NATIONAL COMMISSION ON AGRICULTURE
1976

RAINFALL AND CROPPING PATTERNS

Vol. I

ANDHRA PRADESH

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
ANDHRA PRADESH

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 combind 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 taluk or tehsil as unit of area. It covered several country using 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 to 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 tehsil 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, railfall, 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 rainall, 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 30cm 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, eg, bajra and small millets.

(iv) 5-10 cm pm for three consecutive months would be just sufficient for crops which have low water requirements eg, *moth* (*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, eg, A_2 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 rainall 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_2E_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 durnig 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 smybols with numerical subscripts has to be interpreted, a hypothetical example may be considered. $D_1\ E_3\ (A_2\ B_1\ C_1)\ C_1\ D_3$, 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 procedure 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 a zone is not considered a part of that zone.

2.6 If an identical distribution 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 Rainfall 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	Ju
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 taluk wise data were not available for the livestock Census, 1972, those of 1966 Census as published by the States have been used. The animals considered

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

for livestock analysis are shown in Table 3 together with their symbols.

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 areas of the country. 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 Natonal Atlas Organisation
temperature	Climatological Tables of Observatories in India, India Meteorological Departments, 1931-1960 normals
evapotranspiration	scientific Report No. 136 of the India Meterological 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 (1969-70) 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 (per cent of Gross Cropped Area)

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 show in three digit Arabic numerals within brackets.

3 GENERAL FEATURES

3.1 The State has an area of 276,754 sq km and consists of 21 districts with an average area of 13,179 sq km. Frequency distribution of district areas is shown below :

range of areas in (000sq km)	6-8	8-10	10-12	12-14	14-16	16-18	18-20
no. of districts	3	3	3	3	4	2	3

3.2 The total number of taluks including a few independent sub-taluks is 195 and the average area of a taluk is about 1400 sq km. The areas of individual taluks vary from 225 to 3000 sq km. About 30 per cent of the taluks have areas of less than 1000 sq km and most of these are in coastal districts from Srikakulam to krishna. Nine of 10 taluks with less than 500 sq km in area are in the coastal districts, West Godavari (7), Srikakulam (1) and krishna (1). Fifty-five per cent of the taluks have areas between 1000 and 2000 sq km.

Elevation

3.3 The State can be divided into three regions—coastal area, Rayalaseema and Telangana regions for discussion on orography. The coastal belt is small in width with elevations ranging between sea-level and and 150-200 masl (metres above sea-level). The rise is rapid in the interior and most of it is between 200 to 800 masl. At the western and the northern

boundary of Srikakulam, Visakhapatnam and East Godavari districts, elevations vary between 1200 and 1800 masl. The Rayalaseema area is plateau with elevations between 150 and 900 masl in general except in Chittoor district. Excluding a few eastern taluks, elevations in Chittor district range between 600 and 1200 masl. The highest elevations are between 1000 and 1200 masl in Punganur, Chandragiri, Madanapalle and Vayalpad taluks of Chittoor district and Rajampet of Cuddapah district. Telangana region is also an elevated plateau. In this area, the minimum elevation is 150 masl and maximum 650 masl. Considering the State as a whole, the maximum and minimum elevations over the area east of longitude 79°E range between 300 and 100 masl. The north-western belt from Yellavaram (East Godavari district) to Parvathipuram and Pathapatnam has the highest elevations between 1200 and 1800 masl.

Population

3.4 The total population of the State is 43.5 million with an average population density of 157 per sq km. Only two districts of Hyderabad and West Godavari have population density exceeding 300. Adilabad has the lowest population density of 80 and the remaining districts have population density ranging between 100 and 270.

3.5 About 40 per cent of the taluks of the coastal districts have population density exceeding 300 and 50 per cent of the taluks of Ongole and Nellore districts to the west have low population density less than 100. In Rayalaseema region the taluk with the highest population density is Chittor being 268 and except for two all the rest have population density of less than 200. In Telengana region, Hyderabad (urban) has the highest population density of 6929. Forty per cent of the taluks have a population density ranging between 100 and 150 and about a fourth of the taluks have a population density of less than 100. The frequency distribution of population density of taluks together with district density is given in table 4.

TABLE 4

Density of Population (per Sq KM.)

	No. of Taluks	District density	Percentage of rural population	No. of taluks with Population density of								
				L-100	101 150	151 200	201 300	301 500	501 750	751 1000	1001 1500	71500
1	2	3	4	5	6	7	8	9	10	11	12	13
1 Srikakulam	11	268	89	—	—	2	3	6	—	—	—	—
2 Visakhapatnam	11	203	78	2	—	—	4	4	—	1	—	—
3 East Godavari	14	285	81	2	—	—	2	6	4	—	—	—
4 West Godavari	8	305	82	1	1	—	2	2	2	—	—	—
5 Krishna	10	283	73	—	—	3	3	3	1	—	—	—
6 Guntur	8	251	75	1	1	1	1	2	2	—	—	—
7 Ongole	9	112	89	4	2	1	1	1	—	—	—	—
8 Nellore	9	124	84	4	3	—	2	—	—	—	—	—
9 Chittoor	11	151	87	—	6	4	1	—	—	—	—	—
10 Cuddapah	9	103	86	5	2	2	—	—	—	—	—	—
11 Anantapur	11	111	82	4	5	2	—	—	—	—	—	—
12 Kurnool	11	113	80	5	4	1	1	—	—	—	—	—
13 Mahbubnagar	12	105	91	3	8	1	—	—	—	—	—	—
14 Hyderabad	9	360	34	—	6	1	1	—	—	—	—	1
15 Medak	8	154	91	—	3	5	—	—	—	—	—	—
16 Nizamabad	7	163	84	—	3	2	2	—	—	—	—	—
17 Adilabad	10	80	84	8	2	—	—	—	—	—	—	—
18 Karimnagar	7	165	89	1	—	3	3	—	—	—	—	—
19 Warangal	6	146	87	1	2	2	—	1	—	—	—	—
20 Khammam	7	87	86	5	1	—	1	—	—	—	—	—
21 Nalgonda	7	128	93	1	4	2	—	—	—	—	—	—
Total	195	157	81	47	53	32	27	25	9	1	—	1
Coastal Andhra	80			14	7	7	18	24	9	1	—	—
Rayalaseema	42			14	17	9	2	—	—	—	—	—
Telangana	73			19	29	16	7	1	—	—	—	1

Land Use

3.6 Forests account for 24 per cent of the geographical area, land put to non-agricultural uses 15 per cent and fallow lands 9 per cent. The net sown area is 42 per cent of geographical area and is nearly the same in each of the three regions. Land use percentages to the total geographical area is indicated in table 5.

TABLE 5

Land Use Statistics (Percent of total reporting area)

District	Forests	Barren & uncultur-able land	Land put to non agri. uses	Cultur-able waste	Perma-nent pastures & other grazing land	Land under misc. trees, crops & groves not included in net area sown	Current fallows	Other fallow lands	Net area sown	Area sown more than once	Col. II an per cent of col. 10
1 Srikakulam	16	16	7	5	2	1	0·4	3	50	9	18
2 Vishakhapatnam	34	7	15	4	1	2	1	2	34	6	18
3 East Godavari	27	7	8	10	3	2	3	2	38	14	37
4 West Godavari	12	8	12	6	3	1	0·3	4	55	17	31
5 Krishna	9	7	11	6	4	2	2	3	58	20	33
6 Guntur	15	7	9	4	4	3	1	1	58	20	34
7 Ongole	26	6	6	5	6	2	5	6	38	4	10
8 Nellore	19	9	13	9	12	2	2	6	27	5	20
9 Kurnool	21	6	5	5	0·3	0·1	3	4	57	6	10
10 Anantapur	10	10	8	8	1	1	12	6	44	1	2
11 Cuddapah	32	5	9	8	4	1	3	2	30	2	7
12 Chittoor	30	12	9	5	3	2	5	4	30	4	13
13 Hyderabad	9	7	10	2	9	2	11	4	47	1	2
14 Nizamabad	22	9	7	3	6	1	8	4	40	3	7
15 Medak	25	6	5	3	5	2	2	3	50	1	2
16 Mahbubnagar	16	5	5	2	4	1	11	2	54	2	4
17 Nalgonda	6	7	6	3	7	1	20	6	45	13	3
18 Warangal	22	6	7	1	7	1	14	2	39	8	20
19 Khammam	53	6	4	2	4	1	38	1	28	3	11
20 Karimnagar	21	8	7	2	5	1	14	2	40	4	10
21 Adilabad	44	7	4	2	3	1	3	2	36	1	3

3.7 The percentage of area under forests to total reporting area in the whole State is 24 per cent, the area varying from 21 per cent in Rayalaseema to 26 per cent in Telengana region. This area under forests in individual districts varies considerably from 6 per cent in Nalgonda to 53 per cent in Khammam. There are 9 taluks in the State with more than 70 per cent of geographical area under forests, and 10 per cent of the taluks have more than 50 per cent of geographical area under forests.

3.8 Barren lands are 10 to 12 per cent in Anantapur and Chittor districts, 16 per cent in Srikakulam and 5 to 9 per cent elsewhere. Current fallow areas are significant in six districts covering 11 to 20 per cent of geographical area. Other fallow lands are generally less than 5 per cent. Net sown area varies between 27 and 58 per cent and area sown more than once as per cent of net sown area is about a third in the coastal districts of East Godavari, West Godavari, Krishna and Guntur.

Soils

3.9 In Rayalaseema region the main soil types are red sandy and mixed red and black. In Kurnool dis-

trict, mixed red and black soils predominate whereas pockets of deep black soils are present in Cuddapah and Kurnool districts. In telengana soils are red sandy and deep/medium black. A belt of red loamy soils runs across most of the northern boundary from Asifabad taluk. Medium black soils belt is present along the western boundary. A significant belt of deep black soils is an important feature of Khammam, Warangal, Karimnagar and Adilabad districts. The coastal taluks have coastal or deltaic alluvium. Pockets of coastal sand are also present. Deltaic alluvium is the main soil in East Godavari. In the interior of the coastal districts, red sandy soils together with mixed red and black or deep black soils are present. Laterite soils are present only in small pockets.

Irrigation

3.10 The total area irrigated in 1969-70 was 32 million ha which accounts for 28 per cent of the net sown area. In Rayalaseema and Telangana the percentage of net area irrigated is 17 per cent as compared to 50 per cent in coastal Andhra. The district with maximum area under irrigation is West Godavari with 74 per cent. The percentage area irrigated is quite low in some of the coastal taluks such as Kaikalur and Bheemavaram. Tanuku and Bandar taluks are almost completely irrigated. Outside coastal Andhra area, the number of taluks with 50 per cent or more area under irrigation is small being confined to a few taluks in Chittoor and Cuddapah districts. For the State as a whole nearly 50 per cent of the area irrigated is by canals, the percentage being 60 for coastal Andhra. Fifty per cent of the area in Telengana is irrigated by tanks. Wells form a significant source in Rayalaseema.

Temperature

3.11 Normals of daily maximum, minimum and mean temperatures for 19 stations in the State are given in Tables 6, 7 and 8. During the rainy months of July to September, temperature variations are small being less than a degree C.

TABLE 6

Normals of Daily Maximum Temperature (°C)

Station	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annua
1 Kalingapatnam	27·4	29·6	31·9	33·1	33·9	33·6	31·6	31·9	31·8	30·7	28·5	26·8	30·9
2 Vizag	27·7	29·2	31·2	32·8	34·0	33·7	31·7	32·0	31·6	30·9	29·3	27·7	31·0
3 Nidadavolu	29·8	32·1	34·2	35·9	38·3	36·1	31·0	30·7	31·4	30·8	30·3	29·5	32·5
4 Rentachintala	31·2	34·1	37·5	39·6	41·5	37·8	34·1	33·9	33·4	32·9	30·8	29·9	34·7
5 Vijayawada	30·1	32·9	35·6	37·8	39·7	37·5	32·6	32·1	32·4	31·5	30·7	29·7	33·6
6 Masulipatnam	27·8	29·6	31·9	34·0	36·5	36·4	32·6	32·2	31·8	30·8	29·0	27·8	31·7
7 Ongole	28·7	30·6	32·3	34·4	38·2	37·4	34·1	34·1	33·7	31·7	29·8	28·6	32·8
8 Nellore	29·8	32·0	34·5	37·1	39·6	38·2	35·6	35·2	34·7	32·5	29·6	28·7	34·0
9 Ramagundam	31·1	34·1	37·7	40·3	42·8	38·6	32·1	31·3	32·0	32·5	30·7	30·2	34·5
10 Nizamabad	30·0	32·6	36·4	39·2	41·5	36·2	30·5	30·1	30·6	31·5	29·7	28·9	33·1
11 Hanamkonda	29·9	32·4	35·9	38·3	40·8	36·5	31·2	30·9	31·2	31·7	29·9	29·0	33·1
12 Bhadrachalam	30·9	34·0	37·2	39·3	40·8	37·6	31·9	31·3	32·2	32·0	30·5	29·7	34·0
13 Begumpet	28·6	31·2	34·8	36·9	38·7	34·1	29·8	29·5	29·7	30·3	28·7	27·8	31·7
14 Khammam	31·0	33·6	36·8	39·0	41·3	37·6	32·6	32·2	32·6	32·5	30·6	30·1	34·2
15 Mahbubnagar	29·2	32·3	35·6	37·5	38·4	33·8	29·	29·5	30·3	30·4	29·2	28·4	32·0
16 Kurnool	31·3	34·3	37·5	39·3	40·0	35·6	32·5	32·1	31·9	32·4	31·0	30·3	34·0
17 Anantapur	30·4	33·4	36·8	38·4	38·1	34·7	32·4	32·4	32·5	31·4	30·0	29·1	33·3
18 Cuddapah	30·9	34·3	37·7	39·8	40·3	37·0	34·5	34·0	33·3	32·5	30·4	29·5	34·5
19 Arogyavaram	27·1	30·1	33·2	34·7	34·7	32·0	30·0	30·0	29·8	28·3	26·5	34.5	30.2

TABLE 7

Normals of Daily Minimum Temperature (°C)

Station	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1 Kalingapatnam	17·7	19·8	22·8	25·7	27·4	27·1	25·9	26·0	25·8	24·5	20·4	17·6	23·4
2 Vizag	17·5	19·3	22·6	25·9	27·8	27·4	26·0	26·0	25·6	24·5	21·2	18·3	23·5
3 Nidadavolu	17·8	19·3	22·3	25·2	26·9	26·3	24·9	24·9	24·9	23·8	20·6	18·2	22·9
4 Rantachintala	17·3	19·9	23·0	26·1	28·6	27·8	25·3	25·6	24·8	23·2	19·6	16·8	23·2
5 Vijayawada	19·1	20·0	22·3	25·6	27·7	27·3	25·3	25·1	25·2	24·2	21·1	19·1	23·5
6 Masulipatnam	19·4	20·8	22·9	25·9	28·0	27·4	25·7	25·8	25·7	24·9	22·1	19·8	24·0
7 Ongole	19·7	20·9	23·3	26·0	28·0	28·4	26·5	26·3	25·8	24·7	21·8	19·9	24·3
8 Nellore	20·0	21·1	23·1	25·7	27·8	28·2	26·7	25·5	26·0	24·7	22·3	20·4	24·4
9 Ramagundam	16·1	18·8	22·7	26·9	29·7	28·2	24·7	24·4	24·4	22·8	17·5	15·0	22·6
10 Nizamabad	15·3	17·5	21·0	24·8	27·7	25·4	23·2	23·0	22·7	20·6	16·2	13·8	20·9
11 Hanamkonda	17·2	19·2	22·2	25·3	28·1	26·7	24·4	24·2	23·9	22·2	18·4	16·1	22·3
12 Bhadrachalam	16·7	19·0	22·8	25·7	28·0	27·5	24·9	24·6	24·4	23·0	18·2	15·7	22·5
13 Begumpet	14·6	16·7	20·0	23·7	26·2	24·1	22·3	22·1	21·6	19·8	16·0	13·4	20·0
14 Khammam	17·6	20·0	23·1	25·9	28·1	27·2	24·9	24·7	24·4	22·9	19·1	16·7	22·9
15 Mahbubnagar	16·4	17·9	21·2	24·5	26·2	24·0	22·5	22·2	22·1	21·3	18·1	16·6	21·1
16 Kurnool	17·0	19·3	22·5	26·0	27·2	25·0	23·8	23·5	23·3	22·4	19·2	16·6	22·2
17 Anantapur	17·3	18·6	21·6	25·7	25·8	24·7	23·7	23·5	23·1	22·5	19·4	17·2	21·9
18 Cuddapah	19·2	21·0	24·0	27·4	28·7	26·9	25·6	25·4	25·0	23·9	21·3	19·1	24·0
19 Arogyavaram	15·3	16·7	19·1	22·0	23·5	22·7	21·7	21·7	21·2	20·1	17·6	15·5	19·8

TABLE 8

Normals of Daily Mean Temperature (°C)

Station	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1 Kalingapatanam	22·6	24·7	27·3	29·4	30·7	30·4	28·8	29·0	28·8	27·6	24·5	22·2	27·2
2 Vizag	22·6	24·3	26·9	29·4	30·9	30·6	28·9	29·0	28·6	27·7	25·3	23·0	27·3
3 Nidadavolu	23·8	25·7	28·3	30·6	32·6	31·2	28·0	27·8	28·2	27·3	25·4	23·9	27·7
4 Rantachintala	24·3	27·0	30·3	32·9	35·1	32·8	29·7	29·8	29·1	28·1	25·2	23·4	29·0
5 Vijayawada	24·6	26·5	29·0	31·7	33·7	32·4	29·0	28·6	28·0	27·9	25·9	24·4	28·6
6 Masulipatnam	23·6	25·2	27·4	30·0	32·3	32·0	29·2	29·0	28·8	27·9	25·6	23·8	27·9
7 Ongole	29·2	25·8	27·8	30·2	33·1	32·9	30·3	30·2	29·8	28·2	25·8	24·3	28·6
8 Nellore	24·9	26·6	28·8	31·4	33·7	33·2	31·2	30·9	30·4	28·6	26·0	24·6	29·2
9 Ramagundam	23·6	26·9	30·2	30·6	36·3	33·4	28·4	27·9	28·2	27·7	24·1	22·6	28·6
10 Nizamabad	22·7	25·1	28·7	32·0	34·6	30·8	26·9	26·6	26·7	26·1	23·0	21·4	27·0
11 Hanamkonda	23·6	25·8	29·1	31·8	24·5	31·6	27·8	27·6	27·6	27·0	24·2	22·6	27·7
12 Bhadrachalam	23·8	26·5	30·0	32·5	34·4	32·6	28·4	28·0	28·3	27·5	24·4	22·7	28·3
13 Begumpet	21·6	24·0	27·4	30·3	32·5	29·1	26·1	25·3	25·7	25·1	22·4	20·6	25·9
14 Khammam	24·3	26·8	30·0	32·5	34·7	32·4	38·8	28·5	28·5	27·7	24·9	23·4	28·6
15 Mahbubnagar	22·8	25·1	28·4	31·0	32·3	28·9	26·2	25·9	26·2	25·9	23·7	22·5	26·6
16 Kurnool	24·2	26·8	30·0	32·7	33·6	30·3	28·2	27·8	27·6	27·4	25·1	23·5	28·1
17 Anantapur	23·9	26·0	29·2	32·1	32·0	29·7	28·1	28·0	27·8	27·0	24·7	23·2	27·6
18 Cuddapah	25·1	27·7	30·9	33·6	34·5	32·0	30·1	29·7	29·2	28·2	25·9	24·3	29·3
19 Arogyavaram	21·2	23·4	26·2	28·4	29·1	27·4	25·9	25·9	25·5	24·2	22·1	20·5	25·0

Potential Evapotranspiration

3.12 In Table 9, potential evapotranspiration (PE) values are given for 20 stations in the State. The highest values of PE are over Rayalaseema area and are about 180 cm annually. In Telengana, annual PE values are between 160 to 170 cm. Annual PE of coastal stations is about 150 cm rising in the interior to 170-180 cm

3.13 Moisture Index has been computed using Penman's formula and Thornthwaite's approach. The values are negative. These range numerically between 30 and 55 in the coastal areas and Telangana and 55 to 70 in Rayalaseema. Most of the State comes under the semi arid zone but for Anantapur and Kurnool these values are —70 and —63 respectively, and these areas could be regarded as arid.

