B3JK4F4/C4
PALANPUR
DANTA
DEODAR
VADGAM
KANKREJ
SIDHPUR
KHERALU
KHADIR
RADHANPUR
PATAN
SANTALPUR
B4JK4W4C4/GN4/O4/PU5
HARIJ
F4/MT5
VISNAGAR
SAMI
CHANASMA
B3W4O4
F4/JK4
VIJAPUR
MAHESANA
RAPAR
B3F4JK4PU4/W4
ADHOI
DASADA
N
D
I
B3JK4F4W5
GANDHINAGAR
KADI
B3GN4
DEHGAM
BHACHAU
C2 JK4/B4/JR4
KALOL
JK4/F4
VIRAMGAM
B4JK4PD4
F4/W4
AHMADABAD
CITY
MALIYA
HALVAD
SANAND

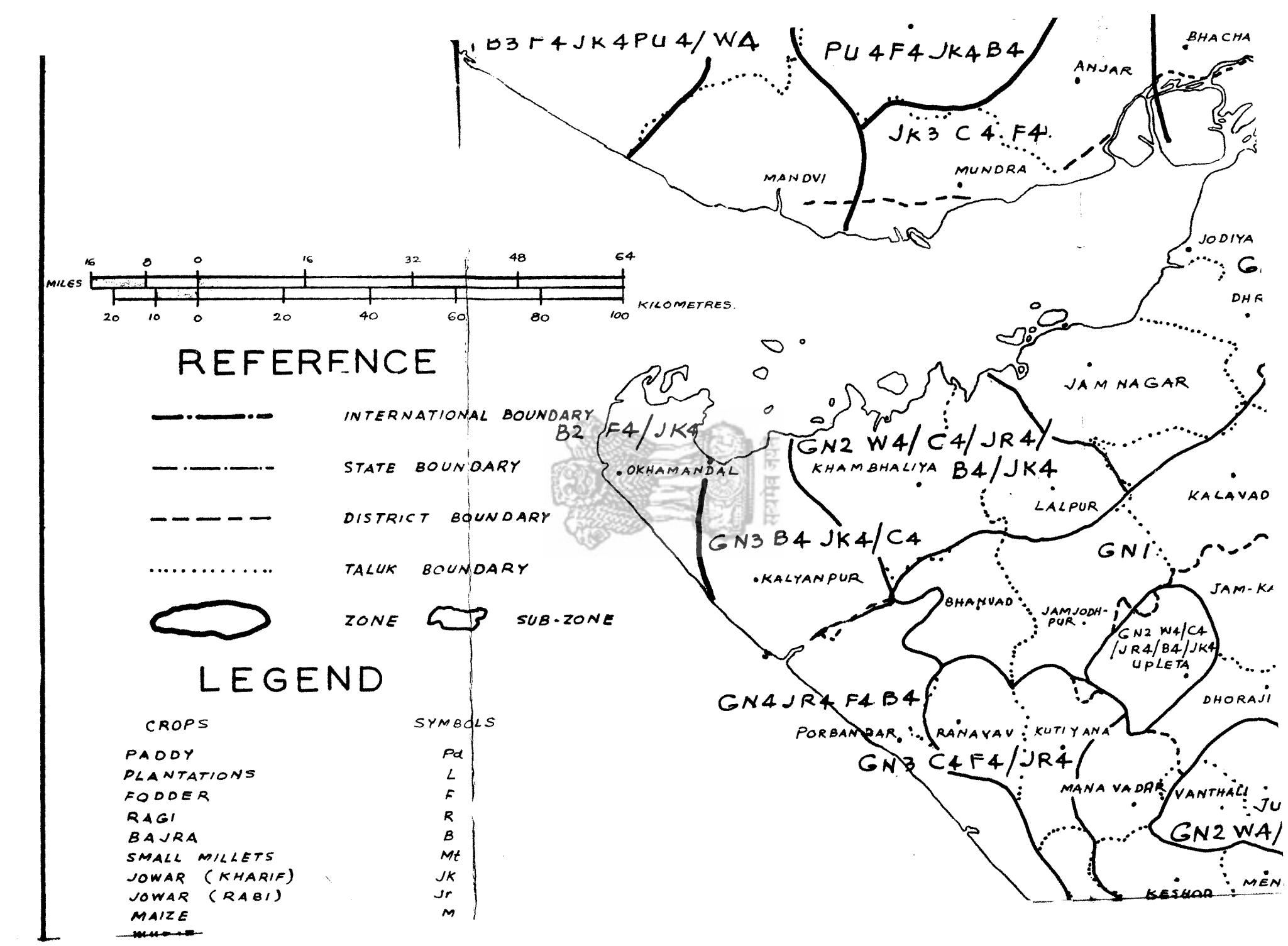
GUJARAT

CROPPING PATTERNS




A
B3G N4 C4
DEHGAM
JK4/F4
BAYAD
KAPADVANJ
KROI
BALASINOR
MEDABAD
KHEDA
3 PD4 MTS
NADIAD
TO4/W4
THASRA
G4 PD4B4
M4/TO4
TO3 B4
PD4
ANAND
SAVLI
ETLAD
BORSAD
C3 JR4
PD4 TO4
/MT4/
(B4 TO4)
PADRA
VADODARA
VAGHODIA
AM BUSAR
KARJAN
DABHOI
AMOD
C1
SINOR
VAGRA
C2 JK4/B4/JR4
BHARUCH
JHAGADIA
ANKLESVAR
VALIA
HANSOT
MANGROL
JK3 C4 GN4 PD4/FR4
SURAT
OLPAD
SANTRAMPUR
LUNAVADO
JHALOD
SHEHERA
B4 M4 PD4 R4
PANCH MAHALS
LIM KHEDA
DOHAD
M4 PD4 GN4
GODHRA MT4/B4/G4
GR4 B4 C4 PD4
KALOL
DEVGAD- BARIA
HALOL
C4 PD4 MT4 GN4/JR4/JK4/
(GN4 M4)
JAMBUGHODA
CHHOTA UDAIPUR
JABUGAM
C2 JK4/
B4/JR4
SANKHEDA
MADHYA
PRADESH
NASVADI
TILAKWADA
NANDOD
C3 JR4 JK4/D4
C4 PD4 MT4 GN4/JR4/JK4/
(GN4 M4)
DEDIAPADA
SAGBARA
JR2 GN4 W4
NIZAR
JR4 PD4 C4 MT4


BHACHAU
MALIYA
HALVAD
DHRANGADHRA
SURENDRA NAGAR
LAKHTAR
VIRAMGAM
KADI
KALOL
GANDHINAGAR
B3GN4
DEHGAM
JK4/F
B4 JK4 PD4 F4/W4
AHMADABAD CITY
SANAND
DASKROI
AHMADABAD
MEHMEDABAD
B3 PD4 MTS
PD3
MATAR
W4B4 C4
T04/W4
PETLAD
CAMBAY
W4 B4 C4 PD4
DHOLKA
MORVI
JODIYA
GN3 B4 JK4/C4
DHROL
WANKANER
MULI
WADHWAN
LIMBDI
C3 JK4 B4/W4/PD4
SAYLA
GHOTILA
B3GN4C4JK4/F4
DHANDHUKA
PADDHARI
RAJKOT
KALAVAD
LODHIKA
KOTDA-SANGANI
BOTAD
B3 GN4 JK4/S4
JASDAN
GN2 W4/C4/JR4/B4/JK4
BABRA
GADHADA
VALLABHIPUR
JK3 B4 GN4/W4
JAM BUSAR
VAGRA
C2 JK4
GONDAL
JAM-KANDORNA
GN1
GN2 W4/C4/JR4/B4/JK4
UPLETA
DHORAJI
JETPUR
KUNKAVAV-VADIA
UMRALA
BHAV NAGAR
SIHOR
LATHI
GN3 B4 JK4/C4
GHOGHA
HANSOT
BHESAN
AMRELI
LILIYA
GARIDDHAR
PALITANA
VANTHALI
JUNAGADH
GN2 WA/C4/JR4/B4/JK4
VISAVADAR
DHARI
KUNDLA
TALAJA
OLPAD