TABLE 9

Normal Monthly and Annual Potential Evapotranspiration (PE) (mm)

Station	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct.	Nov	Dec	Annual
						Coastal Andhra Pradesh							
Kalingapatnam	101·6	113·0	156·0	164·5	173·5	143·4	127·7	124·3	114·1	116·2	106·5	99·0	1540·1
Visakhapatnam	95·2	109·3	154·7	162·8	166·2	128·3	118·4	120·0	110·0	116·3	105·7	94.4	1481.8
Kakinada	111·9	123·4	167·7	176·3	194·0	169·0	136.0	137·2	124·5	124·9	116·1	107·9	1689·5
Nidadavolu	106·1	116·4	149·7	151·1	162·3	150·2	114·3	109·8	105·4	100·2	101·9	98·9	1467·0
Rentachintala	110.9	131.8	184.5	195·8	214.0	187.5	151.9	150.8	127.1	120.5	101·8	98.00	1775.1
Gannavarm	125.1	136·3	181.3	197·1	227·0	198·7	147·5	138·5	126·7	120·8	121·2	115·9	1836.7
Masulipatam	111·7	120·8	161·9	177·0	205·0	181·4	144·0	140·3	124·6	121·3	109·2	106·5	1704·4
Ongole	110·1	124.0	162·9	172·0	193·7	171·0	139·7	146·1	130 0	116·6	107·0	101·4	1674·9
Nellore	110·7	126·4	172·5	184·3	197·0	169·5	152·2	152·9	142·1	122·2	99·2	98·8	1728·3
						Telangana							
Rangundam	107·8	128·4	178·9	199·2	224·3	183·5	124·4	117·2	115·3	123·2	104·4	92·5	1699·6
Nizamabad.	98·8	115·6	157·9	176·6	201·8	168·0	126·6	124·3	114·9	120·9	97·9	87·6	1591·4
Hanamkonda	113.3	134.6	184.0	204·8	233·5	185·7	136·7	134·9	123·6	131·8	106·5	97·6	1787·5
Bhadrachalam	106·5	125·9	176·3	191·8	205·0	165·3	116·5	188·9	105·8	108·9	99·6	91·5	1602.5
Hyderabad	109·8	129·5	181·5	197·8	219·9	196·4	140·4	135·0	119·3	128·6	104·1	98·6	1756·8
Khammam	111·8	131·4	179·7	19·0	211·0	168·7	129·0	122·8	115·1	115·6	102·0	97·9	1676·6
Mahbubnagar	119·5	133·1	176·8	183·1	198·0	157·5	123·9	119·1	116·7	120·5	116·8	110·5	1675·9
						Rayalaseema							
Kurnool .	117·6	134·8	180·8	194·7	221·4	189·8	161·4	154.6	133·5	125·7	108·3	104·1	1827·4
Anantapur	131·0	142·6	190·4	196·7	199·0	178·5	160·9	558·1	142·7	124·2	117·8	114·5	1857·1
Cuddapah	131·1	156·0	208·8	209·5	205·1	167·1	148·0	143·9	131·7	124·0	105·8	103·0	1834·4
Arogyavaram	102·6	122·4	168·8	162·4	167·5	149·5	137·0	139·1	125·1	101·4	91·1	88·7	1556·2

4 RAINFALL ZONES, THEIR CROPPING AND LIVESTOCK PATTERNS

4.1 The State is divided into 28 rainfall zones. Three taluks which could not be grouped with these are shown as special I to II. These are indicated below together with the number of taluks included in each of them and their total approximate areas :—

Rainfall	*Rainfall pattern*	*No. of taluks with their total area in sq km*
I	$E_4(D_3E_1)B_2C_1E_1$	5 (6804)
II	$E_4(C_1D_2E_1)C_2E_2$	5 (10432)
III	$E_4(C_1E_2E_1)B_1C_1E_2$	2 (3419)
IV	$E_4(C_1D_2E_1)B_2E_2$	3 (4724)
V	$E_4(C_1D_3)D_1E_3$	4 (7014)
VI	$E_4(C_1D_3)D_2E_2$	2 (3062)
VII	$E_4(C_1D_3)C_2E_2$	2 (5545)
VIII	$E_4(C_1D_3)A_1B_1C_1E_1$	3 (4066)
IX	$E_4(C_2D_2)D_2E_2$	3 (3237)
X	$E_4(C_2D_2)C_2E_2$	2 (3536)
XI	$E_4(C_3D_1)D_1E_3$	37 (56821)
XII	$E_4(C_3D_1)C_1D_1E_2$	3 (5686)
XIII	$E_4(C_3D_1)C_2E_2$	4 (3918
XIV	$E_4(C_4)C_1D_1E_2$	8 (6934)

Rainfall	*Rainfall pattern*	*No. of taluks with their total area in sq km*
XV	$E_4(C_4)B_1C_1E_2$	10 (6301)
XVI	$E_4(B_1C_3)D_1E_3$	23 (35558)
XVII	$E_4(B_1C_3)C_1D_1E_2$	8 (7941)
XVIII	$E_4(B_2C_2)D_1E_3$	8 (16488)
XIX	$E_4(B_3C_1)D_1E_3$	5 (4936)
XX	$E_4(A_1B_1C_2)D_1E_3$	8 (12705)
XXI	$E_4(A_2B_1C_1)D_1E_3$	2 (4000)
XXII	$D_1E_3(C_1D_4E_2)D_1E_3$	3 (4862)
XXIII	$D_1E_3(C_1D_2E_1)C_1D_1E_2$	6 (11261)
XXIV	$D_1E_3(C_1D_3)C_2E_2$	4 (7008)
XXV	$D_1E_3(C_2D_2)C_2D_1E_1$	4 (4790)
XXVI	$D_1E_3(C_4)C_1D_1E_2$	22 (17225)
XXVII	$D_2E_2(B_1C_3)C_1D_1E_2$	2 (3719)
XXVIII	$D_2E_2(B_3C_1)C_1D_1E_2$	4 (6849)
Special I	$E_4(A_1B_1C_2)C_1D_1E_2$	1 (1616)
Special II	$E_4(A_2B_2)D_1E_3$	1 (3105)
Special III	$D_1E_3(C_2D_2)C_1D_1E_2$	1 (756)

Rainfall Zone I—E_4 (D_3 E_1) B_2 C_1 E_1

4.2 The district, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_1	Nellore	,,
Pd_2 Jr_4/B_4	Gudur	,,
	Venkatagiri	,,
Pd_3 Jr_3 Pu_4/Mt_4	Atmakur	,,
Jr_3 Pu_4 Pd_4	Rapur	,,

4.3 The total area of the zone is 6,804 sq km. The areas of taluks vary between 1,100 and 1,700 sq km. The population density is not high. Nellore has an average density of 278 per sq. km. Rapur and Atmakur have a population density of less than 100.

4.4 Nellore and Gudur taluks are practically at sea level while Venkatagiri has an elevation of 1100 masl. The elevations in Rapur and Atmakur vary between 140 and 550 masl.

4.5 Forests account for about 40 per cent of the geographical area in Rapur and Venkatagiri taluks and land not available for cultivation is between 15 to 30 per cent. Cultivable waste is 10-15 per cent in Rapur and Atmakur taluks and negligible elsewhere. Pasture lands in this zone occupy 10 to 25 per cent of area. The sown area is only 17 per cent in Venkatagiri and in the rest of the zone it ranges from 25 to 40 per cent.

4.6 Ninetyone per cent of area in Nellore is irrigated and 75 to 80 per cent in Gudur and Venkatagiri taluks whereas it is only 40 per cent in Atmakur and 25 per cent in Rapur. Nellore and Gudur have deltaic or coastal alluvium. Red Sandy and mixed red and black soils prevail elsewhere.

4.7 The average rainfall of the zone is about 100 cm. in 40-50 rainy days. November is the month of maximum rainfall and October and November together account for 50 per cent of the annual rainfall. During the months of June to September rainfall is only 5-10 cm pm. or less. October and November get good rainfall of 20-30 cm pm and in December it is only 10-20 cm.

4.8 Paddy is the dominant crop of the zone occupying 90 per cent of cropped area in Nellore and about 60 per cent each in Gudur and Venkatagiri taluks. In the remaining two taluks, Jowar (rabi) is more important with 30 to 45 per cent area while paddy covers only 15 to 30 per cent area.

4.9 Yield data are available for the district as a whole, and these are given in Table 10. Rice yields are low considering that the crop is irrigated. The yields of jowar kharif and rabi and small millets are much lower than all-India. Yield of bajra is twice of all-India but the area is not large.

4.10 Sheep generally dominate among the livestock except in Nellore and Gudur where cattle are more important. In Nellore, the livestock pattern is cm_4 Cf_4 Cy_4 Bf_4 G_4/By_4 and Gudur based on neighbourhood data also, it is S_4 G_4 Cm_4 Cy_4 Bf_4. In the rest of the zone, livestock pattern is S_4 G_4 Cf_4 Cm_4.

TABLE 10

Area and Relative Yield Index values of Crops in Zone I

Crop		Area ('000 ha)	R Y I*
rice	winter	114	107
	summer	83	64
	total	197	101
jowar	kharif	21	60
	rabi	75	79
	total	96	68
bajra		26	211
small millets		30	69
total pulses		28	32

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

Rainfall Zone II—$E_4(C_1D_2E_1)C_2E_2$

4.11 The districts, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Jk_4 Mt_4 B_4 O_4/Pu_4	Podili	Ongole
	Kanigiri	,,
	Darsi	,,
Mt_3 B_4 Pd_4 Jk_4/Gn_4	Markapur	,,
Mt_4 B_4 Pd_4 Jk_4 Ch_4	Vinukonda	Guntur

4.12 The area of the zone is 10,432 sq km and the areas of all the taluks exceed 1000 sq km individually. The highest population density is 103 per sq km in Podili and less than 100 in the rest of the zone.

4.13 The maximum elevation in the zone is in Markapur being 870 masl; the elevations generally vary between 100 to 600 masl except in Podili which is at sea-level.

4.14 Markapur taluk has about 60 per cent of area under forests and Vinukonda and Kanigiri 20-25 per cent. Land not available for cultivation is 10 to 15 per cent and cultivable waste is 3-10 per cent. Fallow lands account for 20 per cent in Darsi and 10-15 per cent in Markapur and Kanigiri. The net sown area is only 20-25 per cent in Markapur and Kanigiri and 40-60 per cent elsewhere.

4.15 The annual rainfall in the zone is 65-70 cm in 40 rainy days. October is the month of maximum rainfall and together with November accounts for 40 per cent of annual rainfall. Over most of this zone there are 3 months from September with rainfall of 10-20 cm pm.

4.16 The main crops are jowar (kharif), small millets and bajra though some rice (about 10 per cent of total cropped area) is also grown in Vinukonda.

4.17 Since four of the five taluks of this zone are in Ongole district, the yields of the main crops in Ongole are given in Table 11. Only the yield of bajra is above all-India.

4.18 Sheep account for a large percentage (over 30) of livestock followed by goats and female buffaloes. The livestock pattern is S_3 G_4 Bf_4 By_4.

TABLE 11

Area and Relative Yield Index Values of Crops in Zone II

Crops	Area ('000 ha)	RYA*
jowar (kharif)	89	51
small millets	120	70
bajra	58	162
paddy	77	90

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

Rainfall Zone III—$E_4(C_1D_2E_1)B_1C_1E_2$

4.19 The district, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Jr_4 Mt_4 Pd_4 To_4 F_4 B_4 R_4	Kandukur	Ongole
To_4 Mt_4 Jr_4 F_4/Pd_4 B_4	Ongole	,,

4.20 This is a small zone consisting of two taluks with an area of 3419 sq km. The population density in Kandukur and Ongole is 136 and 223 per sq km respectively.

4.21 The maximum elevation in Kandukar is less than 200 masl while in Ongole it is 640 masl.

4.22 Land not available for cultivation is 15 per cent, fallow lands 10 per cent and pastures 5—10 per cent. The net area sown is 50 per cent in Kandukur and 60 per cent in Ongole.

4.23 Kandukur taluk has 20 per cent of area under irrigation and Ongole about 10 per cent. Soils are coastal alluvium or sandy. Mixed red and black soils or deep black soils are present in patches.

4.24 The annual rainfall of the zone is 90 cm in 45 rainy days. The month of maximum rainfall is October and together with November account for 45 per cent of the annual rainfall. There are three consecutive months September, October and November which receive more than 10 cm pm rainfall.

4.25 All the crops in the patterns have areas in 10 to 20 per cent interval. Jowar and paddy occupy each 20 per cent of cropped area in Kandukur and Tobacco 22 per cent in Ongole. Small millets occupy about 10 to 15 per cent of cropped area. Yield of crops has been discussed in Zone II.

4.26 Sheep constitute 30 to 35 per cent of total livestock and the other livestock are goats and buffaloes (female and young stock). The livestock pattern is S_3 G_4 BF_4 By_4.

Rainfall Zone IV—$E_4(C_1D_2E_1)B_2E_2$

4.27 The district, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_1	Kovur	Nellore
Pd_3 Jr_4 Mt_4/Pu_4	Kavali	,,
	Udayagiri	,,

4.28 The area of the zone is 4724 sq km. The population density varies from 238 per sq km in Kovur to 61 in Udayagiri.

4.29 Kovur and Kavali are coastal taluks and their elevation varies from sea-level to less than 200 masl and in Udayagiri, elevation ranges from 180 to 850 masl.

4.30 Area under forests is 30 per cent in Udayagiri and 10 per cent elsewhere. Land not available for cultivation is 15 to 25 per cent in the Zone. The net sown area is 17 per cent in Udayagiri, 29 per cent in Kavali and 48 per cent in Kavur.

4.31 Almost the entire area is irrigated in Kavur, but only 50 per cent in Kavali and 40 per cent in Udayagiri. Soils are coastal alluvium in the coastal taluks and red sandy and mixed red and black soils elsewhere.

4.32 The annual rainfall of the zone is 90 to 110 cm in about 45 rainy days. October and November are the months of maximum rainfall and together account for more than 45 per cent of the annual rainfall. Paddy occupies 90 per cent of cropped area in Kavur, but only 50 per cent area in Kavali and 12 per cent area in Udayagiri. Relative yields of Nellore district have been discussed under zone-1.

4.33 In Udayagiri sheep constitute 50 per cent of the total livestock of the taluk followed by goats and female buffaloes. Sheep account for 30 per cent of livestock in Kavali and the others are goats, female buffaloes, male and female cattle and youngstock of buffaloes each being 10 to 15 per cent of total.

The livestock pattern are as follows :

Udayagiri	S_3 G_4 Bf_4
Kavali	S_3 G_4 Cf_4 Cm_4 Bf_4
Kovur	Cm_4 Cf_4 Cy_4 Bf_4 By_4

Rainfall Zone V— $E_4(C_1D_3)D_1E_3$

4.34 The districts, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Gn_3 Jk_4 Mt_4/Pd_4	Gooty	Anantapur
	Tadpatri	,,
	Dhone	Kurnool
Gn_4 Mt_4 Jk_4/Jr_4	Pattikonda	,,

4.35 The area of the zone is 7014 sq km. The population density is 90-95 per sq km in Pattikonda and Dhone, 156 in Gooty and 110 in Tadpatri.

4.36 Elevation varies between 300 to 600 masl.

4.37 Area under forests is 20 per cent in Dhone and 10 per cent in Pattikonda and Tadpatri. Land not available for cultivation ranges between 10 and 20 per cent and fallow lands are 10 per cent. The net sown area is 70 per cent in Pattikonda and 50–60 per cent elsewhere.

4.38 Tadpatri has 16 per cent of area under irrigation and it is negligible elsewhere. Soils are mixed red and black with patches of deep black.

4.39 The annual rainfall of the zone is 55–60 cm in 35–40 rainy days. September is the month of maximum rainfall and the total of August and September accounts for 40 per cent of the annual rainfall. There are no consecutive months in this zone with more than 10 cm pm rainfall.

4.40 Groundnut and small-millets are the principal crops in this zone each occupying about 25 to 30 per cent of cropped area. Jowar occupies an area of 25 per cent in Tadpatri and 10 to 15 per cent in the rest of the zone.

4.41 Area and Relative Yield Index of Crops are indicated in Table 12. The yield of groundnut is about 80 per cent and that of jowar about 75 per cent of all-India level. The yield of small millets is only 53 per cent in Kurnool and 41 per cent in Anantapur.

4.42 Sheep constitute a third of total livestock and goats and male cattle are each 15 to 20 per cent. The livestock pattern is S_3 G_4 Cm_4 Cf_4 Bf_4.

TABLE 12

Area and Relative Yield Index values of Crops in Zone V

District	Crop	Area ('000 ha)	RYI*
Anantapur	groundnut	233	82
Kurnool	,,	219	83

Rainfall Zone VI $E_4(C_1D_3)D_2E_2$

4.43 The district, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Gn_3 Jk_4 Mt_4	Pullivendla	Cuddapah
Jk_3 Gn_4 Mt_4 Pd_5	Jammalamadugu	,,

4.44 The total area of the zone is 3062 sq km. The total population of the zone is about 3 lakhs with an average population density of 100 per sq km.

4.45 The elevation in Jammalamudagu varies between 170 to 300 masl and in Pullivendla 300-450 masl.

4.46 Forests form 10 per cent area of the zone and land not available for cultivation and cultivable waste together account for about 30 per cent of the total geographical area. The net sown area is 40 to 50 per cent.

4.47 Area under irrigation is only 10 per cent of cropped area. Soils are deep black or mixed red and black.

4.48 The annual rainfall in the zone is 55-60 cm in 40 rainy days. September is the month of maximum rainfall, the rainfall being 50 per cent higher than that of August or October. There is only one month getting about 10 cm rainfall.

4.49 Groundnut, Jowar (kharif) and small millets are the main crops in this zone. The areas and yields of crops are given in Table 13.

4.50 The yield of groundnut in Cuddapah district is practically the same as all-India but slightly less than

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

the State average. Yield of jowar (Kharif) is 92 per cent of all-India whereas yield of small millets, is only half of all-India level.

4.51 Sheep constitute about 30 per cent of the total livestock, followed by goats (20 per cent) and female buffaloes (16-17 per cent).

The livestock pattern is :

S_3 G_4 Bf_4

TABLE 13

Relative Yield Index values of crops in Zone VI

Crop	Area ('000 ha)	RYI*
groundnut	136	98
jowar (Kharif)	85	92
small millets	46	50

Rainfall Zone VII—E_4 (C_1 D_3) C_2 E_2

4.52 The district, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_3 B_4 Fr_4 R_4	Rajampet	Cuddapah
Gn_2 Pd_4	Rayachoti	,,

4.53 The area of the zone is 5545 sq km. The population of this Zone is 4.9 lakhs with an average population density of 90 per sq km.

4.54 Rayachoti has an elevation of 300–600 masl whereas the maximum elevation goes upto 1000 masl in Rajampet.

4.55 Area under forest is 84 per cent in Rajampet and 31 per cent in Rayachoti. The net sown area in Rajampet is only 12 per cent and in Rayachoti 28 per cent.

4.56 Irrigated area in Rajampet is 77 per cent of cropped area whereas it is only 20 per cent in Rayachoti. Soils are red-sandy and mixed red and black with some mountainous soils in Rayachoti.