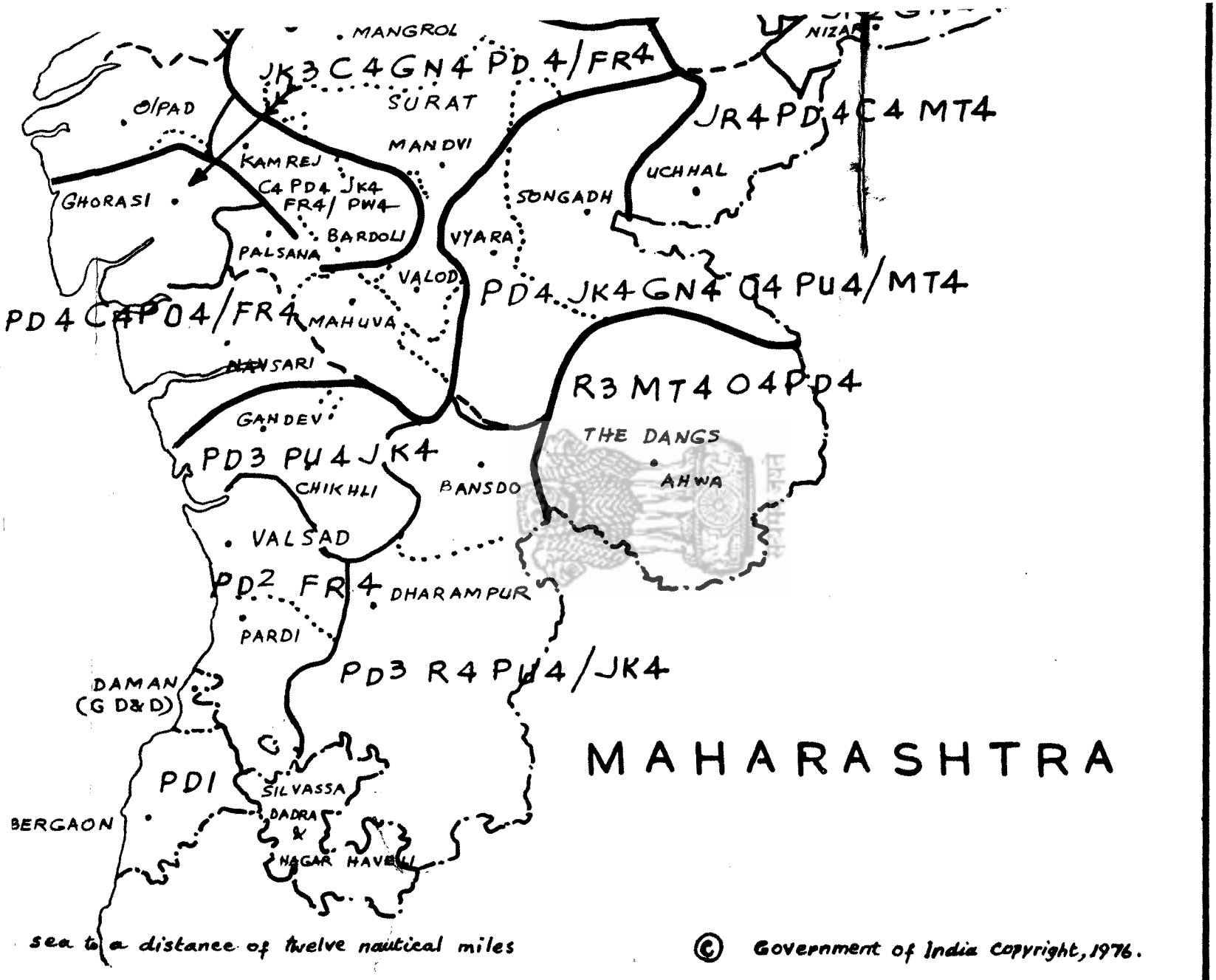


REFERENCE

- INTERNATIONAL BOUNDARY
- STATE BOUNDARY
- DISTRICT BOUNDARY
- TALUK BOUNDARY
- ZONE
- SUB-ZONE

LEGEND

CROPS	SYMBOLS
PADDY	Pd
PLANTATIONS	L
FODDER	F
RAGI	R
BAJRA	B
SMALL MILLETS	Mt
JOWAR (KHARIF)	JK
JOWAR (RABI)	Jr
MAIZE	M


MANGROL
JK3 C4 GN4 PD 4/FR4
SURAT
OLPAD
JR4 PD 4 C4 MT4
MANDVI
KAMREJ
C4 PD4 JK4
FR4/ PW4
GHORASI
UCHHAL
SONGADH
BARDOLI
VYARA
PALSANA