4.57 The annual rainfall of this zone is between 67 to 77 cm in 45 rainy days. The month of maximum rainfall is October in Rajampet and September in Rayachoti. September and October fall together account for 35 per cent of annual rainfall. September to November months get 10–20 cm pm.

4.58 Groundnut occupies 60 per cent of cropped area in Rayachoti followed by paddy (14 per cent) and bajra (13 per cent). In Rajampet paddy occupies 40 per cent of cropped area followed by 17 per cent under bajra.

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

4.59 The Relative Yield Index of paddy in Cuddapah district is 122 for winter and 86 for summer. The yield of groundnut is the same as all-India level.

4.60 In Rayachoti sheep constitute a third of the total livestock with male and female cattle and goats accounting for another 48 per cent. The livestock patterns are :

Rajampet S_4 G_4 Cf_4 Cm_4/Bf_4

Rayachoti S_3 G_4 Cf_4 Cm_4

Rainfall Zone VIII—E_4 (C_1 D_3) A_1 B_1 C_1 E_1

4.61 The districts, taluks and the cropping patterns included in the zone are :

Cropping patterns	*Taluk*	*District*
Pd_1	Sullurpet	Nellore
Pd_2 Gn_4	Sri Kalahasti	Chittoor
	Satyavedu	,,

4.62 The area of the zone is 4006 sq km with the areas of taluks varying between 1000 and 1600 sq km. The population is about 4.9 lakhs with an average population density of over 120 per sq km. The population density ranges between 90 and 150 in the taluks.

4.63 Sullurpet is a coastal taluk at sea-level. Elsewhere the heights range between 150 to 900 masl.

4.64 Area under forests is 35 to 40 per cent in Satyavedu and Kalahasti and 35 to 40 per cent of area is not available for cultivation in Sullurpet and Kalahasti. The net sown area covers about 20 per cent in Sullurpet and 25 to 30 per cent elsewhere.

4.65 Area under irrigation is considerable being 75 to 85 per cent of cropped area. Soils are Coastal alluvium in Sullurpet and mainly red sandy elsewhere.

4.66 The annual rainfall is 115 cm in about 50 rainy days. November with more than 30 cm is the month of maxumim rainfall and with October accounts for 50 per cent of annual rainfall. This is a zone of relatively higher rainfall with more than 10 cm pm in the four consecutive months from September to December.

4.67 Paddy is the dominant crop of the zone occupying 70 per cent of cropped area in Sullurpet and 50 to 60 per cent elsewhere. Groundnut, bajra and ragi are the other crops grown in the zone.

4.68 The Yield of paddy in Nellore district in spite of its being entirely irrigated is low, but the RYI is 140 in Chittoor district. The yield of groundnut in Chittoor is 152 per cent of all-India.

4.69 Sheep constitute 20 to 25 per cent of livestock, followed by male cattle (20 per cent), female cattle (15–20 per cent) and goats (10 to 15 per cent). The livestock pattern is :

S_4 Cm_4 Cf_4 G_4

Rainfall Zone IX —E_4 (C_2 D_2) D_2 E_2

4.70 The district, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_3 Gn_4 Jk_4 Mt_5	Cuddapah	Cuddapah
Gn_3 Pd_4 Jk_4	Proddatur	,,
Gn_3 Jk_4 Mt_4	Kamalapuram	,,

4.71 The total area of the zone is about 3200 sq km. The areas of individual taluks vary between 800 and 1300 sq km. The total population of this zone is 5.4 lakh with an average population density of 170 per sq km the density ranges between 128 and 200 per sq km.

4.72 Kamalapuram and Cuddapah have elevations ranging between 150 and 200 masl whereas in Proddatur, the maximum elevation rises up to 700 masl.

4.73 Forests account for 40 per cent of area in Cuddapah and 20 per cent in Proddatur. Land not available for cultivation is 15 per cent and cultivable waste is 11 per cent. Net area sown is only 37 per cent in Cuddapah and varies from 50 to 60 per cent in the rest of the zone.

4.74 Area under irrigation is 60 per cent in Cuddapah, 36 per cent in Proddatur, and 10 per cent in Kamalapuram. Soils are mainly red sandy.

4.75 Rainfall varies from 60 to 75 cm in 40 to 45 rainy days. September is the month of maximum rainfall, and together with August accounts for 40 per cent of annual rainfall.

4.76 Groundnut, paddy and jowar (Kharif) are the main crops grown in this zone.

4.77 The Relative Yield Index values of crops are given in Table 14. The yield of Rice is 123 per cent of all-India level and of groundnut just all-India level.

4.78 Sheep constitute 30 to 40 per cent of the total livestock followed by female buffaloes (17 to 20 per cent), goats (12 per cent) and male cattle (13 per cent). The livestock pattern is :

S_3 Bf_4 G_4 Cm_4

TABLE 14

Relative Yield Index Values for Crops in Zone IX

Crops	RYI*
rice	123
jowar (Kharif).	92
small millets	50
groundnut	98

Rainfall Zone X—E_4 (C_2 D_2) C_2 E_2

4.79 The district, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_3 Mt_4 Pu_4 R_4	Badvel	Cuddapah
Pd_5 B_4 Fr_4 R_4	Sidhout	,,

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

4.80 The area of the zone is 3,536 sq km. The total population of the zone is 2.4 lakh with an average population density of 68 per sq km.

4.81 The elevations range from 140 to 900 masl.

4.82 Nearly half of the area is under forests and 13 to 16 per cent area is not available for cultivation. Net sown area is only 8 per cent in Sidhout and 17 per cent in Badvel.

4.83 Half of Badvel taluk and a third of Sidhout are irrigated. Soils are mainly red sandy.

4.84 The average annual rainfall is 75 cm in 47 rainy days. September is the month of maximum rainfall in Sidhout and October-November in Badvel. The consecutive months August to November get more than 10 cm pm.

4.85 The principal crops of the zone are paddy, ragi bajra and small millets. Other pulses occupy about 10 per cent of cropped area in Badvel. The crop patterns show paddy as predominant crop and only in Sidhout, fruits occupy more than 10 per cent area.

4.86 The yield of paddy which is irrigated is not high. Bajra and ragi yields are above all-India and State averages.

4.87 Sheep constitute 45 per cent of livestock in Badvel and 36 per cent in Sidhout, followed by goats (22-24 per cent) and female buffaloes (11–14 per cent). The livestock pattern is :

S_3 G_4 Bf_4

Rainfall Zone XI —E_4 (C_3 D_1) D_1 E_3

4.88 The districts, taluks and cropping patterns in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_2 B_4	Miryalguda	Nalgonda
Pd_3 Jk_4 O_4 / V_4 F_4	Hyderabad (U)	Hyderabad
	Hyderabad (E)	,,
Pd_4 Jk_4 Jr_4 O_4 Pu_4/B_4	Ramannapet	Nalgonda
	Nalgonda	,,
Pd_4 Jk_4 Gn_4 Mt_4/Jr_4	Nandyal	Kurnool
	Allagadda	,,
Jk_3 Pd_4 O_4 Pu_4/B_4	Bhongir	Nalgonda
	Jangaon	Warangal
Jk_3 Mt_4 Gn_4/C_4 Pd_5/Jr_4	Koilkuntla	Kurnool
	Banganpalle	,,
Jk_3 Gn_4 O_4	Achampet	Mahboobnagar
Jk_4 Gn_4 B_4 Pu_4	Gadwal	,,
Jk_3 Gn_4 Mt_4 Pd_4/R_4	Nagarkurnool	Mahboobnagar
Jk_3 Gn_4 Pd_4 Mt_4	Mahboobnagar	Mahboobnagar
	Wanaparthi	Mahboobnagar
	Atmakur	,,
Jk_4 Pu_4 R_4 O_4 Pd_4	Shadnagar	Mahboobnagar
Jk_4 Pd_4 Jr_4 O_4 R_4/Pu_4	Hyderabad (W)	Hyderabad
Jk_4 Jr_4 O_4 V_4	Chevella	Hyderabad

Cropping pattern	*Tuluk*	*District*
Jr_3 Gn_4 Pd_4/Mt_4	Kurnool	Kurnool
	Nandikotkur	,,
	Atmakur	,,
Jr_3 Mt_4 Gn_4 Jk_4	Makhtal	Mahboobnagar
Jr_3 Pd_4 Gn_4 Pu_4	Huzurnagar	Nalgonda
	Suryapet	,,
Jr_4 Pu_4 O_4 T_4	Tandur	Hyderabad
Gn_4 Mt_4 Jk_4 Jr_4/Pu_4	Kollapur	Mahboobnagar
	Alampur	,,
O_3 Jk_4 B_4	Kalvakurti	Mahboobnagar
	Ibrahimpatnam	Hyderabad
	Devarkonda	Nalgonda
C_3 Mt_4 Jr_4/Gn_4 Jk_4	Alur	Kurnool
	Adoni	
Jr_4 Pu_4 Jk_4 Mt_4 G_4	Kodangal	Mahboobnagar
M_3 Pd_4 Jk_4	Medchal	Hyderabad
Mt_3 B_4 Pd_4 Jk_4/Gn_4	Giddalur	Ongole

4.89 This is the biggest of the 28 zones, comprising 37 taluks in six districts. The area of the zone is 56,821 sq km accounting for more than 20 per cent of the area of the State. The areas of taluks vary widely from less than 1,000 sq km to 3,000 sq km. The zone has a total population of 82 lakhs with an average population density of 144 per sq km.

4.90 The zone is a plateau with minimum and maximum elevations ranging mostly between 200 and 700 masl. A few taluks have maximum elevation ranging between 700 and 950 masl.

4.91 Atmakur and Achampet taluks have 65–75 per cent area under forests. In a few others forests occupy 30 to 50 per cent of their respective geographical areas. In other taluks forest area is 10 to 20 per cent or less. Land not available for cultivation is generally 10 to 20 per cent. Net sown area is generally more than 40 per cent excepting in Hyderabad and a few other taluks. The highest is 86 per cent in Alur taluk.

4.92 About twelve taluks have more than 20 per cent cropped area under irrigation. On the whole, this is a zone with very little irrigation. Soils are mainly red sandy though in some taluks mixed red and black soils are present.

4.93 The annual rainfall in this zone varies between 60 to 80 cm. September is the month of maximum rainfall though in a few taluks in Hyderabad and Mahboobnagar July has maximum rainfall. August and September in general account for about 50 per cent of annual rainfall. The months of July to September get 10–20 cm pm rainfall.

4.94 The zone covers most of the taluks of four districts and the main crops of these districts are jowar, paddy, pulses and groundnut. The percentage areas accounted for by these crops in the four districts are as follows :—

District	*Jowar*	*Paddy*	*Pulses*	*Groundnut*
Hyderabad	31	11	5	—
Nalgonda	25	22	9	10
Kurnool	27	—	9	19
Mahboobnagar	32	10	9	1

4.95 The Relative Yield Index values of crops grown in the four districts of this zone are given in Table 15. The yield of rice ranges between 97 to 121 per cent of all-India level. Yields of jowar (both kharif and rabi) are low. The yields of bajra, small millets, cotton and pulses are very low, being around 50 per cent of all-India level.

4.96 Sheep predominate in a large part of the zone (31 taluks) followed by male cattle, The zone has seven livestock patterns of which four begin with sheep(s) and two with female buffaloes.

The livestock patterns of the zone are :

(i) S_3 Cm_4 Cf_4/G_4 Bf_4
(ii) S_4 Cm_4 Cf_4 Cy_4/G_4
(iii) S_4 G_4 Cm_4 Cf_4 Bf_4/By_4
(iv) S_4 G_4 Bf_4 By_4
(v) Cm_4 Cf_4 Cy_4 S_4 G_4
(vi) Bf_3 By_4 G_4 Cm_4
(vii) Bf_4 S_4 Cm_4 Cf_4

Special as they cover only one taluk each *viz* (1) Hyedrabad urban and (2) Atmakur.

TABLE 15

Relative Yield Index Values of Crops in District of Zone XI

Crop	District			
	Hydera-bad	Nal-gonda	Mahboob-nagar	Kur-nool
rice	110	100	97	121
jowar (kharif)	87	67	96	60
jowar (rabi)	102	55	73	86
bajra	62	62	66	89
small millets	45	47	36	53
total pulses	41	28	42	51
groundnut	88	88	81	83
cotton	42	56	27	37

Rainfall Zone XII—E_4 (C_3 D_1) C_1 D_1 E_2

4.97 The district, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_4 Ch_4 Jr_4 Pu_4 Gn_4 Mt_4	Sattenapalli	Guntur
Pd_4 To_4 Jr_4 Fr_4/Mt_4	Narasaraopet	,,
Mt_4 B_4 Pd_4 Jk_4 Ch_4/Jr_4	Palnad	,,

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

4.98 The area of the zone is 5,686 sq km and the areas of all taluks are above 1,000 sq km. The population in the zone is more than 9 lakhs with average population density of about 160 per sq km.

4.99 The heights range between 150 to 500 masl.

4.100 Forests occupy 20—30 per cent of geographical area in Sattenapalli and Palnad and negligible elsewhere. Land not available for cultivation is about 20 per cent in Palnad and Narsaraopet and 10 per cent in Sattenapalli. The net sown area is 55 per cent of geographical area in Sattenapalli and Narsaraopet and 41 per cent in Palnad.

4.101 About 25 per cent of cropped area in Palnad and 45 per cent in the rest of the Zone are under irrigation. Soils are red sandy and deep black.

4.102 The annual rainfall varies between 70 and 80 cm in 50 rainy days. July is the month of maximum rainfall in Sattenapalli and month of September elsewhere. The months July to October receive more than 10 cm pm rainfall.

4.103 Paddy, jowar, groundnut and small millets are the main crops grown in the zone, though bajra and chillies in Palnad and tobacco in Narsaraopet have significant areas. Yields of tobacco and small millets are 83 per cent of all-India level, whereas yields of others are above all-India. The relative Yield Index values of the main crops are given in Table 16.

4.104 Sheep constitute 28 per cent of livestock population followed by female buffaloes (20 per cent), young stock of buffaloes (11—15 per cent), goats (10 per cent), male cattle (11 per cent). The livestock pattern is :

S_4 Bf_4 By_4 Cm_4 G_4

TABLE 16

Relative Yield Index Values of Crops in Guntur District

Crop	RYI*
paddy	125
Jowar (kharif)	113
jowar (rabi)	128
small millets	83
bajra	119
tobacco	83

Rainfall Zone XIII— E_4 (C_3 D_1) C_2 E_2

4.105 The districts, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_1	Repalle	Guntur
Pd_2 Pu_4	Bapatla	,,
Pd_4 To_4 Jr_4 F_4/Mt_4	Chirala	Ongole
To_4 Mt_4 Jr_4 F_4/Pd_4 B_4	Addanki	,,

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

4.106 The area of this zone is 3,918 sq km. The total population is 1.1 million with average population density of about 280 per sq km.

4.107 Repalle and Bapatla are at sea level and the elevations in other two taluks rise upto 300 masl.

4.108 Forest area is insignificant and land not available for cultivation is 10—20 per cent. Net sown area is 82 per cent in Bapatla and 55 to 65 per cent elsewhere.

4.109 Irrigation facilities are good in Repalle and Bapatla whereas only 30 per cent of area is irrigated in Chirala and 15 per cent in Addanki. Soils are deep black and red sandy in Addanki but elsewhere deltaic alluvium and red sandy soils prevail.

4.110 The average annual rainfall is 90 to 100 cm in Repalle and Bapatla while chirala and Addanki receive about 80 cm. October is generally the month of maximum rainfall and together with September account for 30 to 40 per cent of annual rainfall. July to November months get 10—20 cm pm.

4.111 Paddy is the predominant crop of the zone occupying 78 per cent of cropped area in Repalle and 45 per cent in Bapatla, Tobacco is the major crop in Addanki Occupying about 30 per cent of cropped area.

4.112 The Relative Yield Index of rice is 125 in Guntur district and 89 in Ongole district. Yield of jowar and tobacco in Ongole is about 75 per cent of all-India level.

4.113 Buffaloes account for 55 to 65 per cent of the total livestock with male cattle and sheep accounting for about 10 per cent each. The livestock pattern is :

Bf_4 By_4 S_4 Cm_4/Bm_4

Rainfall Zone XIV— $E_4(C_4)$ C_1 D_1 E_2

4.114 The districts, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_1	Gudivada	Krishna
	Kaikalur	,,
	Gannavaram	,,
Pd_3 Pu_4 Gn_4 Jr_4/Fr_4	Vijayawada	,,
Jr_3 Pu_4 Pd_4/Gn_4	Jaggayyapet	,,
	Nandigama	,,
Pd_2 Pu_4	Tenali	Guntur
Pd_4 Ch_4 Jr_4 Pu_4 To_4	Guntur	,,

4.115 The area of the zone is 7,634 sq km and the areas of the taluks range from 600 to 1,400 sq km. The total population of the zone is about 3.4 million with a high average population density of 448 per sq km.

4.116 Taluks of Krishna district are practically at sea level except for these in the interior like Vijayawada and Nandigama where the maximum elevation is between 300 to 400 masl.

4.117 Vijayawada and Jaggayyapet have 15 per cent of geographical area under forests and elsewhere it is negligible. 10 to 15 per cent land is not available for

cultivation. The net sown area varies widely from 55 to 60 per cent in Kaikalur, Vijayawada and Jaggayyapet, 68 per cent in Gannavaram and Nandigama and more than 80 per cent elsewhere.

4.118 Kaikalur taluk is fully irrigated followed by Gudivada and Gannavaram (70 to 80 per cent), Tenali (58 per cent) and Nandigama (13 per cent). Jaggayyapet and Nandigama have deep black and red sandy soils and elsewhere the soils are mainly mixed red and black with small areas of deltaic alluvium.

4.119 The annual rainfall is 80 cm in Jaggayyapet and Nandigama, and 90 cm in Guntur. In the rest of the zone the annual rainfall is about 95 cm in 53 rainy days. July is the month of maximum rainfall and together with August accounts for 35 to 40 per cent of annual rainfall. All the five consecutive months June to October get more than 10 cm pm.

4.120 Paddy is the most important crop of the zone occupying almost the entire cropped area in Kaikalur, but elsewhere it ranges from 13 per cent in Nandigama to 78 per cent in Gudivada. Only in Guntur taluk, tobacco and chillies are cultivated on significant areas.

4.121 Area and Relative Yield Index Values of Crops are given in Table 17. Yield of rice in summer is low but the overall yield is above all-India level. Yield of jowar is good.

4.122 Female buffaloes constitute 20—35 per cent of livestock population in the zone. The livestock patterns are :

$Bf_4\ By_4\ Cm_4\ Cf_4/S_4/Bm_4$

$Bf_4\ By_4\ Cm_4\ Cf_4\ S_4$

TABLE 17

Area and Relative Yield Index Values of Crops in Zone XIV

Crop		Area ('000 ha)	RYI*
rice	autumn	230	131
	winter	57·8	125
	summer	83·9	66
	total	372	128

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

Rainfall Zone XV—E_4 (C_4) B_1 C_1 E_2

4.123 The districts, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_1	Kakinada	E. Godavari
	Ramachandrapuram	,,
	Mummidivaram	,,
	Razole	,,
	Amlapuram	,,
	Narsapur	W. Godavari
	Bandar	Krishna
	Divi	,,
	Alamuru	,,
$Pd_2\ O_4\ Fr_4$	Kothapeta	E. Godavari

4.124 The total area of the zone is 6,301 sq km with the areas of individual taluks varying from 280 to 1,200 sq km. The total population of the zone is about 27 lakhs with average population density of 435 per sq km. The population density in this zone is high, ranging from 233 in Divi to 670 in Kothapeta.

4.125 The entire zone is at sea level.

4.126 Area under forests is 25 per cent in Kakinada and elsewhere it is negligible. Land not available for cultivation is about 16 per cent and fallow lands are negligible. The net sown area generally exceeds 50 per cent of cropped area.

4.127 The zone has good irrigation facilities, the percentage area irrigated ranging from 70 to 90. The soils are deltaic alluvium.

4.128 The average annual rainfall of this zone exceeds 100 cm, the highest being in Mummidivaram (130 cm). October is the month of maximum rainfall and together with September accounts for about 35 per cent of the annual rainfall. There are six consecutive months from June to November which receive more than 10 cm of rainfall per month.

4.129 The main crop of this zone is paddy which occupies more than 70 per cent of cropped area excepting in Kothapeta where it accounts for about 50 per cent.

4.130 Area and Relative Yield Index Values of rice for the districts of East Godavari, West Godavari and Krishna are given in Table 18, the yields are generally above all-India and high in West Godavari district.

4.131 Female buffaloes and male cattle together account for about 40—50 per cent of total livestock. The livestock pattern is :

$Bf_4\ Cm_4\ Cf_4\ Cy_4\ By_4$.

TABLE 18

Area and Relative Yield Index Values of Rice in Zone XV

District	Autumn	Winter	Summer	Total
East Godavari :				
area (thousand ha)	188	44	84	316
*RYI	122	110	99	119
West Godavari :				
area (thousand ha)	228	31	104	363
*RYI	157	150	121	157
Krishna :				
area (thousand ha)	230	58	84	372
*RYI	131	125	66	128

* 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 XVI—E_4 (B_1 C_3) D_1 E_3

4.132 The districts, taluks and the cropping patterns in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_3 M_4 S_4/Jr_4	Narsapur	Medak
	Medak	,,
Pd_4 Pu_4 M_4 Jr_4/Jk_4	Narsampet	Warangal
	Warangal	,,
	Huzurabad	Karimnagar
	Karimnagar	,,
	Sirsilla	,,
Jk_4 Pd_4 Jr_4 O_4 R_4/Pu_4	Vicarabad	Hyderabad
Jk_4 Pu_4 R_4 Pd_4 O_4/Mt_4	Pargi	Hyderabad
Jr_3 Pu_4 $Pd_4/Jk_4/Gn_4$	Khammam	Khammam
Jr_3 Pu_4 Pd_4	Mahbubabad	Warangal
	Manthani	Karimnagar
	Lakshettipet	Adilabad
Jr_3 Pu_4 O_4	Asifabad	Adilibad
Jr_4 Pu_4 Jk_4 Pd_4/T_4	Zahirabad	Medak
	Narayankhed	,,
Jr_4 Pd_4 Pu_4 M_4	Sultanabad	Karimnagar
Jr_4 Jk_4 Pu_4 O_4/Pd_4	Sangareddy	Medak
	Andole	,,
M_3 Pd_4 Pu_4	Kamareddy	Nizamabad
M_4 Pd_4 Jk_4 O_4/R_4	Gajwel	Medak
	Siddipet	,,
Pu_4 M_4 Jk_4 Pd_4	Jagtial	Karimnagar

4.133 The total area of this zone is 35,558 sq km covering 23 taluks. The areas of all taluks excepting Narayankhed (960 sq km) exceed 1000 sq km.

4.134 The zone is mostly plateau, elevations ranging between 200 and 700 masl. In 13 taluks the maximum elevation is between 600 to 700 masl. The total population is 56 lakhs with an average population density of 157 per sq km, the taluk density ranging from 55 to 310.

4.135 Areas under forests account for quite a significant proportion of geographical area, the percentages ranging from 28 to 65. Land not available for cultivation is 10 to 15 per cent and the net sown area ranges from 40 to 60 per cent except in some taluks which have only 20 to 30 per cent area.

4.136 Area under irrigation is 30 to 40 per cent of cropped area in Narsapur, Huzurabad, Karimnagar, Warangal, Vicarabad and Narasampet and ranges from 20 to 25 per cent in Manthani, Lakshettipet, Mahbubabad, Kamareddy, Gajwel, Siddipet, Khammam and Jagtial. Soils are mainly red sandy with medium black in a few taluks and laterite soils are reported in Andole and Zahirabad.

4.137 The annual rainfall of the zone ranges from 80 to 100 cm. July is the month of maximum rainfall with more than 20 cm and the months June to September receive more than 10 cm pm.

4.138 Paddy, jowar, maize and pulses are the main crops grown in the zone. Paddy occupies 25 to 48 per cent of cropped area in six taluks. Jowar is a major crop in twelve taluks the percentage areas ranging from 17 to 51. Maize is major crop in two taluks occupying about 30 per cent of cropped area. In all, there are 14 cropping patterns, 3 begining with paddy, 8 with jowar, two with maize and one with pulses.

4.139 The Relative Yield Index values of crops in the three districts in the zone are given in Table 19. The rice yields are just above all-India level but slightly lower than the State average. Yield of jowar is good and higher than State as well as all-India level. Yield of pulses is very low.

4.140 Sheep and male cattle are the main types of livestock. There are eleven taluks which have sheep accounting for more than 30 per cent of total livestock. The livestock patterns are indicated below :

(*i*) S_3 Cm_4 Cf_4 Cy_4	Narasampet
	Warrangal
	Huzurabad
	Karimnagar
	Sirsilla
	Sultanabad
	Sangareddy
	Kamareddy
	Gajwal
	Siddipet
	Jagtial
(*ii*) S_4 Cm_4 Cf_4 Cy_4/G_4	Narsapur
	Medak
	Pargi
	Khammam
	Mahbubnagar
(*iii*) Cm_4 Cf_4 Cy_4 S_4 G_4	Manthani
	Lakshettipet
	Asifabad
	Zahirabad
	Narayankhed
	Vicarabad
(*iv*) G_3 Cm_4 Cf_4 Cy_4	Andole

TABLE 19

Reltive Yield Index Values of Crops in Zone XVI

District	Rice	Jawar (Kharif)	Jawar (Rabi)	Total Pulses	Maize
Medak	98	111	108	47	76
Karimnagar	114	96	63	16	119
Warangal	112	121	105	29	98

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 XVII—E_4 (B_1 C_3)C_1 D_1 E_2

4.141 The districts, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_1	Eluru	W. Godavari
	Tadepalligudem	,,
	Bheemavaram	,,
Pd_2 S_4	Tanuku	W. Godavari
Pd_3 Pu_4 Gn_4 F_4	Nuzvid	Krishna
Pd_3 Pu_4 Fr_4 $S_4/O_4/To_5$	Polavaram	W. Godavari
	Chintalapudi	,,
	Kovvur	,,

4.142 The total area of the zone is about 8,000 sq km and the areas of taluks vary from 555 sq km to 1,421 sq km. The population density varies very videly from 96 per sq km in Polavaram taluk to 674 in tanuku.

4.143 The area is mainly at sea-level except in a few taluks where the elevation goes up to 200 masl and in Polavaram to 400 masl.

4.144 Area under forests is 43 per cent of geographical area in Polavaram, 13 per cent in Nuzvid and Chintalapudi and negligible elsewhere. Land not available for cultivation ranges from 15 to 25 per cent and fallow lands are 5 per cent. Net sown area is 25 per cent in Polavaram, 45 per cent in Chintalpudi, 80 per cent in Tanuku and 55 to 65 per cent in the rest of the zone.

4.145 Soils are mainly red sandy with deltaic alluvium in a few taluks. Bheemavaram taluk is completely irrigated. Eluru and Tadepalligudem have 80 per cent of cropped area under irrigation and in rest of the zone it is 40 to 50 per cent.

4.146 The annual rainfall of the zone is more than 100 cm in 55 to 60 rainy days. July is the month of maximum rainfall receiving 20 to 30 cm and together with August accounts for more than 35 per cent of annual rainfall. All the months from June to October get more than 10 cm pm.

4.147 Paddy is the main crop occupying more than 75 per cent of cropped area in Eluru, Tadepalligudem and Bheemavaram, 60 per cent in Tanuku and 30 to 40 per cent elsewhere. The other crops cultivated are other pulses, sugarcane and groundnut.

4.148 Area and Relative Yield Index Values of Crops of West Godavari district are given in Table 20. The paddy yields are well above State and all-India levels. The yields of pulses is very low (less than 30 per cent) and that of sugarcane is high being 175 per cent of all-India level.

4.149 Male and female cattle and female buffaloes together account for more than fifty per cent of the total livestock in the zone. The livestock patterns are:

Eluru, Tadepalligudem, Bheemavaram, Tanuku — Bf_4 Cm_4 Cf_4 By_4 S_4/Cy_4

Nuzvid, Polavaram, Chintalpudi, Kovvur — Cm_4 Cf_4 Cy_4 Bf_4 S_4

TABLE 20

Area and Relative Yield Index Values of Crops in Zone XVII

Crops		Area ('000 *ha*)	RYI*
rice	autumn	230	157
	winter	58	150
	summer	24	121
	total	372	157
sugarcane		31	175
total pulses		29	28

Rainfall Zone XVIII—E_4(B_2C_2)D_1E_3

4.150 The districts, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_3 M_4 Pu_4/Jr_4	Armur	Nizamabad
Jr_3 Pu_4 Pd_4	Tiruvur	Krishna
Jr_3 Pu_4 $Pd_4/Jk_4/Gn_4$	Yellandu	Khammam
	Bhoorgampadu	,,
	Bhadrachalam	,,
	Kothagudam	,,
	Madhira	,,
Pu_4 M_4 Jk_4 Pd_4	Metepalle	Karimnagar

4.151 The total area of the zone is about 16,500 sq km. The zone has a total population of about 16 lakh and an average population density of 100 per sq km.

4.152 The elevation ranges between 80 and 700 masl.

4.153 The main soil types are deep black and red sandy and red loamy soils are present in the heavily forested taluks of Bhoorgampadu and Bhadrachalam, about 50 per cent of cropped area in Armur is irrigated and 15—25 per cent in the remaining taluks.

4.154 The annual average rainfall is about 100 cm in 50 to 60 rainy days. July is the month of maximum rainfall and together with August accounts for 50 per cent of annual rainfall. The months June to September receive more than 10 cm pm; both July and August get 20—30 cm pm.

4.155 Area under forests ranges from about 11 per cent in Madhira to about 80 per cent of geographical area in Bhadrachalam and Bhoorgampadu. Land not available for cultivation and fallow lands are between 10 to 20 per cent. Net sown area ranges from 12 to 16 per cent in two taluks to about 55 per cent in three taluks.

4.156 Paddy, other pulses and jowar are the main crops cultivated in this zone. Jowar (rabi) occupies nearly 30 to 44 per cent of cropped area in many taluks, followed by paddy ranging from 17 to 43 per cent.

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

4.157 Area and Relative Yield Index values of crops in Khammam district are given in Table 21. The yield of jowar (rabi) is higher than all-India as well as State average. Rice yields are close to the State but higher than all-India level.

4.158 In Armur and Metepalle taluks sheep and male cattle constitute 50 to 60 per cent of total livestock whereas in Tiruvur and Madhira female buffaloes, sheep and cattle account for 70 per cent of the entire livestock. The livestock patterns are :

Armur, Metpalle	$S_3\ Cm_4\ Cf_4\ Cy_4$
Yellandu, Bhoorgampadu, Bhadrachalam, Kothagudem	$Cf_4\ Cm_4\ Cy_4\ S_4/G_4$
Madhira, Tiruvur	$Bf_4\ S_4\ Cf_4\ Cm_4\ Cy_4$

TABLE 21

Area and Relative Yield Index Values of Crops in Zone XVIII

Crop		Area ('000 ha)	RYI*
Jowar	rabi	197	113
rice	autumn	56	125
	winter	29	119
	summer	1·5	76
	total	86	119
total pulses		73	36

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

Rainfall Zone XIX— $E_4\ (B_3\ C_1)\ D_1\ E_3$

4.159 The districts, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
$Pd_2\ M_4$	Nizamabad	Nizamabad
$Pd_3\ Jr_4\ Jk_4/S_4/Pu_4$	Banswada	Nizamabad
	Yellareddy	,,
	Bodhan	,,
$Jr_4\ Pu_4\ Jk_4\ Gn_4$	Madnur	Nizamabad

4.160 The total area of the zone is 4936 sq km and the total population is 8.1 lakh with an average population density of 165 per sq km.

4.161 The zone is an elevated plateau with heights ranging between 300 to 670 masl.

4.162 Area under forests is 40 per cent of geographical area in Yellareddy taluk and ranges from almost negligible to 25 per cent in other taluks. Land not available for cultivation accounts for about 15 per cent and fallow lands 15 to 25 per cent. Net sown area varies widely ranging from 30 to 80 per cent.

4.163 In Bodhan taluk, about 65 per cent of cropped area is under irrigation, and elsewhere it ranges from 40 to 50 per cent except in Madnur where irrigation facility is non-existent. Soils are mainly medium black with some parts having red sandy or deep black soils.

4.164 Annual rainfall is generally above 100 cm in about 55—60 rainy days, the principal rainy season being June to September accounting for 90 per cent or more of total rainfall. All the four months June to September get more than 10 cm pm and in particular July to September receive 20—30 cm pm.

4.165 Paddy is the main crop occupying 40 to 55 per cent of cropped area except in Madnur, where it is negligible. Maize, jowar, other pulses and sugarcane are the other crops grown in this zone.

4.166 The area and yield of crops in Nizamabad district are given in Table 22. The yield of paddy is the highest in the State and jowar (rabi) yield is the same as all-India. Yield of maize is good.

4.167 Male, female and youngstock cattle account for nearly 50 to 70 per cent of livestock population. The livestock pattern is :

$Cm_4\ Cf_4\ Cy_4\ S_4\ G_4$

TABLE 22

Area and Relative Yield Index Values of Crops in Zone XIX

Crop	Area ('000 ha)	RYI*
rice	117	158
jowar (rabi)	41	102
jowar (kharif)	24	80
maize	39	170
gram	12	40
total pulses	51	39

Rainfall Zone XX— $E_4\ (A_1\ B_1\ C_2)\ D_1\ E_3$

4.168 The districts, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
$Pd_2\ Jr_4$	Mulug	Warangal
$Pd_3\ M_4\ Pu_4$	Khanapur	Adilabad
$Pd_4\ Pu_4\ M_4/Jk_4$	Parkal	Warangal
$Jk_3\ C_4\ O_4/Pu_4$	Adilabad	Adilabad
	Boath	,,
	Utnur	,,
$Jk_4\ C_4\ Pu_4\ Pd_4/O_5$	Mudhol	Adilabad
	Nirmal	,,

4.169 The area of the zone is 12,705 sy km with most of the taluk areas exceeding 1000 sq km. This is a zone of low population density with four taluks having a population density of less han 100 per sq km.

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

4.170 The heights range between 150 and 600 masl.

4.171 The zone has significant area under forests, the percentage of geographical area accounted for by forests ranging from 25 to 60 per cent in most of the taluks. Land not available for cultivation is about 10 per cent with fallow lands being negligible in many taluks. Net sown area ranges from as low as 13 per cent in Mulug taluk to 73 per cent in Mudhol.

4.172 Parkal, Khanapur and Mulug taluks are having 35 to 50 per cent of cropped area under irrigation and in some taluks there is negligible area under irrigation. Soils are mainly mixed red and black or deep black.

4.173 The annual average rainfall exceeds 100 cm in about 60 rainy days. July is the month of maximum rainfall with more than 30 cm and together with August accounts for more than 50 per cent of annual rainfall. All the months June to September receive more than 10 cm. pm.

4.174 In taluks of Adilabad where irrigation is negligible jowar (kharif)and cotton are the main crops. Elsewhere paddy other pulses maize and jowar are the main crops.

4.175 The area and Relative Yield Index values of crops are given in Table 23. Yield of rice is low, that of Jowar (rabi) and Jowar (kharif) is satisfactory. The yields of maize, tur, total pulses and cotton are much below all-India level.

4.176 Male, female and younstock of cattle account for more than 60 per cent of livestock and together with sheep or goats the total exceeds 70 per cent. The livestock patterns are :

$Cm_4Cf_4Cy_4S_4$ $Cm_3Cf_4Cy_4$ $S_3Cm_4Cf_4$

TABLE 23

Area and Relative Yield Index Values of Crops in Zone XX

Crop	Area ('000 ha)	RYI*
rice	53·7	90
jowar (kharif)	108	112
(rabi)	109	94
maize	18	33
tur	27	63
total pulses	113	46
cotton	83	51

Rainfall Zone XXI— E_4 (A_2 B_1 C_1) D_1 E_3

4.177 The district, taluks and the cropping patterns included in the zone are :

Cropping patterns	*Taluks*	*District*
Jr_3 Pu_4 O_4/Pd_4	Sirpur	Adilabad
	Chinnur	,,

4.178 The area of the zone is 4000 sq km. The population of the zone is about 2.9 lakhs with average population density of 71 per sq. km.

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

4.179 The heights range between 150 to 450 masl.

4.180 Forests occupy nearly 50 per cent of the geographical area, followed by land not available for cultivation accounting for about 15 per cent. Net area sown is 33 per cent in Sirpur and 22 per cent in Chinnur taluks.

4.181 Irrigation is negligible in the zone and soils are mainly red loamy.

4.182 The annual rainfall varies between 110 to 125 cm and the month of maximum rainfall is July or August—and these together account for 60 per cent of the annual rainfall. July and August get more than 30 cm pm and September 20—30 cm.

4.183 The predominant crop in the zone is jowar (rabi) which occupies 50 per cent of the cropped area in Sirpur and 40 per cent in Chinnur. Pulses other than tur and gram are cultivated on 20 per cent of the total cropped area.

4.184 Area and Relative Yield Index values of crops are given in Table 24. The Relative yield Index of paddy in the district is on the low side being only 90 per cent of all-India and that of jowar is the same as State average though slightly less than all-India. The yields of pulses and sesamum are low.

4.185 Male cattle constitute 30 per cent of livestock, followed by female cattle 23 per cent and youngstock 18 per cent. The livestock pattern is :

Cm_4 Cf_4 Cy_4

TABLE 24

Area and Relative Yield Index Values of Crops in Zone XXI

Crop	Area ('000 ha)	RYI*
rice	54	90
jowar (rabi)	109	94
total pulses	113	46
sesamum	38	71
castor seed	5·3	201

Rainfall Zone XXII—D_1 E_3 (C_1 D_1 E_2) D_1 E_3

4.186 The district, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Jk_4 Mt_4 Gn_4 Pu_4/C_4 Jr_4	Kalyandurg	Anantapur
	Rayadurg	,,
Gn_4 Mt_4 C_4 Jr_4	Uravakonda	,,

4.187 The area of the zone is 4962 sq km and the total population is 4.4 lakhs with average population density of 88 per sq km.

4.188 The zone is a plateau ranging from 450 to 1000 masl.

4.189 Forest area is negligible and area under fallow lands is 15 to 30 per cent of geographical area. Net sown area is 76 per cent in Uravakonda, 60 per cent in Rayadurg and 46 per cent in Kalyandurg.

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

4.190 Area under irrigation is 15 per cent in Rayadurg and negligible elsewhere. Soils are mixed red and black and red sandy.

4.191 The annual rainfall of the zone is about 50 cm in 33 rainy days. September is the month of maximum rainfall and together with October, accounts for 40 per cent of annual rainfall. September is the only month during the year with more than 10 cm rainfall.

4.192 Jowar (kharif and rabi), groundnut, small millets, cotton and bajra are the main crops of the zone; small quantities of paddy and other pulses are also grown.

4.193 Area and Relative Yield Index values of crops are given in Table 25. Excepting rice, the yields of all crops are much below all-India level, jowar being 66, small millets 41 and cotton 34 per cent of all-India.