VALOD
PD 4 JK4 GN4 C4 PU4/MT4
PD 4 C4 PO4/FR4
MAHUVA
NANSARI
R3 MT4 O4 PD4
GANDEV
THE DANGS
PD3 PU4 JK4
AHWA
CHIKHLI
BANSDO
VALSAD
PD2 FR4
DHARAMPUR
PARDI
PD3 R4 PU4/JK4
DAMAN
(G D&D)
MAHARASHTRA
PD1
SILVASSA
BERGAON
DADRA
&
NAGAR HAVELI
sea to a distance of twelve nautical miles
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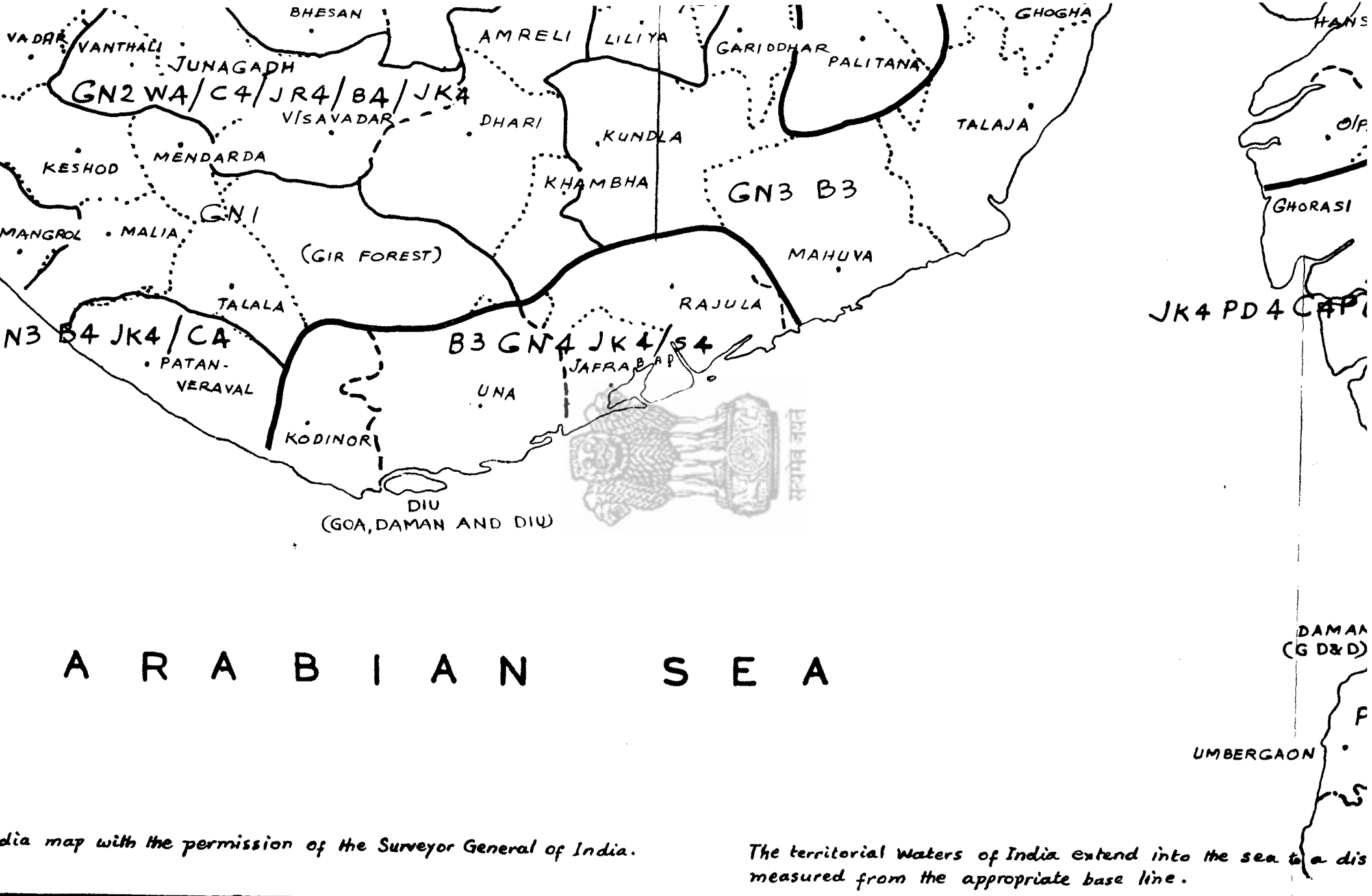
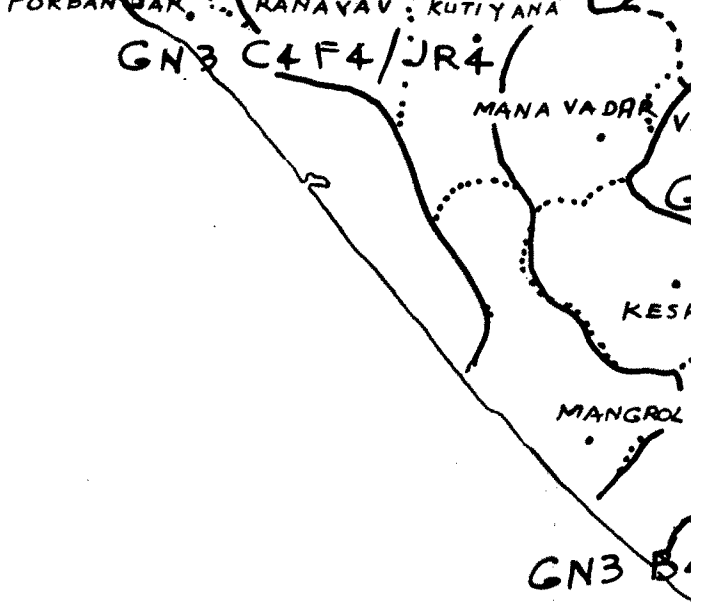


dia map with the permission of the Surveyor General of India.

The territorial waters of India extend into the sea to a dis
measured from the appropriate base line.

PADDY	Pd
PLANTATIONS	L
FODDER	F
RAGI	R
BAJRA	B
SMALL MILLETS	Mt
JOWAR (KHARIF)	JK
JOWAR (RABI)	Jr
MAIZE	M
WHEAT	W
GRAM	G
TUR	T
OTHER PULSES	Pu
COTTON	C
GROUND NUT	Gn
OTHER OILSEEDS	O
SUGAR CANE	S
BARLEY	Ba
OATS	Oa
TOBACCO	To
FRUITS	Fr



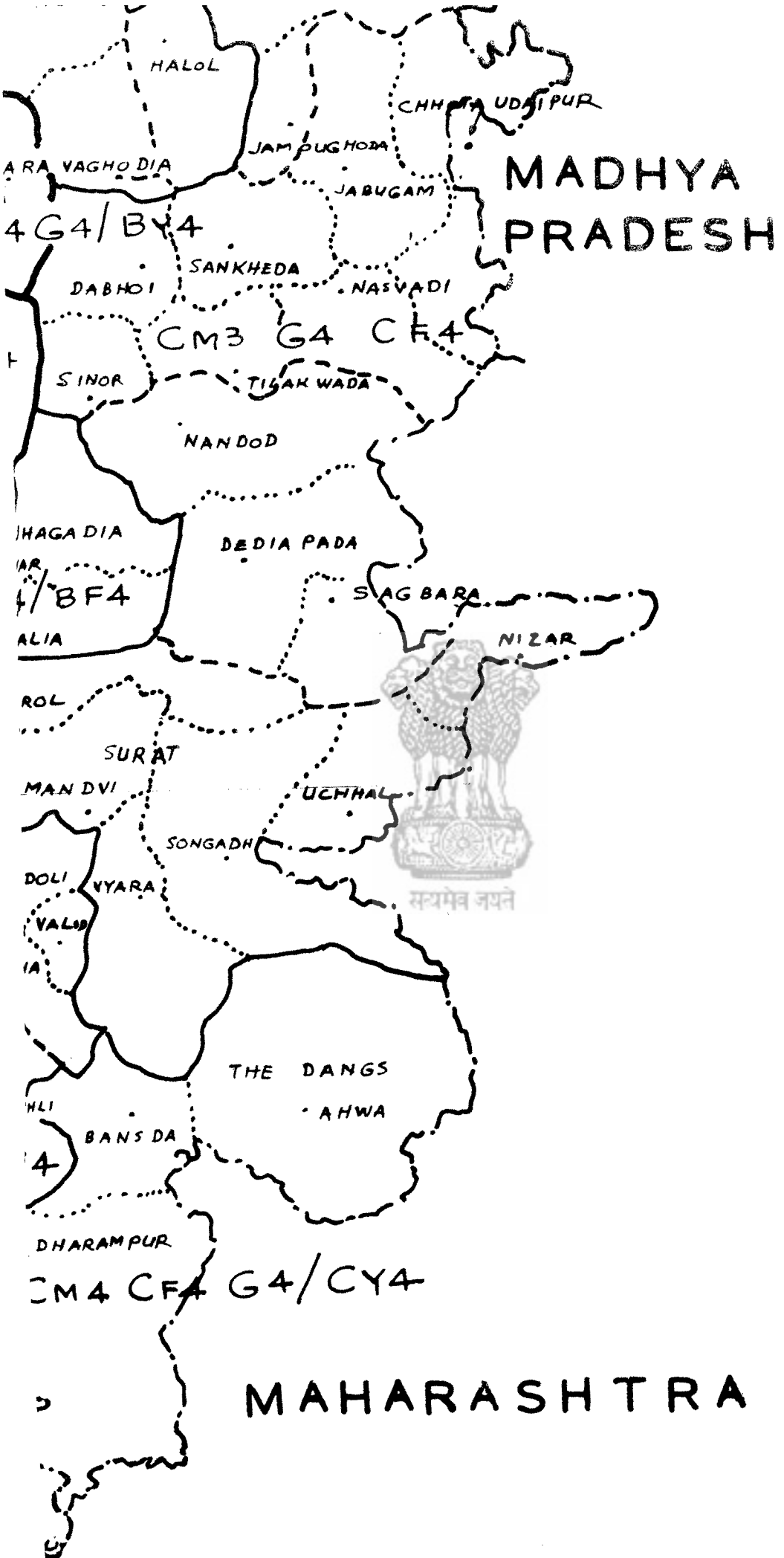
A CROPPING PATTERN CONSISTS OF ONE OR MORE CROPS, EACH WITH A SUBSCRIPT WHICH INDICATES THE PERCENTAGE AREA OF THE CROP CONCERNED