4.194 Sheep, goats, male and female cattle together account for more than 70 per cent of the total livestock. The livestock pattern is :

S_3 G_4 Cm_4 Cf_4

TABLE 25

Area and Relative Yield Index Values of Crops in Zone XXII

Crop	Area ('000 ha)	RYI*
Jowar (kharif)	116	62
jowar (rabi)	32·7	74
total	148·7	66
small millets	150	41
groundnut	233	82
cotton	32·7	35
bajra	61·5	89
rice	57·8	136

Rainfall Zone XXIII—D_1 E_3 (C_1 D_2 E_1) C_1 D_1 E_2

4.195 The district, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Gn_2 B_4	Kadiri	Anantapur
Gn_3 Pd_4 Pu_4 Mt_4/R_4 B_4	Hindupur	,,
	Penukonda	,,
	Dharmavaram	,,
	Anantapur	,,
Mt_4 Gn_4 Pu_4 R_4 Jk_4	Madakasira	,,

4.196 The area of the zone is 11261 sq km and the total population is 130 lakhs with an average population density exceeding 110 per sq km.

4.197 This is a plateau area, the elevations ranging between 300 and 950 masl.

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

4.198 Forest area accounts for nearly 20 per cent of geographical area in Kadiri and Penukonda and it is negligible elsewhere. Land not available for cultivation is 15 to 20 per cent, cultivable waste about 10 per cent and fallow lands 20 to 25 per cent.

Net sown area is 35 to 45 per cent except in panukonda where it is as low as 19 per cent.

4.199 Soils are red sandy and in some areas red loamy. About 20 to 30 per cent of cropped area is irrigated.

4.200 Annual rainfall is 50 to 60 cm in 35 to 40 rainy days. September is the month of maximum rainfall and together with October accounts for about 40 per cent of annual rainfall; both these months get 10—20 cm pm.

4.201 Groundnut is the principal crop in this zone, occupying 25 to 30 per cent of cropped area except in Kadiri where it is 53 and Madakasira 14 per cent. The other crops grown are small millets, paddy, other pulses and ragi.

4.202 Area and yields of crops in Anantapur district of the zone are given in Table 26. Yields of rice and ragi are well above all-India and State averages. Yield of groundnut is less than all-India level. The performance of small millets and jowar is poor.

4.203 Sheep constitute 40 to 50 per cent of livestock followed by goats (15%) and male cattle (15%). The livestock pattern is :

S_3 G_4 Cm_4 Cf_4

TABLE 26

Area and Relative Yield Index Values of Crops in Zone XXIII

Crop	Area ('000 ha)	RYI*
Groundnut	233	82
small millets	150	41
bajra	62	89
ragi	27	148
total pulses	76·5	51
jowar kharif	116	62
rice	58	136

Rainfall Zone XXIV —D_1 E_3 (C_1 D_3) C_2 E_2

4.204 The district, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Gn_3 Pd_4 $S_4/B_4/R_4$	Madanapalle	Chittoo
	Punganur	,,
	Palamner	,,
Gn_2 Pd_4	Vayalpad	,,

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

4.205 The total area of the zone is 7008 sq km and areas of all taluks exceed 1000 sq km. The population of the zone is 8.7 lakhs with an average population density of 124 per sq km.

4.206 The zone is a plateau, heights ranging between 600 and 1200 masl.

4.207 Forests occupy 20 to 40 per cent of geographical area and land not available for cultivation is 18 to 28 per cent. Net sown area is 30 to 35 per cent.

4.208 Soils are red sandy and area under irrigation ranges from 20 to 25 per cent of cropped area.

4.209 The annual rainfall ranges from 75 to 85 cm in about 50 rainy days. September/October is the month of maximum rainfall and these two months account for 35 per cent of annual rainfall. September to November months get more than 10 cm pm.

4.210 Groundnut is the principal crop of this zone occupying about half of cropped area followed by paddy 13 to 22 per cent

4.211 Area and Relative Yield Index values of crops in Chittoor district are given in Table 27. The yields of all crops are above all-India level, groundnut being 152 and rice 140 per cent of all-India.

4.212 Sheep constitute 30 per cent of total livestock, followed by goats (15–20 per cent), female cattle (15 to 25 per cent), male cattle (15 per cent) and youngstock (11 per cent). The livestock pattern is :

S_3 G_4 Cf_4 Cm_4/Cy_4

TABLE 27

Area and Relative Yield Index Values of Crops in Zone XXIV

Crop	Area ('000 ha)	RYI*
groundnut	183	152
ragi	49·4	104
bajra	38·6	142
rice	124	140

Rainfall Zone XXV—D_1 E_3 (C_2 D_2) C_2 D_1 E_1

4.212 The district, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Gn_3 Pd_4 $S_4/B_4/R_4$	Bangarupalem	Chittoor
	Chittoor	,,
	Chandragiri	,,
	Puttur	,,

4.213 The area of the zone is 4790 sq. km. with the areas of taluks varying from 800 to 1600 sq km. The total population is 9.4 lakhs and the population density ranges from 160 to 270 per sq km.

4.214 Chandragiri taluk has elevations ranging from 600 to 1150 masl and elsewhere it is 100 to 600 masl.

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

4.215 Area under forests ranges generally between 20 to 30 per cent, with about 55 per cent in Chandragiri and land not available for cultivation is about 20 per cent. Net sown area is only 20 per cent of geographical area in Puttur and Chandragiri and 32 per cent elsewhere.

4.216 About 70 per cent of cropped area in Puttur is under irrigation, 50 per cent in Chandragiri and Chittoor and 33 per cent in Bangarupalem. Soils are red sandy.

4.217 The annual rain fall varies between 85 to 95 cm in about 50 rainy days. The months from August to November get 10—20 cm pm rainfall.

4.218 Groundnut and paddy are the main crops of the zone and account for more than 50 per cent of the gross cropped area; the other important crops are sugarcane, jowar and ragi. The Relative yield Index values have been given under zone XXIV for Chittoor district.

4.219 Sheep constitute 30 per cent of the total livestock followed by male cattle (20 per cent), female cattle (15 per cent) and goats (10 to 15 per cent). The livestock pattern is :

S_3 (Cm_4 Cf_4 G_4 Cy_4)

Rainfall Zone XXVI —D_1 E_3 (C_4) C_1 D_1 E_2

4.220 The districts, taluks and the cropping patterns included in the zone are :

Cropping Pattern	*Taluk*	*District*
Pd_2 Pu_4	Pithapuram	E. Godavari
Pd_2 $Pu_4/R_4/Fb_4$	Tekkali	Srikakulam
	Narsannapet	,,
	Pathapatnam	,,
	Srikakulam	,,
Pd_3 R_4 O_4	Ichchapuram	Srikakulam
	Sompeta	,,
Pd_3 Pu_4 B_4 O_4	Tuni	E. Godavari
	Prathipadu	,,
	Chodavaram	Visakhapatnam
	Yellamanchili	
Pd_3 Pu_4 Fr_4 To_5	Rajamundry	E. Godavari
	Peddapuram	,,
Pd_3 Gn_4 Fb_4/Pu_4	Vizianagram	Visakhapatnam
	Gajapatinagaram	,,
	Srungavarapukota	,,
	Bheemunipatnam	,,
Pd_3 Gn_4 Fb_4/Pu_4	Bobbili	Srikakulam
Pd_4 Fb_4 Gn_4 B_4 R_4	Salur	Srikakulam
B_3 Pd_4 R_4 O_4	Visakhapatnam	Visakhapatnam
Gn_3 Pd_4 Fb_4 B_4 Pu_4	Anakapalle	,,
Gn_3 Pd_4 Fb_4 B_4 Pu_4	Cheepurupalle	Srikakulam

4.221 This is a zone covering twenty two taluks located in the coastal districts of Srikakulam, Visakhapatnam and East Godavari. The area of the zone is 17225 sq km and the areas of taluks range from 225 to 1539 sq km. The total population of the zone is 54.5 lakh with an average population density of 316 per sq km.

4.222 Most of the taluks being in the coastal region the maximum elevation is 500—600 masl but only in two taluks, Pathapatnam and Gapapatinagaram the maximum elevation is 1100—1200 masl.

4.223 Area under forests is 30 per cent of geographical area in Salur, Srugavarapukota and Pathapatnan and 15 per cent in Sompeta and Bheemunipatnam. Land not available for cultivation is 15 to 30 per cent and fallow lands less than 10 per cent. Net sown area covers 40 to 60 per cent over most of the zone with Srikakulam ichchapuram and Bobbili having 70 per cent.

4.224 Coastal alluvium or red sandy soils prevail in the zone. Deltaic soils are present in Rajahmundry and Peddapuram with some laterite in Peddapuram. Area under irrigation is 90 per cent of cropped area in Salur and more than 40 per cent in most of the other taluks.

4.225 The annual average rainfall is 100 cm with September being the month of maximum rainfall. September and October together account for 35 to 40 per cent of the annual rainfall. All the five consecutive months June to October get 10—20 cm. pm. rainfall.

4.226 Paddy, ragi and other pulses are the main crops of this zone with paddy occupying more than 50 per cent of cropped area. The zone has eight cropping patterns, six beginning with paddy, one with groundnut and one with bajra.

4.227 The Relative Yield Index values of crops grown in this zone are given in Table 28. Paddy yields are low in Srikakulam and Visakhapatnam districts. Yield of ragi in Visakhapatnam and E. Godavari Districts is low. Yields of pulses are generally poor throughout the State but of groundnut and bajra are good.

4.228 Male cattle and sheep constitute a large per cent of the livestock population. The livestock patterns are :

Cm_4 Cf_4 S_4 G_4 Cy_4/Bf_4
S_4 G_4 Cm_4 Cf_4 Bm_4
B_4 Cm_4 Cf_4 By_4 G_4

TABLE 28

Relative Yield Index Values of Crops in Zone XXVI

District/Crop	Rice	Ragi	Total pulses	Groundnut	Bajra
Srikakulam	83	109	32	150	170
Visakhapatnam	89	68	23	97	123
East Godavari	119	84	32	—	103

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 XXVII—D_2 E_2 (B_1 C_3) C_1 D_1 E_2

4.229 The district, taluks, and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Pu_4 Pd_4 B_4 O_4/Jk_4 $Gn_4/Mt_4/Jk_4$	Narasapatnam	Visakhapatnam
Pu_3 Pd_4 Mt_4	Chintapalle	,,

4.230 The total area of the zone is 3719 sq km and population density is as low as 29 per sq km in Chintapalle and 200 in Narasapatnam.

4.231. The maximum elevation in Narasapatnam is 800 masl and 1700 masl in Chintapalle.

4.232 Area under forests is 62 per cent of geographical area in Chintapalle and 25 per cent in Narasapatnam. The net sown area is only 5 per cent in Chintapalle and 61 per cent in Narasapatnam.

4.233 Area under irrigation is 10 per cent of cropped area in Chintapalle and 23 per cent in Narasapatnam. Soils are coastal alluvium and red sandy in Narasapatnam and red sandy/loamy soils in Chintapalle.

4.234. Anual rainfall is 113 cm received in 70 rainy days. June to October months receive more than 10 cm pm rainfall.

4.235 Other pulses, paddy and small millets are the main crops cultivated in this zone. The Relative Yield Index values are given in Table 29. It will be seen that the yields are low.

4.236 In Chintapalle male cattle constitute 34 per cent of livestock, followed by female cattle (22 per cent) and youngstock cattle (21 per cent). The pattern is :

Cm_3 Cf_4 Cy_4/G_4

In Narsapatnam sheep and male cattle are predominant and the livestock pattern is :

S_4 Cf_4 G_4 Bf_4 Bm_4

TABLE 29

Relative Yield Index Values of Crops in Zone XXVII

Crop	RYI*
paddy	89
small millets	56
total pulses	23

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

Rainfall Zone XXVIII—D_2 E_2 (B_3 C_1) C_1 D_1 E_2

4.237 The districts, taluks and the cropping patterns included in the zone are :

Cropping pattern	*Taluk*	*District*
Pd_2 $Pu_4/R_4/Fb_4$	Parvathipuram	Srikakulam
Pd_3 Gn_4 Fb_4/Pu_4	Palakonda	,,
Pu_4 Pd_4 B_4 O_4/Jk_4 $Gn_4/$ Mt_4/Jk_4	Yellavaram	East Godavari
	Rampachodavaram	,,

4.238 The area of the zone is 6849 sq km and the areas of taluks vary from 1300 to 2200 sq km. The total population of the zone is 7.5 lakhs with taluk population density ranging from 40 to 285 per sq km.

4.239 Elevations vary widely from 150 to 1400 masl excepting in Palakonda where they range from 50—300 masl.

4.240 Yellavaram and Rampachodavaram in East Godavari district have 55 per cent of geographical area under forests, whereas it is 33 per cent in Parvathipuram and 15 per cent in Palakonda. The net sown area is only 8 per cent of geographical area in Yellavaram and Rampachodavarm, 27 per cent in Parvathipuram and 51 per cent in Palakonda.

4.241 The area under irrigation in Parvathipuram an Palakonda is about 50 per cent of cropped area and negligible elsewhere.

4.242 The annual average rainfall is about 120—130 cm. The month of maximum rainfall is July/August except in Ramapachodavaram where it is October. This zone has three consecutive months of July to September with 20—30 cm pm and 5 to 6 months from June with more than 10 cm pm.

4.243 Paddy is the principal crop in Parvathipuram and Palakonda taluks occupying 50 per cent of gross cropped area. Yields of principal crops of East Godavari district have already been discussed earlier. Relative Yield Index values of rice and total pulses in Srikakulam district are given below :

Crop	*RYI*
rice	83
total pulses	32

4.244 The yields of rice and total pulses are low.

4.245 Cattle constitute 70 per cent of total livestock in Yellavaram and Rampachodavaram and 40 per cent in Parvathipuram and Palakonda. The livestock patterns are :

Yellavaram, Rampachodavaram	Cm_4 Cf_4 G_4/Cy_4
Parvatipuram	Cm_4 S_4 G_4 Cf_4 Cy_4/Bm_4
Palakonda	S_4 Cm_4 G_4 Cf_4 Cy_4/Bm_4

Rainfall Zone (Special I) —E_4 (A_1 B_1 C_2) C_1 D_1 E_2

4.246 This zone comprises of Paderu taluk of Visakhapatnam district and the cropping pattern is Pd_3 R_4 O_4. The area of this taluk is 3105 sq km and the population is 1.8 lakhs with a population density of 59 per sq. km. It is an elevated plateau with elevations ranging from 1200 to 1680 masl.

4.247. The area under forests is 50 per cent of geographical area, land not available for cultivation 20 per cent, cultivable waste 10 per cent and fallow lands 8 per cent. Net sown area is only 14 per cent of geographical area. Nearly 25 per cent of cropped area is under irrigation and soils are red loamy.

4.248 The annual rainfall is about 120 cm. July is the month of maximum rainfall and together with August accounts for 50 per cent of annual rainfall.

4.249 Paddy occupies 39 per cent of cropped area, ragi (21 per cent), other oilseeds (16 per cent) and small millets (12 per cent). The Relative Yield Index values of rice, ragi and small millets are low being 89, 68 and 68 per cent of all-India level respectively.

4.250 Male cattle constitute 30 per cent of livestock, followed by goats (16 per cent) and male buffaloes (12 per cent). The livestock pattern is :

Cm_4 G_4 Bm_4 Cf_4

Rainfall Zone (Special II)—E_4 (A_2 B_2) D_1E_3

4.251 This zone comprises of Nugur taluk in Khammam district and the cropping pattern is Pd_2 Jr_4. Area is 1616 sq km and the population density 33 per sq km. The elevations range between 80 and 460 masl.

4.252 Area under forests is 82 per cent of geographical area and net sown area is 13 per cent. Only 20 per cent of area is irrigated and soils are red loamy.

4.253 The annual rainfall is about 150 cm. in 70 rainy days. The maximum rainfall occurs in July and together with August contributes more than fifty per cent of annual rainfall.

4.254 Paddy occupies 64 per cent of gross cropped area and jowar 15 per cent. The Relative Yield Index of paddy in Khammam district is 119 per cent and that of rabi jowar 113 per cent of all-India level.

4.255 Sheep, goats and buffaloes are negligible with only cattle dominating. The livestock pattern is :

Cf_3 Cm_4 Cy_4

Rainfall Zone (Special III)—D_1 E_3 (C_2 D_2) C_1 D_1 E_2

4.256 The zone comprises of Kuppam taluk in Chittoor district and the cropping pattern is R_4 Pd_4 Mt_4 Pu_4 Gn_4. The area of Kuppam is 756 sq km and the population is 1.1 lakhs with a population density of 150 per sq km. It is a plateau, heights ranging between 450 and 750 masl.

4.257 Area under forests is 36 per cent of geographical area, land not available for cultivation is 18 per cent and the net sown area **is about 40 percent** About

20 per cent of cropped area is irrigated. Soils are red sandy.

4.258 The annual rainfall is only 75 cm in 48 rainy days. September is the month of maximum rainfall and 55 per cent of annual rainfall occurs during September-October.

4.259 A number of crops are grown on more than 10 per cent of cropped area, with ragi occupying 23 per cent of cropped area. The Relative Yield Index values of rice and ragi are above all-India level.

4.260 Sheep constitute 32 per cent of total livestock followed by female cattle (25 per cent). The livestock pattern of the zone is :

S_3 Cf_4 G_4

5. FUTURE CROPPING PATTERNS—SOME OBSERVATIONS

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 grouped the rainfall patterns into zones and discussed how the other patterns viz. crops and livestock, 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 detail as is required for this analysis. Data on orography and population density have featured in this analysis but their exact role on cropping and livestock patterns could 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 pattern *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 following 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

(iv) 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 rainful patterns or zones and cropping patterns have been fully discussed in Section 2. For the purpose of locating suitable area 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 the 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, therefore, be cognisant of the demand for a crop, so that production efforts are not rendered futile because of lack of demand and marketing. The part each of the factors mentioned in item (v) of para 5.1 is likely to play in deciding croping patterns has already been discussed. 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 raifall intervals which form the basis of identifying rainfall patterns are subject to minor modifications. Thus, the condition that not less than 30 cm pm 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 in puts 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 Andhra Pradesh

5.5 Three crops of rice are taken in Andhra Pradesh in a year. The rainfall by itself is not sufficient to sustain any of the three crops. However, the performance of all the three crops is good because or irrigation. Diversifications could be attempted. It is possible to grow many other crops like cotton, groundnut, maize, fruits, vegetables, fodder grasses and legumes with advantage. Detailed studies with this objective are worthwhile.

5.6 The performance of cotton crop in Mahboobnagar. Kurnool and Anantapur districts is very poor. The rainfall in some or all of the monsoon months varies between 10 and 20 cm per month in these districts, which is insufficient for cotton growing. Unless

irrigation water could be provided for growing this crop, it is desirable to divert substantial area under cotton crop in these districts to some other hardy crops like castor and safflower.

5.7 Opinion is already in favour of reducing the area under tobacco in heavy black cotton soils and increasing the same in lighter soils. This will also require change in cropping patterns. The irrigation need of tobacco crop will also increase when it is diverted to lighter soils.

5.8 The area under tapioca could be increased. Rubber plantations could also be tried in this State provided varities suitable for its agro-climatic conditions could be evolved. The area under cashewnut and coconut could also be increased with advantage.