SUBSCRIPT	PERCENT OF GROSS CROPPED AREA
1	GREATER THAN 70
2	50 - 70
3	30 - 50
4	10 - 30
5	LESS THAN 10

EXAMPLE :

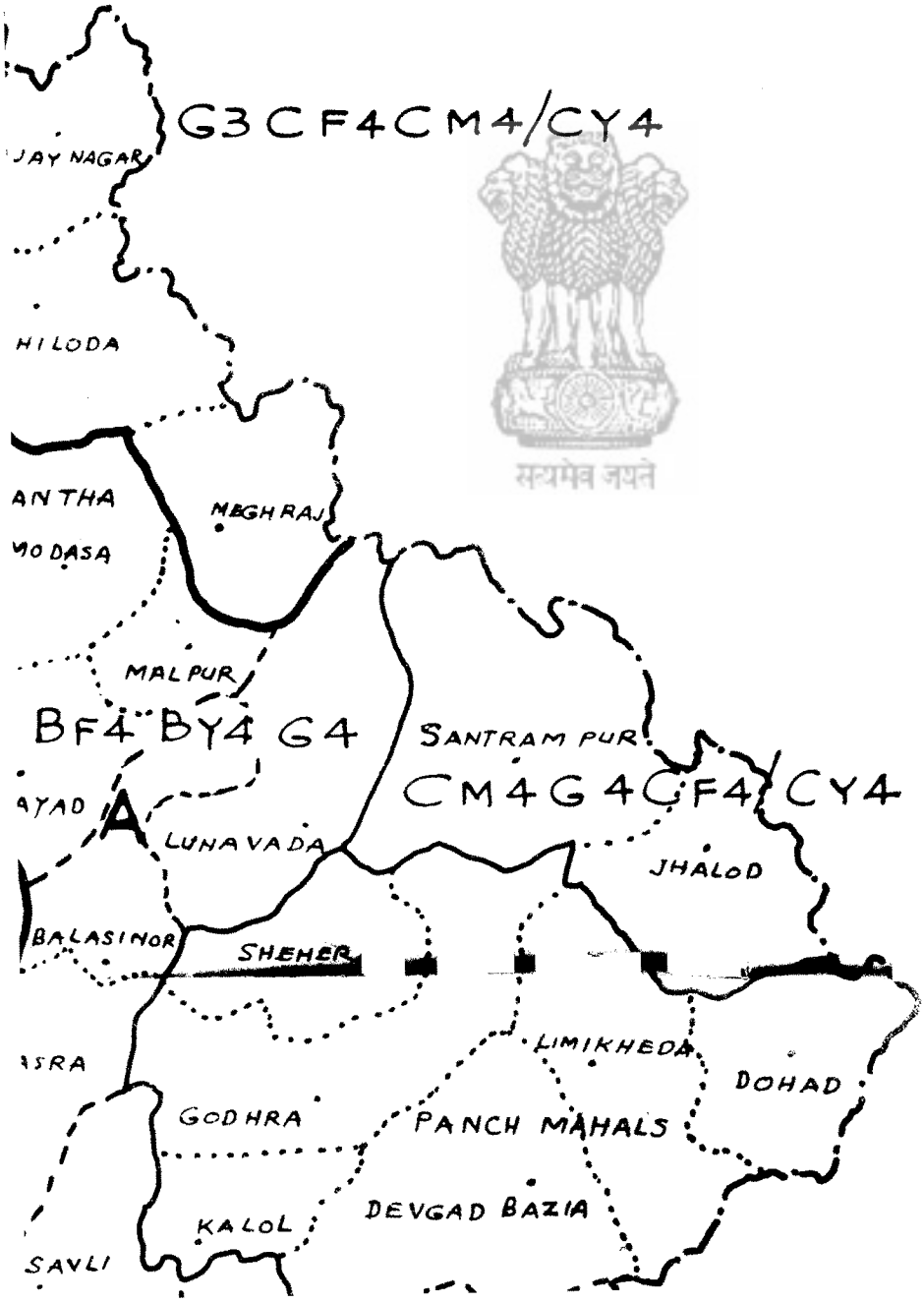
(1)	Pd1	PADDY COVERS MORE THAN 70 PERCENT OF GROSS CROPPED AREA OF THE TALUK
(2)	R2 Pu4 Pd4	RAGI (50 - 70 %) AREA OTHER PULSES (10 - 30%) AREA PADDY (10 - 30 %) AREA