APPENDIX 1

Talukwise Land Use (1969-70) and Population Statistics

ANDHRA PRADESH

District/taluk	Population 1971		Forests	Nac	Cw	Pp&gl	Mtc&g	Fallow lands	Net area sown
	total	per sq. km							
1	2	3	4	5	6	7	8	9	10
	Rainfall Zone—I		..	..	..	*Rainfall Pattern—E_4 (D_3 E_1) B_2 C_1 E_1*			
Nellore									
Nellore	363166	278	8	15·5	5	15·5	3	12	41
Gudur	173436	145	7	31	4	25	3	2	28
Venkatagiri	112871	102	45	16·7	4	12	0·4	5	16·8
Atmakur	159567	96	10	22	14	9	5	5	35
Rapur	112192	73	36	15	10	10	1	4	24
	Rainfall Zone—II		..	..	..	*Rainfall Pattern—E_4 (C_1 D_2 E_1) C_2 E*			
Ongole									
Podili	113893	103	11	10	4	5	5	6	59
Kanigiri	181762	70	24	16	9	12	1	13	25
Darsi	142113	93		9	10	5	1	21	4
Markapur	174977	49		7	5	2	0.3	10	2
Guntur									
Virukonda	153111	92		14	3	9	7	2	43
	Rainfall Zone—III		..	..	..	*Rainfall Pattern—E_4 (C_1 D_2 E_1) B_1 C_1 E_2*			
Ongole									
Kandukur	274446	136	10	16	3	10	4·4	7·6	49
Ongole	311055	223	1	14	6	6	1	11	61
	Rainfall Zone—IV		..	..	..	*Rainfall Pattern—E_4 (C_1 D_2 E_1) B_2 E_2*			
Nellore									
Kovur	237465	238	7·3	17	2·4	13	3·6	9	47·7
Kavali	179416	122	9·6	26	10·7	3	1	20·6	29
Udayagiri	136781	61	31	20	14	13	1	4	17
	Rainfall Zone—V		..	..	..	*Rainfall Pattern—E_4 (C_1 D_3) D_1 E*			
Anantapur									
Gooty	195365	156	10	18	4	0·3	1	9·3	57
Tadpatri	182398	110	11	15	8	2	2	3	59
Kurnool									
Pattikonda	182945	95	4	13	3·5	0·5	—	8	71
Dhone	196698	91	20	10	8	1	1	13	47
	Rainfall Zone—VI		..	..	..	*Rainfall Pattern—E_4 (C_1 D_3) D_2 E*			
Cuddapah									
Pulivendla	148515	101	10	15·6	11·7	1	0·8	9	52
Jammalamadugu	157138	99	11	20	10	6	5	7	42
	Rainfall Zone—VII		..	..	..	*Rainfall Pattern—E_4 (C_1 D_3)*			
Cuddapah									
Rajampet	230216	86	84	1	0·3	0·5	0·2	1·4	12·4
Rayachoti	263663	92	31	20	8	5	1	7	28
	Rainfall Zone—VIII		..	..		*Rainfall Pattern—E_4 (C_1 D_3) A_1 B_1 C_1 E_1*			
Nellore									
Sulluppet	134694	91	9	40	10	13	1	8	19
Chittoor									
Srikalahasti	203975	129	34·5	26	5	1·7	1·7	6	25
Satyavedu	152831	152	42	17	2·5	3·6	0·8	6	28

— =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 of land use represent percentages to total reporting area.

APPENDIX I (*Contd.*)

1	2	3	4	5	6	7	8	9	10
	Rainfall Zone—IX		..	..	..	*Rainfall*	*Pattern—E_4*	*(C_2 D_2)*	*D_2*	*E_2*
Cuddapah										
Cuddapah	223286	169	42·4	13	2	3·2	0·3	2·4		37
Proddatur	221772	196	23	15	6	2	0·4	1		52
Kamalapuram	94779	121	2	17	11	5	0·2	7		58
	Rainfall Zone—X		..	..	..	*Rainfall*	*Pattern—E_4*	*(C_2 D_2)*	*C_2*	*E_2*
Cuddapah										
Badvel	142083	72	44	16	14	7	1	1	16·5	
Sidhout	95815	61	52	13	12	7	2	6	8	
	Rainfall Zone—XI		..	..	..	*Rainfall*	*Pattern—E_4*	*(C_3 D_1)*	*D_1*	*E_3*
Nalgonda										
Miryalguda	222366	119	10·5	10·4	7	3·5	2	27	40	
Ramannapet	224805	127	0·5	12	2	5·4	0·2	37	43	
Nalgonda	339943	138	3	14	1	4	1	30	46·4	
Bhongir.	243724	153	2·1	14	3	13	0·2	32	36	
Huzuranagar	261641	153	6·6	16·7	—	9	—	14·4	53·6	
Suryapet	288018	142	0·2	14	10	15	—	17	44	
Devarkonda	229241	85	17	7·2	1·2	2·2	0·3	25	47	
Hyderabad										
Hyderabad (U)	1776805	6267	—	63	2	6	0·4	15·6	13	
Hyderabad (E)	116433	175	11	25	5	15	1	15	28	
Hyderabad (W)	115721	222	2	35	1	19	3	10	30	
Chevella	117438	122	1	11	0·4	4	0·4	20	63	
Tandur	119699	125	18	11	1	3	0·3	2	65	
Ibrahimpatnam	146940	108	13	11	2	11	2	15·4	45·5	
Medchal	102836	134	10	19·4	3	19	2	20	26·4	
Kurnool										
Nandyal	199942	116	45	7	3·7	0·2	(neg)	4	40	
Allagadda	159127	101	29	7	10	0·2	—	5·4	48	
Koilkuntla	131583	90	3	18	10	0·1	—	16	53	
Banganapalli	69542	101	32	2	—	—	—	2	64	
Kurnool	334533	202	3	25	4	0·2	—	2	66	
Nandi Rotkur	118512	124	1	10	7·3	0·2	neg	12	69	
Atmakur	126159	67	75	0·4	—	—	—	0·6	24	
Alur	140301	88	3·3	7	1	—	—	2	86·4	
Adoni	322748	163	3	14	4	0·1	0·1	8	71	
Warangal										
Jangaon	349641	146	1	12	2	14	1	25	45	
Mahbubnagar										
Achampet	111079	38	66	8	0·4	2	0·1	2	21	
Gadwal	161906	121	1	10	1	5	0·1	4	79	
Nagarkurnool	177698	122	1	9	3	7	1	16	63	
Mahbubnagar	222356	187	14	12·4	3	4	1	14	51·4	
Wanaparthi	165746	119	6	10	1	4	1	36	42	
Atmakur	124041	107	2	12	3	4	0·4	15	64	
Shadnagar	165583	131	0·6	15	2	4	0·6	23	55	
Makhtal	158399	115	6	8	3	4	0·4	14	64	
Kollapur	148615	87	33·5	11	2	2	0·1	2	50	
Alampur	122836	109	—	10	1	2	0·1	4	83	
Kalvakurthi	200007	85	5	12	1	3	1	25	53	
Kodangal	173816	146	3	13	3	6	2	7	66	
Ongole										
Giddalur	201148	74	52	12	4	2	1	7	22	
	Rainfall Zone—XII		..	..	..	*Rainfall*	*Pattern—E_4*	*(C_3 D_1)*	*C_1*	*D_1*	*E_2*
Guntur										
Sattenapalle	332087	185	21·7	10	8	4·6	0·5	0·3	54·6		
Narasaraopet	310937	259	5	20	4	7	5	4	55		
Palnad	300425	112	28	23	2·6	3	0·6	2	41		

APPENDIX I (*Contd.*)

1	2	3	4	5	6	7	8	9	10
	Rainfall Zone—XIII		..	..	..	*Rainfall*	*Pattern—E_4*	*(C_3 D_1)*	*C_2 E_2*
Guntur									
Repalle	265821	336	11	14·3	4	3	4	3·4	60
Bapatla	299345	342	5	4	2	2	1	4	82
Ongole									
Chirala .	265406	305	0·2	22	1	2	2	18	55
Addanki	254997	184	2	11	2	7	0·4	14	64
	Rainfall Zone—XIV		..	..	..	*Rainfall Pattern—E_4*		*(C_4)*	*C_1 D_1 E_2*
Krishna									
Gudivada	253149	426	—	14	—	—	—	0·2	86
Kaikalur	187578	257	—	17	17	—	1	4	61
Gannavaram	233270	305	3	17	2	4	2	4	68
Vijayawada	604822	536	16	18	4	4	1	4	53
Jaggayyapet	79425	206	15	10	4	12	0·2	3	55
Nandigama	209074	200	9	14	1	8	0·3	1	67
Guntur									
Tenali	446947	529	—	14	—	1	3	2	80
Guntur	735815	503	1	9	3	1	1	3	82
	Rainfall Zone—XV		..	..	..	*Rainfall*	*Pattern—E_4*	*(C_4)*	*B_1 C_1 E*
East Godavari									
Kothapeta	199422	670	—	15	5	2	—	0·4	78
Alamur	173435	612	—	7	8	3	—	11	71
Kakinada	483773	486	25	12	7	1·6	2	1·6	50·5
Ramchandra Puram	267229	575	—	19	4	2	1	0·1	74
Mummidivaram	153171	438	12	9	12	—	3	4	60
Razole	216240	474	—	21	14	1	1	7	56
Amalapuram	263412	469	7	17	7	1	0·4	12	55
West Godavari									
Narsapur	394887	547	0·6	12	12	1	4	5	66
Krishna									
Bandar .	310619	322	1	22	25	0·4	6	5	41
Divi	280758	233	10	25	2	3	0·4	11	49
	Rainfall Zone—XVI		..	..	..	*Rainfall*	*Pattern—E_4*	*(B_1 C_3)*	*D_1 E_3*
Medak									
Narsapur	139341	129	57	4	2	1	1	3	32
Medak	201081	167	36	10	2	7	2	2	41
Zahirabad	189028	151	18	6	0·3	3	1	2	70
Narayankhed	122027	127	18	11	5	4	2	6	54
Sangareddy	204795	173	—	16	3·3	7	1·4	12	60
Andole	195460	156	15	12	3	4	2	5	59
Gajwel	163391	139	34	13	4	4	1	4	40
Siddipet	252821	178	23	12·7	3·6	8	1·5	7	45
Warrangal									
Narsampet	204586	101	40	17	1	3	0·3	9	30
Warrangal	650312	310	0·3	20	—	13	1	3	62
Mahbubabad	321715	183	10	10	1	4	0·2	17	58
Karimnagar									
Huzurabad	315767	218	—	23·5	4	9	1·7	21	41
Karimnagar	390282	209	1	12	2	8	0·3	33	44
Sirsilla	302043	162	16	18	2	6	1	16	41
Peddapalli	355498	194	12	15	3	6	1	17	46
Jagtial	283781	162	28	14	1	5	0·3	6	46
Manthani	119154	55	63·5	9	0·8	1·8	0·5	5	19·7
Nizamabad									
Kamareddy	201501	173	18	20	5	12	2	3	40

APPENDIX 1 (*Contd.*)

1	2	3	4	5	6	7	8	9	10
	Rainfall Zone—XVI (Contd.) ..			..	..	*Rainfall*	*Pattern—E_4*	(B_1 C_3)	D_1 E_3
Hyderabad									
Vicarabad	163955	133	12·5	14	3	3	3	8·6	56
Pargi	131935	131	5	12	1·5	8	1·5	22	50
Khammam									
Khammam	352822	201	5	18	2	8	1	3	63
Adilabad									
Lakshettipet	174801	92	35·4	17	3	3·3	0·1	12·1	29
Asifabad	139368	65	57·5	8·5	0·1	·4	·2	0·1	33·6
	Rainfall Zone—XVII ..			..	..	*Rainfall*	*Pattern—E_4*	(B_1 C_3)	C_1 D_1 E_2
W. Godavari									
Eluru	371361	281	4·7	20	8·8	4·6	0·9	6	55
Tadepalligudem	306678	330	4	18	5	4	1	6	62
Bheemavaram	338541	451	5	14	7	0·2	0·1	2	76
Tanuku	374138	674	—	13	2·8	1	1·5	2	79·6
Polavaram	135880	96	43	23·6	2	4	0·1	3	25
Chintalapudi	149157	138	13·2	22	10	6·3	2	2	44
Kobbur	303664	300	·2	25	2·8	0·8	0·6	6	64·8
Krishna									
Nuzvid	153727	177	13	14	5	4	5	5	54
	Rainfall Zone—XVIII ..			..	..	*Rainfall*	*Pattern—E_4*	(B_2 C_2)	D_1 E_3
Khammam									
Yellandu	229345	69	45	16	1	3	0·4	11	23
Bhoorgampadu	114882	56	78	5	1	0·4	0·1	1	15·6
Bhadrachalam	116502	48	83	3	1	—	neg	1	12
Kothagudam	229430	82	52	9	3	4	1	9	22
Madhira	274316	146	11	12	12	12	1	8	55
Karimnagar									
Metpalli	197403	207	4	9	3			22	57
Nizamabad									
Armur	298140	152	22	18	6	7	1	11	35
Krishna									
Tiruvur	186152	164	19	16	0·4	4	·1	3	57
	Rainfall Zone—XIX ..			..	..	*Rainfall*	*Pattern—E_4*	(B_3 C_1)	D_1 E_3
Nizamabad									
Nizamabad	304811	216	27	18	1	6	1	14	33
Banswada	124715	105	21	19	0·3	4	1	26	29
Yellareddy	103283	109	42	14	3	5	0·4	1	34
Bodhan	193026	243	3	15	1	4	1	17	59
Madnur	87792	146	16	2	1	1	—	2	78
	Rainfall Zone—XX ..			..	..	*Rainfall*	*Pattern—E_4*	(A_1 B_1 C_2)	D_1 E_3
Warangal									
Mulug	131236	41	56	9	1	2	1	18	13
Adilabad									
Khanapur	66237	82	63	7	0·5	2	0·5	3	24
Warangal									
Parkal	213443	157	3	10	2	6·6	1	32·7	45
Adilabad									
Adilabad	149810	100	24	6	4	3	3	6	54
Booth	89248	62	48	7·6	1·5	3	—	2	38
Utmur	93823	50	62	3	1	1	1	2	30
Mudhol	114837	110	5	10·8	3·4	5	0·2	5	71
Nirmal	172147	117	29	18	1·3	8·5	1	1	41
	Rainfall Zone—XXI ..			..	..	*Rainfall*	*Pattern—E_4*	(A_2 B_1 C_1)	D_1 E_3
Adilabad									
Sirpur	175675	79	44	15	2	2	0·3	3	33
Chinnur	112402	63	53	13	1	4	1	6	22

APPENDIX 1 (*Contd.*)

1	2	3	4	5	6	7	8	9	10
	Rainfall Zone—XXII ..			..	..	*Rainfall Pattern—D_1 E_3 (C_1 D_1 E_2)*		D_1	E_3
Anantapur									
Kalyandurg	162406	76	5·4	13·4	6·4	1·2	1·1	31·2	41·3
Rayadurg	169099	96	6	11	2	1	1	19	60
Uravakonda	109995	103	3	5	1	1	0·4	15	75
	Rainfall Zone—XXIII ..			..	..	*Rainfall Pattern—D_1 E_3 (C_1 D_2 E_1)*		C_1 D_1	E_2
Anantapur									
Kadiri	304611	102	19	27	10	1	0·2	8	35
Hindupur	217427	195	9	15·5	10	2	1·8	18	44
Penukonda	166269	94	18	20·3	12	4	2	25	19
Dharmavaram	172180	91	6	21	8	1	0·3	28	36
Anantapur	286700	120	8	17	6	1	2	23	43
Madakasira	148262	137	8	16	12·4	1	4·3	19	39
	Rainfall Zone—XXIV ..			..	..	*Rainfall Pattern—D_1 E_3 (C_1 D_3)*		C_2	E_2
Chittoor									
Madanapalle	284615	131	18	17·5	11	2	2	14	36
Vayalpad	254115	124	20·5	21	6·5	7	2·4	8	35
Punganur	201409	117	27	28	5	4	2	4	30
Palmaner	136247	128	40	17	3	0·3	0·4	5·7	34
	Rainfall Zone—XXV ..			..	..	*Rainfall Pattern—D_1 E_3 (C_2 D_2)*		C_2 D_1	E_1
Chittoor									
Bangarupalem	132402	163	20	20	5	1	1	21	32
Chittoor	271420	268	22	25·5	5·6	2	7	6	32
Chandragiri	271007	192	54·4	13·2	4	2·4	1	6	19
Puttur	263694	169	29	27	4	2	1	16	21
	Rainfall Zone—XXVI ..			..	..	*Rainfall Pattern—D_1 E_3 (C_4)*		C_1 D_1	E_2
East Godavari									
Pithapuram	188998	529	—	16	7	5	4	9	59
Srikakulam									
Tekkali	212037	301	8	33	1	0·3	1	1	56
Narasannapet	180963	349	—	22	3	2	1	6	66
Pathapatnam	261587	218	28	16	5	4	1	4	42
Srikakulam	257281	437	2	21	1	1	1	3	71
Ichchapuram	99199	440	—	17	3	2	2	4	72
Sompeta	160754	293	16·4	21·2	2	2	0·1	2·2	56
Salur	159610	155	27	24	2·5	3	0·6	6	37
Bobbili	281707	330	6	19	2	1	1	0·4	70
Cheepurupalle	361292	302	—	24	9	1	2	6	58
Visakhapatnam									
Vizianagaram	273247	397	8	23	1	8	3	2	55
Gajapathinagaram	143219	223	—	38	9	0·4	6	5	42
Srungavarapukota	238219	226	37	9·6	0·2	0·2	2	0·3	51
Bheemunipatnam	270300	310	17	20	3	0·9	1·8	5	53
Visakhapatnam	470666	927	4	51	14	1	2	1	27
Ankapalle	278593	354	8	23	6	0·5	7	6	50
Chodavaram	327950	213	34	23	2	0·1	1	2	38
Yellamanchili	282710	315	26	11	1	1	0·2	1	60
East Godavari									
Rajahmundry	464959	475	6	16	9	2	1	13	53
Peddapuram	225896	231	10	18	7	7	0·8	13·5	44
Prathipadu	159100	273	32	6	—	7	4	1	50
Tuni	153692	324	3·4	18·4	10	3	4	2	59
	Rainfall Zone—XXVII ..			..	..	*Rainfall Pattern—D_2 E_2 (B_1 C_3)*		C_1 D_1	E_2
Visakhapatnam									
Narasapatnam	269168	201	26	11	0·3	0·4	0·2	1	61
Chintapalle	68204	29	62	30	2	—	0·4	1	5

APPENDIX 1 (*Concld.*)

1	2	3	4	5	6	7	8	9	10
	Rainfall Zone—XXVIII	..	..	..	*Rainfall Pattern—D_2 E_2 (B_3 C_1) C_1 D_1 E_2*				
Srikakulam									
Parvathipuram	250509	164	33	29	6	1	2	2	27
Palakonda	365052	285	12·6	21	6·6	2	1	6	51
East Godavari									
Yellavaram	83610	38	53	9	23	5	0·2	2	8
Rampachodavaram	54325	30	56·4	24	2	3	4	2·8	7·5
	Rainfall Zone—Spl. I	..	..	..	*Rainfall Pattern—E_4 (A_1 B_1 C_2) C_1 D_1 E_2*				
Paderu	183090	59	48	19	9	0·6	1·7	8	14
	Rainfall Zone—Spl. II	..	..	..	*Rainfall Pattern—E_4 (A_2 B_2) D_1 E_3*				
Nugur	52535	33	82	3	1	—	0·4	1	13
	Rainfall Zone—Spl. III	..	..	..	*Rainfall Pattern—D_1 E_3 (C_2 D_2) C_1 D_1 E_2*				
Chittoor									
Kuppam	113821	150	35·4	14	3·3	6	1	·4	39

APPENDIX 2

Talukwise Livestock Population—1966

ANDHRA PRADESH

(thousands)