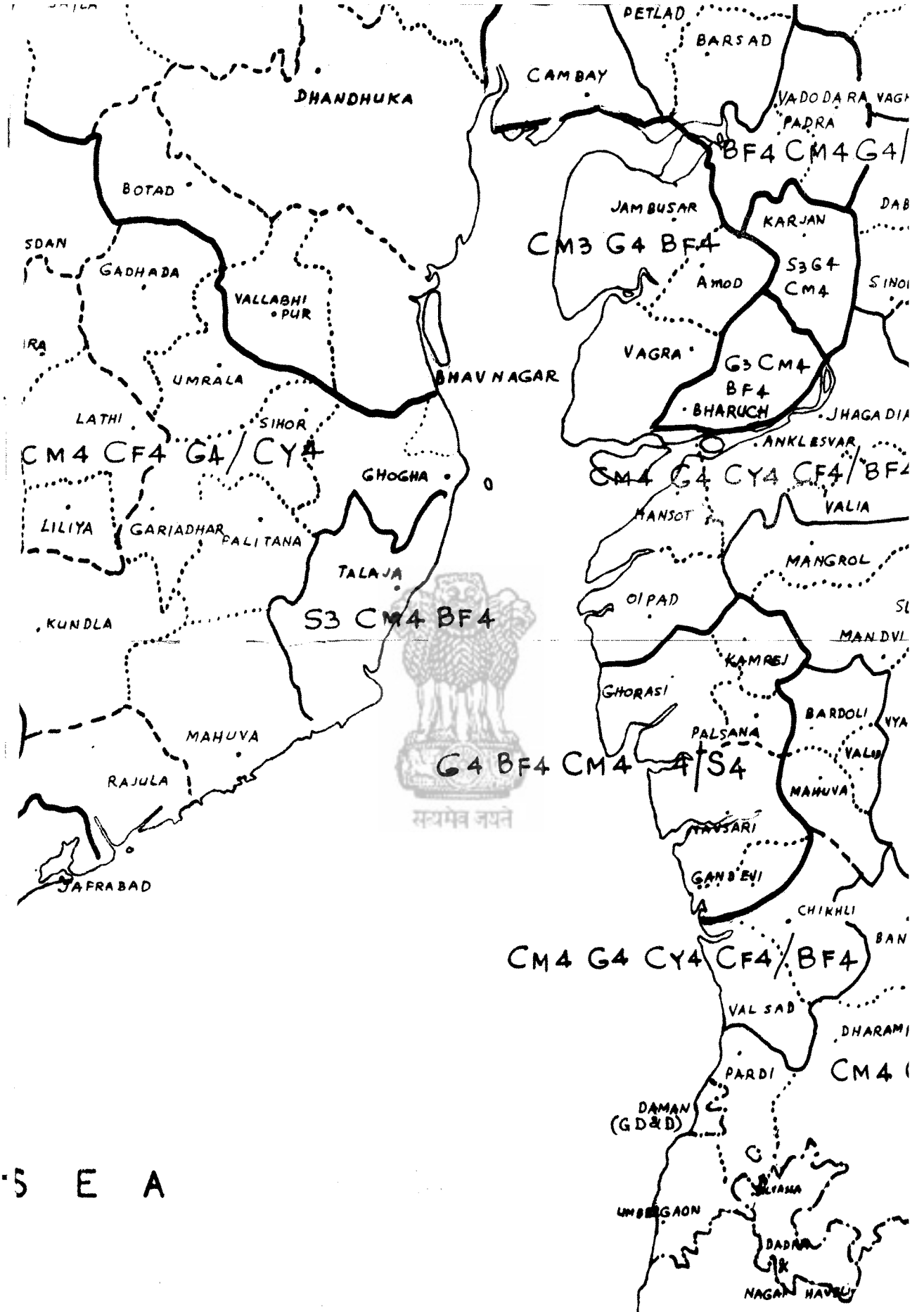
Based upon Survey of India ma


HALOL
CHHOTA UDAIPUR
JAMBUGHODA
ARAVAGHODIA
JABUGAM
MADHYA
PRADESH
4G4/BY4
SANKHEDA
DABHOI
NASVADI
CM3 G4 CF4
SINOR
TILAKWADA
NANDOD
DEDIA PADA
SAGBARA
NIZAR
SURAT
MANDVI
UCHHAL
SONGADH
VYARA
THE DANGS
AHWA
BANSDA
DHARAMPUR
CM4 CF4 G4/CY4
MAHARASHTRA

APPENDIX VII

RAJASTHAN





orial waters of India extend into the sea to a distance of twelve nautical miles from the appropriate base line.


S4CM4CF4G4/CY4
THARAD
DHANERA
BANAS KANTHA
DEESA
VAV.
G4CM4CF4S4/BF4/CY4
DANTA
PALANPUR
DEODAR
KHED BRAHMA
VADGAM
KANKREJ
SIDHPUR
VIJAY NAGAR
RADHANPUR
PATAN
KHERALU
IDAR
HARIJ
VISNAGAR
BHILODA
SAMI
CHANASMA
HIMATNAGAR
VIJAPUR
MAHESANA
SABARKANTHA
MODASA
PRANTIJ
DASADA
BF4BY4CM4G4
CM4CF4
G4/CY4
KADI
GANDHI-
NAGAR
CM4BF4B
KALOL
BAYAD
DEHGAM
VIRAMGAM
AHMADABAD
CITY
DHRANGADHRA
AHMADABAD
DASKROI
KAPADVANJ
BALASINOR
SANAND
LAKHTAR
URENDRA NAGAR
MEHMEDABAD
THASRA
CM4CF4CY4G4/S4/BF4
KHEDA
WADHWAN
NADIAD
G4CM4
CF4S4/
BF4/
CY4
DHOLKA
MATAR
MULI
ANAND
SAVLI
LIMBDI
BF3BY4CM4

ey of India map with the permission of the Surveyor General of India.

The territorial wat
measured from the


MUNDRA
MORVI
SURENDRA NA
JODIYA
MULI
DHROL
WANKANER
SAYLA
JAMNAGAR
PADDHARI
GHOTILA
M4 CF4 G4/CY4
RAJKOT
LALPUR
KHAMBHALIYA
KALAVAD
LODHIKA
S3 G4 CM4/CF4
JASDAN
GONDAL
KOTDA-SANGANI
JAMJODHPUR
JAM-KANDORNA
BHANVAD
BABRA
UPLETA
JETPUR
CM4 BF4 S4 G4 CY4/CF4
LATHI
RANAVAV
KUTIYANA
DHORAJI
S4 CM4 CF4
KUNKAVAV-VADIA
JUNAGADH
AMRELI
MANAVADAR
BHESAN
LILIYA
VANTHALI
KESHOD
MENDARDA
VISAVADAR
DHARI
KUNDLA
CM4 CF4 CY4 G4/S4/BF4
KHAMBHA
MANGROL
MALIA
TALALA
(GIR FOREST)
RAJULA
PATAN-VERAVAL
CM4 CF4 G4/CY4
UNA
JAFRABAD
KODINAR
DIU
(GOA, DAMAN AND DIU)
ARABIAN


PAKISTAN
VAV.
S3 G4 CM4/CF4
KHAVADA
KHADIR
BANNI
RAPAR
SANTALPUR
ADHOI
KUTCH
BHUJ
S4G4 CY4/CF4
ANJAR
BHACHAU
MALIYA
HALVAD
S3G4 CM4/CF4
MUNDRA
MORVI
SURENDRA NAG
JODIYA
MULI
DHROL
WANKANER

LEGEND

LIVESTOCK	SYMBOLS
CATTLE:	
MALES OVER 3 YEARS	Cm
FEMALES OVER 3 YEARS	Cf
YOUNGSTOCK 3 YEARS AND UNDER	Cy
BUFFALOES:	
MALES OVER 3 YEARS	Bm
FEMALES OVER 3 YEARS	Bf
YOUNG STOCK 3 YEARS AND UNDER	By
SHEEP	S
GOATS	G
HORSES/PONIES	H
MULES	M
DONKEYS	D
CAMELS	Ca
PIGS	P

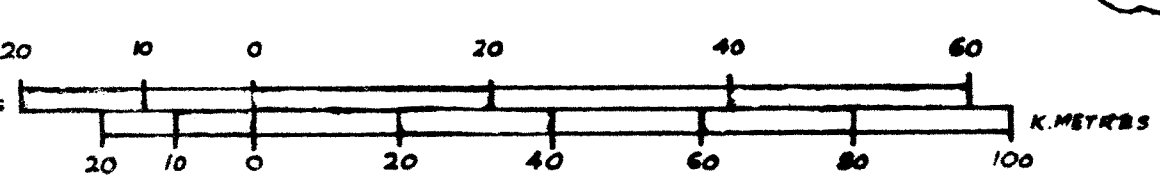
A DISTRIBUTION WHICH IS THE SAME OVER TWO OR MORE ADJOINING TALUKS IS CALLED A PATTERN, IF THE %AGE OF INDIVIDUAL CATEGORIES IS 10 OR MORE AND THE TOTAL IS NOT LESS THAN 70 PER CENT.

INTERVAL SUBSCRIPT	PERCENT OF TOTAL LIVE STOCK OF TALUK
1	GREATER THAN 70
2	50 - 70
3	30 - 50
4	10 - 30
5	LESS THAN 10

EXAMPLE:

LIVESTOCK PATTERN	Cm3 S4 G4
Cm3	30 - 50 %
S4	10 - 30
G4	10 - 30.