District/taluk	Cattle			Buffaloes			Sheep	Goats	Horses and ponies	Mules	Donkeys	Camels	Pigs	Total Livestock
	Male	Female	Young stock	Male	Female	Young stock								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Rainfall Zone—I										*Rainfall Pattern—E_4 (D_3 E_1) B_2 C_1 E_1*			
Nellore														
Nellore	45 (18)	42 (17)	39 (15)	23 (9)	38 (15)	25 (10)	16 (6)	23 (9)	— (—)	— (—)	1 (neg)	— (—)	2 (1)	252
Gudur	19 (12)	33 (22)	16 (10)	9 (6)	15 (10)	9 (6)	28 (18)	23 (15)	— (—)	— (—)	— neg (neg)	— (—)	1 (1)	153
Venkatagiri	20 (15)	19 (14)	10 (7)	5 (4)	12 (9)	7 (5)	48 (35)	15 (11)	— (—)	— (—)	— neg (neg)	— (—)	neg (neg)	136
Atmakur	19 (8)	26 (10)	16 (6)	8 (3)	26 (10)	21 (9)	96 (38)	41 (16)	— (—)	— (—)	— neg (neg)	— (—)	1 (neg)	254
Rapur	17 (8)	26 (13)	13 (6)	3 (1)	18 (9)	11 (5)	77 (37)	44 (21)	— (—)	— (—)	— neg (neg)	— (—)	neg (neg)	209
	Rainfall Zone—II										*Rainfall Pattern—E_4 (C_1 D_2 E_1) C_2 E_2*			
Ongole														
Podili	12 (8)	6 (4)	3 (2)	6 (4)	21 (14)	13 (9)	63 (42)	23 (16)	— (—)	— (—)	— (—)	— (—)	2 (1)	149
Kanigiri	18 (6)	13 (4)	9 (3)	11 (4)	42 (14)	24 (8)	114 (38)	66 (22)	— (—)	— (—)	1 (neg)	— (—)	2 (1)	300
Darsi	19 (9)	9 (4)	8 (4)	7 (3)	28 (13)	21 (9)	97 (43)	30 (13)	— (—)	— (—)	1 (neg)	— (—)	4 (2)	224
Markapur	22 (10)	14 (6)	10 (5)	5 (2)	34 (15)	20 (9)	85 (38)	28 (13)	— (—)	— (—)	— (—)	— (—)	5 (2)	223
Guntur														
Vinukonda	19 (10)	15 (8)	9 (5)	7 (4)	30 (16)	20 (11)	55 (30)	25 (14)	— (—)	— (—)	— (—)	— (—)	4 (2)	184
	Rainfall Zone—III										*Rainfall Pattern—E_4 (C_1 D_2 E_1) B_1 C_1 E_2*			
Ongole														
Kandukur	26 (8)	23 (7)	14 (4)	15 (5)	37 (11)	29 (9)	117 (35)	56 (17)	— (—)	— (—)	1 (neg)	— (—)	13 (4)	331
Ongole	24 (10)	15 (6)	12 (5)	17 (7)	41 (17)	31 (12)	69 (28)	24 (10)	neg (neg)	— (—)	— (—)	— (—)	13 (5)	246

	Rainfall Zone—IV										*Rainfall Pattern—E_4 (C_1 D_2 E_1) B_2 E_2*				
Nellore															
Kovur	35 (17)	33 (16)	21 (11)	17 (8)	33 (16)	19 (10)	14 (7)	24 (12)	— (—)	— (—)	neg (neg)	— (—)	5 (3)		201
Kavali	18 (10)	20 (11)	12 (7)	12 (7)	22 (12)	16 (9)	52 (29)	25 (14)	— (—)	— (—)	— (—)	— (—)	2 (1)		179
Udayag	11 (5)	10 (4)	6 (3)	7 (3)	27 (11)	17 (7)	112 (48)	44 (19)	— (—)	— (—)	1 (neg)	— (—)	neg (neg)		235
	Rainfall Zone—V			..		..		..		..	*Rainfall Pattern—E_4 (C_1 D_3) D_1 E_3*				
Anantapur															
Gooty	21 (18)	13 (11)	11 (9)	2 (2)	9 (8)	5 (5)	38 (32)	16 (14)	neg (neg)	— (—)	1 (1)	— (—)	1 (1)		118
Tadpatri	21 (14)	8 (5)	6 (4)	2 (1)	20 (14)	11 (8)	50 (34)	26 (18)	neg (neg)	— (—)	2 (1)	— (—)	1 (1)		147
Kurnool															
Pattikonda	34 (21)	18 (10)	12 (7)	1 (1)	14 (8)	6 (4)	55 (33)	23 (14)	neg (neg)	— —	1 (1)	— (—)	1 (1)		165
Dhone	36 (17)	23 (11)	14 (7)	1 (1)	21 (10)	9 (4)	63 (29)	43 (20)	— (—)	— (—)	1 (1)	— (—)	1 (1)		212
	Rainfall Zone—VI			..		..		..		..	*Rainfall Pattern—E_4 (C_1 D_3) D_2 E_2*				
Cuddapah															
Pulivendla	16 (12)	6 (4)	4 (3)	neg (neg)	23 (16)	13 (9)	50 (36)	26 (19)	— (—)	— (—)	1 (1)	— (—)	neg (neg)		139
Jammalamadugu	15 (11)	6 (5)	4 (3)	3 (2)	22 (17)	13 (10)	41 (31)	26 (20)	— (—)	— (—)	2 (1)	— (—)	1 (0·3)		133
	Rainfall Zone—VII			..		..		..		..	*Rainfall Pattern—E_4 (C_1 D_3) C_2 E_2*				
Cuddapah															
Rajampet	30 (15)	21 (11)	12 (6)	7 (3)	25 (13)	10 (5)	45 (23)	44 (22)	— (—)	— (—)	1 (1)	— (—)	1 (1)		196
Rayachoti	50 (16)	48 (15)	26 (8)	5 (2)	20 (6)	11 (4)	100 (32)	52 (16)	— (—)	— (—)	1 (neg)	— (—)	4 (1)		317
	Rainfall Zone—VIII			..		..		..		..	*Rainfall Pattern—E_4 (C_1 D_3) A_1 B_1 C_1 E_1*				
Nellore															
Sullurpet	21 (19)	23 (20)	11 (10)	7 (6)	9 (8)	5 (4)	25 (22)	12 (11)	— (—)	— (—)	neg (neg)	— (—)	neg (neg)		113
Chittoor															
Srikalahasti	34 (21)	25 (16)	14 (9)	5 (3)	14 (9)	8 (5)	40 (25)	17 (11)	neg (neg)	— (—)	neg (neg)	— (—)	1 (1)		158
Satyavedu	23 (20)	21 (18)	11 (9)	4 (3)	10 (9)	4 (3)	25 (21)	17 (15)	(— (—)	—	— (—)	— (—)	2 (2)		117

neg=neglible

Note : Figures in brackets represent percentages to total livestock.

APPENDIX 2 (*Contd.*)

(thousands)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Rainfall Zone—IX	..		..		..			..		*Rainfall Pattern—E_4 (C_2 D_2)*		D_2	E_2
Cuddapah														
Cuddapah	15 (14)	6 (6)	3 (3)	6 (5)	19 (17)	10 (9)	36 (33)	14 (12)	neg (neg)	— (—)	neg (neg)	— (—)	1 (1)	111
Proddatur	15 (13)	5 (4)	2 (2)	6 (5)	24 (20)	12 (11)	38 (32)	14 (12)	— (—)	— (—)	1 (1)	— (—)	0·3 (neg)	117
Kamalapuram	12 (11)	2 (2)	2 (2)	3 (3)	18 (17)	11 (10)	45 (41)	13 (12)	— (—)	— (—)	1 (1)	— (—)	1 (1)	108
	Rinfall Zone—X	..		..		..			..		*Rainfall Pattern—E_4 (C_2 D_2)*		C_2	E_2
Cuddapah														
Badvel	11 (6)	3 (2)	3 (2)	5 (3)	18 (11)	12 (7)	76 (45)	42 (24)	— (—)	— (—)	neg (neg)	— (—)	neg (neg)	170
Sidhout	10 (9)	7 (7)	4 (3)	1 (1)	16 (14)	7 (6)	41 (36)	25 (22)	— (—)	— (—)	1 (1)	— (—)	1 (1)	113
	Rainfall Zone—XI	..		..		..			..		*Rainfall Pattern—E_4 (C_2 D_1)*		D_1	E_2
Nalgonda														
Miryalguda	41 (15)	39 (14)	39 (14)	8 (3)	18 (7)	16 (6)	76 (28)	30 (11)	— (—)	— (—)	— (—)	— (—)	4 (2)	271
Ramannapet	41 (16)	33 (12)	22 (8)	19 (7)	18 (7)	14 (5)	78 (29)	36 (14)	— (—)	— (—)	— (—)	— (—)	4 (2)	265
Nalgonda	69 (19)	48 (13)	28 (8)	21 (6)	29 (8)	20 (5)	96 (27)	46 (13)	— (—)	— (—)	— (—)	— (—)	5 (1)	362
Bhongir	64 (18)	50 (14)	32 (9)	21 (6)	22 (6)	19 (5)	109 (30)	40 (11)	1 (neg)	— (—)	— (—)	— (—)	2 (1)	360
Huzurnagar	36 (14)	48 (18)	27 (11)	14 (5)	30 (11)	22 (9)	54 (21)	21 (8)	— (—)	— (—)	— (—)	— (—)	7 (3)	259
Suryapet	48 (15)	51 (16)	33 (10)	19 (6)	27 (9)	21 (6)	85 (27)	28 (9)	— (—)	— (—)	— (—)	— (—)	6 (2)	318
Devarkonda	58 (19)	50 (17)	30 (10)	8 (3)	14 (5)	10 (4)	86 (30)	33 (11)	— (neg)	— (—)	— (—)	— (—)	3 (1)	293
Hyderabad														
Hyderabad (U)	7 (11)	6 (10)	4 (6)	2 (3)	21 (33)	6 (10)	3 (5)	11 (17)	0·1 (2)	— (—)	— (—)	— (—)	2 (3)	63
Hyderabad (E)	17 (19)	8 (9)	5 (5)	5 (5)	12 (13)	5 (5)	20 (21)	18 (19)	3 (3)	— (—)	neg (neg)	— (—)	1 (1)	94
Hyderabad (W)	13 (23)	6 (11)	5 (10)	2 (3)	5 (9)	3 (6)	11 (20)	9 (17)	1 (1)	— (—)	neg (neg)	— (—)	neg (neg)	55
Chevella	25 (19)	12 (9)	9 (7)	2 (1)	6 (5)	4 (3)	58 (45)	13 (10)	— (—)	— (—)	1 (1)	— (—)	neg (neg)	130
Tandur	23 (25)	15 (16)	11 (12)	3 (3)	7 (7)	3 (4)	18 (20)	11 (12)	1 (1)	— (—)	neg (neg)	— (—)	neg (neg)	92
Ibrahimpatnam	35 (19)	23 (13)	15 (9)	7 (4)	11 (6)	8 (4)	49 (27)	29 (16)	1 (1)	— (—)	neg (neg)	— (—)	2 (1)	180
Medchal	23 (23)	14 (14)	9 (9)	6 (6)	11 (11)	6 (6)	14 (14)	15 (16)	neg (neg)	— (—)	neg (neg)	— (—)	1 (1)	99
Nalgonda														
Nandyal	18 (13)	11 (7)	12 (9)	1 (1)	28 (19)	19 (13)	30 (22)	18 (13)	neg (neg)	— (—)	1 (1)	— (—)	2 (2)	140

Allagadda	17 (18)	7 (8)	3 (3)	1 (1)	23 (24)	9 (9)	25 (27)	8 (8)	— (—)	— (—)	1 (1)	— (—)	1 (1)	95
Koilkuntla	16 (14)	6 (6)	4 (3)	1 (1)	22 (19)	11 (10)	28 (25)	22 (20)	— (—)	— (—)	1 (1)	— (—)	1 (1)	112
Bangana palli	9 (13)	5 (8)	2 (4)	neg (neg)	11 (17)	5 (8)	16 (26)	14 (23)	— (—)	— (—)	1 (1)	— (—)	neg (neg)	63
Kurnool	32 (16)	15 (7)	9 (4)	3 (2)	21 (10)	9 (4)	82 (41)	28 (14)	neg (neg)	— (—)	1 (neg)	— (—)	3 (2)	203
Nandikotkur	15 (14)	9 (9)	5 (4)	1 (1)	14 (13)	7 (7)	39 (38)	11 (11)	1 (1)	— (—)	1 (1)	— (—)	1 (1)	104
Atmakur	15 (21)	7 (11)	3 (4)	1 (1)	17 (24)	6 (9)	15 (21)	5 (7)	— (—)	— (—)	1 (1)	— (—)	1 (1)	71
Alur	22 (23)	10 (11)	10 (11)	neg (neg)	11 (12)	6 (6)	16 (17)	17 (19)	neg (neg)	— (—)	neg (neg)	— (—)	1 (1)	93
Adoni	39 (22)	20 (11)	12 (7)	2 (1)	13 (8)	6 (3)	53 (30)	31 (18)	neg (neg)	— (—)	neg (neg)	— (—)	1 (1)	177
Warangal														
Jangaon	53 (17)	51 (16)	32 (10)	23 (7)	28 (9)	18 (6)	73 (24)	31 (10)	—	—	—	—	4 (1)	313
Mahbubnagar														
Achampet	27 (19)	32 (22)	20 (14)	3 (2)	7 (5)	5 (3)	31 (21)	19 (13)	— (—)	— (—)	neg (neg)	— (—)	1 (1)	145
Gadwal	33 (18)	16 (9)	10 (6)	5 (3)	8 (4)	4 (2)	85 (48)	16 (9)	neg (neg)	— (—)	neg (neg)	— (—)	1 (1)	178
Nagarkurnool	40 (21)	31 (17)	19 (10)	6 (3)	11 (6)	8 (4)	57 (31)	14 (7)	neg (neg)	— (—)	— (—)	— (—)	2 (1)	188
Mahbubnagar	39 (20)	31 (16)	19 (10)	9 (5)	10 (5)	6 (3)	58 (31)	17 (9)	neg (neg)	— (—)	neg (neg)	— (—)	1 (1)	190
Wanaparthi	36 (19)	22 (11)	13 (7)	7 (4)	9 (5)	6 (3)	83 (43)	14 (7)	— (—)	— (—)	neg (neg)	— (—)	3 (1)	193
Atmakur	26 (21)	11 (9)	7 (6)	4 (3)	5 (4)	3 (3)	56 (46)	8 (7)	neg (neg)	— (—)	— (—)	— (—)	1 (1)	121
Shadnagar	39 (21)	33 (18)	25 (13)	8 (4)	10 (5)	6 (3)	46 (24)	21 (11)	neg (neg)	— (—)	neg (neg)	— (—)	1 (1)	189
Makhtol	16 (13)	14 (11)	9 (7)	6 (5)	6 (5)	3 (2)	61 (48)	11 8	neg (neg)	— (—)	1 (1)	— (—)	1 (1)	128
Kolhapur	35 (21)	25 (15)	13 (8)	4 (2)	9 (5)	6 (3)	62 (37)	12 (7)	neg (neg)	— (—)	neg (neg)	— (—)	3 (2)	16
Alampur	20 (18)	10 (9)	5 (5)	3 (3)	8 (7)	4 (3)	46 (42)	13 (12)	neg (neg)	— (—)	— (—)	— (—)	1 (1)	110
Kalakurthi	50 (20)	45 (17)	30 (11)	10 (4)	14 (5)	12 (5)	68 (26)	27 (11)	neg (neg)	— (—)	neg (neg)	— (—)	1 (1)	257
Kodangal	40 (27)	29 (20)	19 (13)	9 (6)	8 (6)	5 (3)	18 (12)	15 (10)	1 (1)	— (—)	1 (1)	— (—)	1 (1)	146
Ongole										—				
Giddalur	19 (12)	12 (7)	7 (4)	5 (3)	36 (22)	16 (10)	42 (26)	21 (13)	— (—)	— (—)	1 (neg)	— (—)	2 (1)	161

APPENDIX 2 (*Contd.*)

(thousands)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Rainfall Zone—XII	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (C_3 D_1) C_1 D_1 E_2*				
Guntur														
Sattanapalli	29	22	9	12	55	32	72	29	—	—	neg	—	10	270
	(11)	(8)	(3)	(4)	(20)	(12)	(27)	(11)	(—)	(—)	(—)	(—)	(4)	
Narasaraopet	23	7	6	13	43	33	64	21	neg	—	—	—	12	222
	(10)	(3)	(3)	(6)	(19)	(15)	(29)	(10)	(neg)	(—)	(—)	(—)	(5)	
Palnad	29	17	10	5	48	27	68	24	neg	—	neg	—	12	240
	(12)	(7)	(4)	(2)	(21)	(11)	(28)	(10)	(neg)	(—)	(neg)	(—)	(5)	
	Rainfall Zone—XIII	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (C_3 D_1) C_2 E_2*				
Guntur														
Repalle	16	11	7	11	38	24	14	7	neg	—	—	—	3	131
	(12)	(9)	(5)	(9)	(29)	(18)	(10)	(5)	(neg)	(—)	(—)	—	(2)	
Bapatla	14	5	4	16	46	40	16	8	neg	—	—	—	6	155
	(9)	(3)	(3)	(10)	(30)	(26)	(10)	(5)	(neg)	(—)	(—)	(—)	(4)	
Ongole														
Chirala							—na.—							
Addanki							—n.a.—							
	Rainfall Zone—XIV	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (C_4) C_1 B_1 E_2*				
Krishna														
Gudivada	13	9	6	2	31	18	5	4	—	—	—	—	3	91
	(14)	(10)	(7)	(2)	(34)	(20)	(6)	(4)	(—)	(—)	(—)	(—)	(3)	
Kaikalur	12	7	4	16	22	8	5	4	—	—	—	—	2	80
	(15)	(9)	(5)	(20)	(28)	(10)	(6)	(5)	(—)	(—)	(—)	(—)	(2)	
Gannavaram	15	11	8	2	37	25	8	5	—	—	—	—	4	115
	(13)	(10)	(7)	(2)	(32)	(22)	(7)	(4)	(—)	(—)	(—)	(—)	(3)	
Vijayawada	17	16	11	9	43	38	22	10	neg	—	—	—	6	172
	(10)	(9)	(6)	(5)	(25)	(22)	(13)	(6)	(neg)	(—)	(—)	(—)	(4)	
Jaggayyapet	5	7	6	3	8	7	11	1	neg	—	—	—	3	52
	(12)	(13)	(12)	(6)	(15)	(13)	(21)	(2)	(neg)	(—)	(—)	(—)	(6)	
Nandigama	16	16	11	66	33	23	29	11	—	—	neg	—	6	153
	(10)	(10)	(7)	(5)	(22)	(15)	(19)	(7)	(—)	(—)	(neg)	(—)	(4)	
Guntur														
Tenali	17	12	9	19	54	42	15	6	neg	—	—	—	8	182
	(9)	(7)	(5)	(11)	(30)	(23)	(8)	(3)	(neg)	(—)	(—)	(—)	(4)	
Guntur	30	9	7	11	67	66	40	13	—	—	—	—	11	254
	(12)	(3)	(3)	(4)	(26)	(26)	(16)	(5)	(—)	(—)	(—)	(—)	(5)	
	Rainfall Zone—XV	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (C_4) B_1 C_1 E_2*				
East Godavari														
Kothapeta	10	6	5	1	13	8	3	4	neg	—	—	—	2	52
	(20)	(11)	(9)	(2)	(25)	(15)	(6)	(8)	(neg)	(—)	(—)	(—)	(4)	
Kakinada	22	15	13	20	21	14	3	6	neg	—	—	—	2	116
	(19)	(13)	(11)	(17)	(18)	(12)	(3)	(5)	(neg)	(—)	(—)	(—)	(2)	