Based upon Survey of India m



REFERENCE

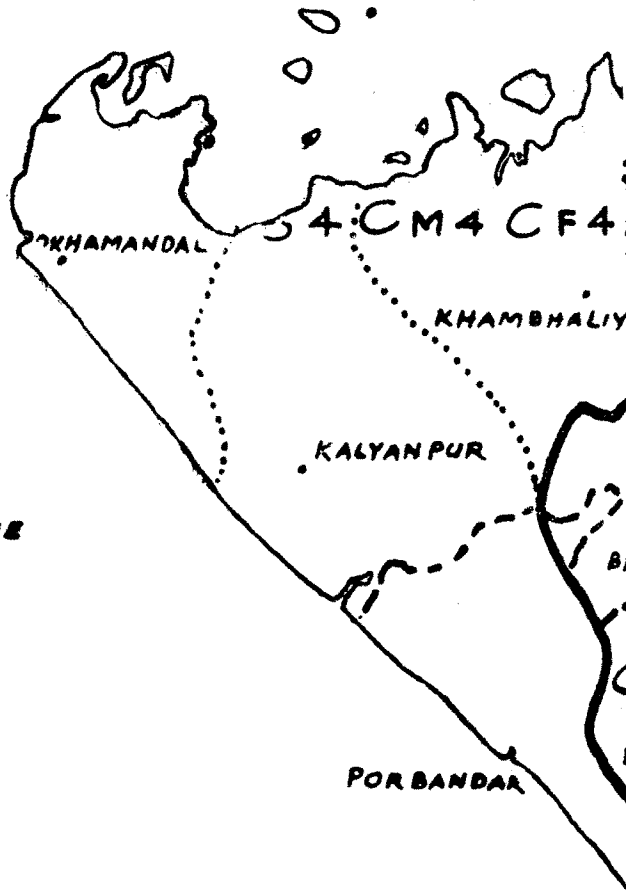
INTERNATIONAL BOUNDARY

STATE BOUNDARY

DISTRICT BOUNDARY

TALUK BOUNDARY

ZONE SUB-ZONE



LEGEND

LIVESTOCK	SYMBOLS
CATTLE :	
MALES OVER 3 YEARS	Cm
FEMALES OVER 3 YEARS	Cf
YOUNGSTOCK 3 YEARS AND UNDER	Cy
BUFFALOES :	
MALES OVER 3 YEARS	Bm
FEMALES OVER 3 YEARS	Bf
YOUNG STOCK 3 YEARS AND UNDER	By
SHEEP	S
GOATS	G
HORSES/PONIES	H
MULES	M
DONKEYS	D
CAMELS	Ca
PIGS	P

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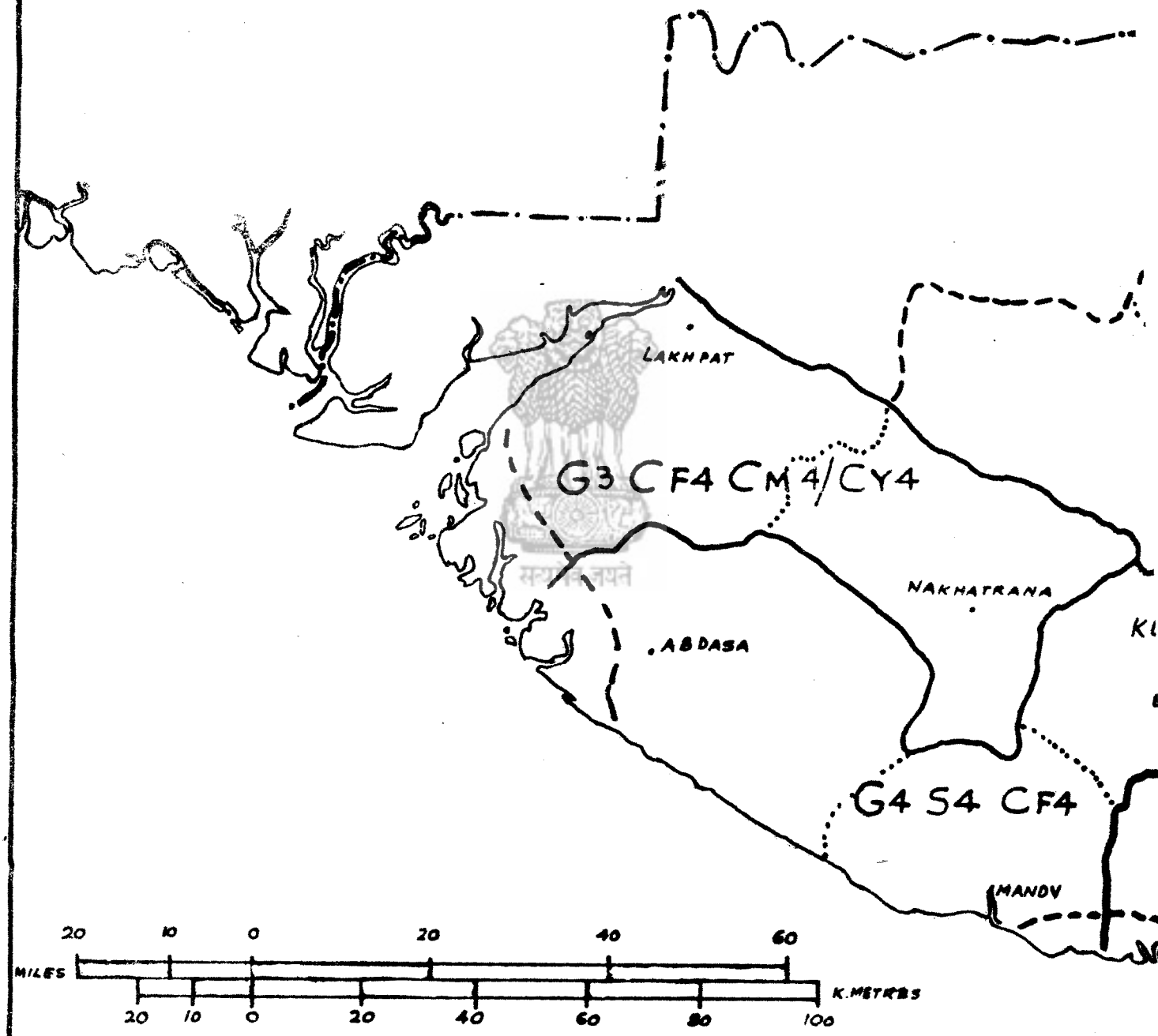
INTERVAL SUBSCRIPT	PERCENT OF TOTAL LIVE STOCK OF TALUK
1	GREATER THAN 70
2	50 - 70
3	30 - 50
4	10 - 30
5	LESS THAN 10

EXAMPLE :

GUJARAT

LIVESTOCK PATTERNS



REFERENCE

INTERNATIONAL BOUNDARY