Ramachandrapuram	26 (20)	17 (13)	14 (11)	16 (12)	28 (22)	19 (15)	2 (2)	4 (3)	neg (neg)	— (—)	— (—)	— (—)	3 (2)	129
Alamuru							——n.a.——							
Mummidvaram							——n.a.——							
Amalapuram	27 (22)	16 (13)	14 (11)	15 (12)	21 (17)	13 (11)	6 (5)	7 (6)	neg (neg)	— (—)	— (—)	— (—)	4 (3)	123
Razole	14 (19)	10 (14)	9 (13)	6 (8)	15 (21)	9 (13)	3 (4)	4 (5)	neg (neg)	— (—)	— (—)	— (—)	2 (3)	72
West Godavari														
Narsapur	24 (20)	12 (10)	10 (8)	17 (14)	32 (26)	13 (11)	2 (2)	8 (6)	neg (neg)	— (—)	— (—)	— (—)	4 (3)	122
Krishna														
Bandar	16 (17)	10 (11)	6 (7)	9 (9)	27 (28)	12 (13)	5 (6)	7 (7)	— (—)	— (—)	— (—)	— (—)	2 (2)	94
Divi	22 (12)	20 (10)	16 (8)	5 (3)	50 (26)	41 (22)	17 (9)	12 (6)	— (—)	— (—)	— (—)	— (—)	7 (4)	190
	Rainfall Zone—XVI			..		..		..		..	*Rainfall Pattern—E_4 (B_1 C_3) D_1 E_3*			
Medak														
Narsapur	26 (18)	21 (15)	16 (11)	6 (4)	6 (4)	4 (3)	31 (22)	31 (22)	— (—)	— (—)	— (—)	— (—)	1 (1)	142
Medak	36 (22)	26 (16)	21 (13)	11 (7)	8 (5)	7 (4)	36 (22)	17 (10)	— (—)	— (—)	— (—)	— (—)	2 (1)	164
Zahirabad	33 (26)	24 (18)	17 (13)	1 (1)	10 (8)	5 (4)	16 (13)	18 (14)	2 (1)	— (—)	1 (1)	— (—)	1 (1)	128
Narayankhed	20 (18)	23 (21)	14 (13)	2 (2)	10 (9)	6 (5)	16 (15)	15 (14)	2 (2)	— (—)	1 (1)	— (—)	— (—)	109
Sangareddy	27 (20)	17 (13)	14 (11)	3 (2)	9 (7)	6 (4)	41 (30)	15 (11)	1 (0·4)	— (—)	0·3 (·2)	— (—)	1 (1)	134
Andole	33 (20)	25 (15·5)	17 (11)	6 (4)	9 (5)	5 (3)	50 (31)	13 (8)	1 (1)	— (—)	1 (0·4)	— (—)	1 (1)	161
Gajwel	37 (21·7)	28 (16)	18 (10·5)	13 (7·6)	12 (7)	8 (5)	36 (21)	17 (10)	1 (0·4)	— (—)	0·1 (0·1)	— (—)	2 (1)	171
Siddipet	53 (19)	40 (14·5)	26 (9)	15 (6)	17 (6)	14 (5)	78 (29)	26 (9)	1 (0·4)	— (—)	0·4 (0·2)	— (—)	4 (2)	273
Warangal														
Narsampet	30 (14)	43 (20)	29 (14)	7 (3·4)	11 (5·4)	9 (4)	65 (31)	11 (5)	— (—)	— (—)	— (—)	— (—)	6 (3)	210
Warangal	82 (18)	69 (15)	44 (10)	18 (4)	34 (7)	24 (5)	136 (30)	36 (8)	— (—)	— (—)	1 (0·1)	— (—)	43 (3)	457
Mahbubabad	49 (14·4)	69 (20·4)	63 (18·4)	15 (4·4)	22 (7)	18 (5)	69 (20)	29 (8·4)	— (—)	— (—)	— (—)	— (—)	6 (2)	340
Karimnagar														
Huzurabad	65 (22)	37 (12)	21 (7)	10 (4)	14 (5)	10 (4)	118 (40)	13 (4)	1 (·1)	4 (2)	— (—)	— (—)	— (—)	292
Karimnagar	83 (23)	45 (12)	30 (8)	14 (4)	20 (6)	16 (4)	126 (35)	24 (7)	— (—)	— (—)	— (—)	— (—)	5 (1)	363
Sirsilla	70 (23)	34 (11)	27 (9)	19 (6)	18 (6)	15 (5)	98 (32)	22 (7)	— (—)	— (—)	0·3 (neg)	— (—)	2 (1)	306
Sultanabad	36 (12)	38 (13)	28 (10)	9 (3)	17 (6)	14 (5)	124 (43)	20 (7)	— (—)	— (—)	— (—)	— (—)	3 (1)	289
Jagtial	57 (23)	31 (12)	23 (9)	9 (4)	13 (5)	11 (5)	87 (35)	19 (8)	— (—)	— (—)	— (—)	— (—)	2 (1)	252

APPENDIX 2—(*Contd.*)

(thousands)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Rainfall Zone—XVI (Contd.)	..		..		..		..			*Rainfall Pattern—$E_4(B_1C_3)D_1E_2$*			
Munthani	36	25	19	2	7	6	22	6	—	—	—	—	1	125
	(29)	(20)	(15·5)	(2)	(6)	(4·7)	(17·6)	(4·7)	(—)	(—)	(—)	(—)	(0·7)	
Nizamabad														
Kamareddy	39	23	14	3	10	7	45	14	—	—	—	—	1	158
	(24)	(15)	(9)	(2)	(6·6)	(4·6)	(29)	(9)	(—)	(—)	(—)	(—)	(1)	
Hyderabad														
Vicarabad	33	22	18	3	8	4	25	24	0·4	—	—	—	2	140
	(24)	(16)	(13)	(2)	(5·4)	(3)	(18)	(17)	(0·2)	(—)	(—)	(—)	(1·2)	
Pargi	30	20	16·7	6	7	5	39	22	0·6	—	0·6	—	2	
	(20)	(13·4)	(11)	(4)	(5)	(3·4)	(26)	(15)	(0·4)	(—)	(0·4)	(—)	(1·2)	148
Khammam														
Khammam	37	47	34	20	38	36	53	33	—	—	—	—	9	307
	(12)	(15)	(11)	(6·4)	(12)	(12)	(17·3)	(11)	(—)	(—)	(—)	(—)	(3)	
Adilabad														
Laksheltipet	27·7	18·6	13	2	6	4	23	5	1	—	—	—	1	101
	(28)	(18)	(13)	(2)	(6)	(4)	(22)	(5)	(1)	(—)	(—)	(—)	(1)	
Asifabad	31·4	24·3	16	1	5	3	13·3	12	—	—	—	—	2	107
	(29)	(22·6)	(15)	(0·6)	(4)	(3)	(12)	(12)	(—)	(—)	(—)	(—)	(2)	
	Rainfall Zone—XVII			..		..		..		..	*Rainfall Pattern—E_4 (B_1 C_3) C_1 D_1 E_2*			
West Godavari														
Eluru	30	31·3	18·5	12·3	30·4	21·4	18·4	12·5	0·1	—	—	—	9	184
	(16)	(17)	(10)	(7)	(17)	(12)	(10)	(7)	(0·1)	(—)	(—)	(—)	(5)	
Tadepalligudem	29	24·4	14·2	11·2	28	15·2	20·2	8	—	—	—	—	5·4	156
	(19)	(16)	(9)	(7)	(18)	(10)	(13)	(5)	(—)	(—)	(—)	(—)	(3)	
Bheemavaram	14	10	7	23	30	14	1	5	0·1	—	—	—	5	109
	(13)	(10)	(6)	(21)	(27)	(13)	(1)	(4)	(0·1)	(—)	(—)	(—)	(5)	
Tanuku	22	11	8	6	32	16	3	4	0·1	—	—	—	7	109
	(20)	(10)	(7)	(6)	(30)	(14)	(3)	(4)	(0·1)	(—)	(—)	(—)	(6)	
Polavaram	28·6	28	17·7	2	11	7	9	11	—	—	—	—	4	117
	(24·4)	(24)	(15)	(1)	(9·4)	(6)	(7)	(9)	(—)	(—)	(—)	(—)	(4)	
Chintalapudi	33	31	17	4	20	11	22	18	—	—	—	—	3	159
	(21)	(19·6)	(10·6)	(2·5)	(12·7)	(7)	(14)	(11)	(—)	(—)	(—)	(—)	(2)	
Kovvur	31	22	20	3	19	15	18	23	0·1	—	—	—	6	156
	(19·7)	(13·8)	(12·7)	(2)	(12)	(10)	(11·5)	(14·6)	(0·1)	(—)	(—)	(—)	4)	
Krishna														
Nuzvid	19	20	13	5	23	14	15	13	—	—	—	—	2	123
	(15)	(16)	(10)	(4)	(19)	(12)	(12)	(10·4)	(—)	(—)	(—)	(—)	(1·3)	
	Rainfall Zone—XVIII			..		..		..		..	*Rainfall Pattern—E_4 (B_2 C_2) D_1 E_3*			
Khammam														
Yellandu	42	59	33	7	19	12	31	24	—	—	—	—	4	232
	(18)	(25·4)	(14·2)	(3)	(8·3)	(5)	(13·4)	(10·3)	(—)	(—)	(—)	(—)	(2)	
Bhoorgampadu	26	28	18	3	8	6	6	8	—	—	—	—	3	107
	(24)	(26)	(17)	(3)	(8)	(5)	(6)	(8)	(—)	(—)	(—)	(—)	(2)	
Bhadrachalam	31	31	20	4	8	5	4	17	—	—	—	—	7	128
	(24)	(24)	(16)	(3·4)	(6)	(4)	(3)	(13)	(—)	(—)	(—)	(—)	(6)	
Kottagudam	34	43	34	4	15	15	17	22	—	—	—	—	5	188
	(18)	(23)	(18)	(2)	(8)	(8)	(8)	(12)	(—)	(—)	(—)	(—)	(2·4)	

Madhira	37 (15·5)	35 (15)	23 (10)	17 (7)	44 (18·5)	29 (13)	27 (11)	19 (8)	— (—)	— (—)	— (—)	— (—)	4 (2)	235
Karimnagar														
Metpalle	55 (31)	18 (10)	12 (7)	9 (5)	10 (5)	8 (4)	59 (32)	10 (5)	— (—)	— (—)	— (—)	— (—)	1 (0·4)	181
Nizamabad														
Armur	49 (23)	27 (12·5)	19 (8·6)	5 (2)	20 (9)	17 (8)	60 (28)	18 (8)	— (—)	— (—)	— (—)	— (—)	1 (1)	217
Krishna														
Tiruvur	24 (14)	22 (13)	13 (8)	13 (7·5)	29 (17)	18 (11)	29 (18)	16 (10)	— (—)	— (—)	— (—)	— (—)	4 (2)	168
	Rainfall Zone—XIX			..		..		..		..	*Rainfall Pattern—E_4 (B_3 C_1) D_1 F_3*			
Nizamabad														
Nizamabad	38 (25)	21 (14)	14 (9)	3 (2)	16 (10)	12 (7·6)	37 (24)	12 (7·6)	— (—)	— (—)	— (—)	— (—)	1 (1)	154
Banswada	20 (22)	18 (20)	12 (13)	6 (6)	6 (7)	4 (5)	14 (16)	9 (10)	0·2 (0·3)	— (—)	— (—)	— (—)	1 (1)	90
Yellareddy	22 (23·5)	20 (21·5)	17 (19)	3 (3)	4 (4)	3 (3)	14 (16)	8 (9)	— (—)	— (—)	— (—)	— (—)	0·4 (1)	91
Bodhan	22 (28)	11 (14)	8 (10)	4 (5)	11 (13)	7 (9)	10 (12)	5 (7)	0·1 (0·2)	— (—)	— (—)	— (—)	0·4 (1)	79
Madnur	12 (18)	12 (19)	9 (13·4)	1 (2)	6 (9·4)	5 (7)	8 (12)	11 (17)	0·4 (1)	— (—)	1 (2)	— (—)	0·2 (0·4)	66
	Rainfall Zone—XX			..		..		..		..	*Rainfall Pattern—E_4 (A_1 B_1 C_2) D_1 E_3*			
Warangal														
Mulug	29 (22)	31 (24)	21 (16)	6 (4)	11 (8)	8 (6)	15 (11)	10 (8)	— (—)	— (—)	— (—)	— (—)	1 (1)	132
Adilabad														
Khanapur	14 (26)	13 (23)	9 (15)	2 (3)	3 (5)	2 (4)	9 (15)	4 (8)	— (—)	— (—)	— (—)	— (—)	0·2 (1)	56
Warangal														
Parkal	45 (23)	31 (16)	19 (9)	5 (3)	11 (6)	8 (4)	62 (32)	9 (5)	— (—)	— (—)	— (—)	— (—)	4 (2)	19
Adilabad														
Adilabad	34 (33)	28 (27)	12 (12)	1 (1)	8 (8)	3 (3)	5 (5)	11 (11)	0·2 (0·2)	— (—)	— (—)	— (—)	0·4 (·4)	103
Boath	20 (30)	19 (29)	10 (16)	0·2 (0·3)	5 (8)	3 (5)	2 (3)	5 (8)	— (—)	— (—)	— (—)	— (—)	— (—)	
Utnur	19 (33)	17 (30)	12 (20)	0·2 (0·5)	3 (4)	1 (2)	0·3 (1)	5 (9)	0·1 (0·2)	— (—)	— (—)	— (—)	— (—)	58
Mudhol	21 (23)	19 (21)	18 (20)	0·1 (0·2)	6 (7)	4 (5)	10 (11)	11 (11)	0·2 (0·3)	— (—)	1 (1)	— (—)	0·4 (1)	92
Nirmal	31 (23)	25 (19)	17 (13)	2 (1)	14 (10)	10 (7)	25 (18)	10 (8)	— (—)	— (—)	0·2 (0·1)	— (—)	1 (0·4)	134
	Rainfall Zone—XXI			..		..		..		..	*Rainfall Pattern—E_4 (A_2 B_1 C_1) D_1 E_3*			
Adilabad														
Sirpur	38 (34)	26 (23·6)	20 (18)	1 (0·6)	6 (5)	4 (3)	4 (4)	10 (9)	0·1 (·1)	— (—)	0·2 (0·2)	— (—)	1 (1)	110
Chinnur	30 (27)	24 (22)	20 (18)	1 (1)	5 (4)	4 (4)	20 (18)	6 (5)	0·3 (0·3)	— (—)	— (—)	— (—)	1 (1)	112

thousands).

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Rainfall Zone—XXII			..		..		..			*Rainfall Pattern—D_1 E_3 (C_1 D_1 E_2) D_1 E_3*			
Anantapur														
Kalyandurg	36	26	15	3	10	6	89	40	0·1	1	—	—	3	230
	(15)	(11)	(6·6)	(1)	(4·5)	(3)	(39)	(18)	(0·1)	(1)	(—)	(—)	(1)	
Rayadurg	26	16	13	5	9	7	39	27	0·1	1	—	—	1	145
	(18)	(11)	(9)	(3·6)	(6·5)	(4·5)	(27)	(19)	(0·1)	(—)	(0·6)	(—)	(0·5)	
Uravakonda	15	8	8	0·2	6	4	19	15	0·1	—	1	—	1	78
	(20)	(10)	(10)	(0·3)	(8)	(5)	(24)	(20)	(0·1)	(—)	(1)	(—)	(1)	
	Rainfall Zone—XXIII			..		..		..			*Rainfall Pattern—D_1 E_3 (C_1 D_2 E_1) C_1 D_1 E_2*			
Anantapur														
Kadiri	46	42	30	1	16	10	120	75	0·1	—	0·2	—	4	346
	(13)	(12)	(9)	(0·3)	(4·6)	(2·9)	(35)	(21)	(0·1)	(—)	(0·6)	(—)	(1)	
Hindupur	28	20	14	1	11	6	74	25	0·1	—	2	—	3	183
	(15)	(11)	(8)	(0·4)	(6)	(3)	(40)	(14)	(0·1)	(—)	(1)	(—	(2)	
Penukonda	26	28	13	1	8	5	83	23	—	—	1	—	2	192
	(14)	(15)	(7)	(1)	(4)	(3)	(43)	(12)	(—)	(—)	(1)	(—)	(1)	
Dharmavaram	31	19	13	1	7	5	120	34	0·2	—	2	—	1	233
	(13)	(8)	(6)	(1)	(3)	(2)	(50·5)	(14)	(0·1)	(—)	(1)	(—)	(0·4)	
Anantapur	40	26	20	4	13	8	132	45	0·2	—	2	—	1	292
	(13·7)	(8·7)	(7)	(1)	(4)	(2·7)	(45)	(16)	(0·1)	(—)	(1)	(—)	(1)	
Madakasiro	26	17	11	2	10	6	75	28	—	—	1	—	3	179
	(14)	(10)	(6·5)	(1)	(6)	(3·5)	(42)	(15)	(—)	(—)	(1)	(—)	(2)	
	Rainfall Zone—XXIV			..		..		..		..	*Rainfall Pattern —(D_1 E_3 (C_1 D_3) C_2 E_2*			
Chittoor														
Madinapalle	44	45	34	1	9	6	97	63	—	—	1	—	6	304
	(14)	(14)	(11)	(0·2)	(3)	(2)	(32)	(21)	(—)	(—)	(0·4)	(—)	(2)	
Vayalpad	49	52	32	1	10	6	84	50	—	—	0·5	—	5	289
	(17)	(18)	(11)	(1)	(4)	(2)	(29)	(16)	(—)	(—)	(0·2)	(—)	(2)	
Punganur	28	41	24	1	6	4	61	32	—	—	0·2	—	3	200
	(14)	(20)	(12)	(0·3)	(3)	(2)	(31)	(16)	(—)	(—)	(0·1)	(—)	(1)	
Palamner	21	36	18	1	4	2	45	21	—	—	0·1	—	1	148
	(14)	(24)	(12)	(1)	(3)	(1)	(30)	(14)	(—)	(—)	(0·1)	(—)	(1)	
	Rainfall Zone—XXV			..		..		..		..	*Rainfall Pattern—D_1 E_3 (C_2 D_2) C_2 D_1 E_1*			
Bangarupalem	25	26	14	0·3	4	2	43	22	—	—	—	—	2	139
	(18)	(18)	(10)	(0·2)	(3)	(2)	(31)	(16)	(—)	(—)	(—)	(—)	(2)	
Ciltor	38	25	15	1	13	7	54	16	0·2	0·1	—	—	3	172
	(22)	(15)	(9)	(1)	(7)	(4)	(31)	(9)	(0·1)	(0·1)	(—)	(—)	(2)	
Chandragiri	30	27	17	2	12	6	40	23	—	—	0·4	—	2	157
	(19)	(17)	(11)	(1)	(7)	(4)	(26)	(14)	(—)	(—)	(0·3)	(—)	(1)	
Puttur	57	29	18	3	13	7	85	42	—	—	1	—	3	256
	(22)	(11)	(7)	(1)	(5)	(3)	(33)	(16)	(—)	(—)	(0·3)	(—)	(1)	
	Rainfall Zone—XXVI			..		..		..		..	*Rainfall Pattern—D_1 E_3 (C_4) C_1 D_1 E_2*			
East Godavari														
Pithapuram	11	6	4	3	13	9	3	7	0·1	—	—	—	2	57
	(19)	(10)	(7)	(5)	(22)	(15)	(5)	(12)	(0·2)	(—)	(—)	(—)	(4)	
Srikakulam														
Tekkali	24	27	32	29	14	21	29	15	8	—	—	—	2	205
	(12)	(13)	(16)	(14)	(7)	(10)	(14)	(8)	(4)	(—)	(—)	(—)	(0·4)	

Narsannapet	16 (12)	18 (14)	12 (9)	24 (18)	6 (4)	4 (3)	40 (30)	9 (7)	— (—)	— (—)	— (—)	— (—)	3 (3)	132
Pathapatnam	35 (20)	30 (17)	21 (12)	26 (15)	7 (4)	3 (2)	19 (11)	27 (15)	0·1 (0·1)	— (—)	— (—)	6 (3)	— (—)	174
Srikakulam	7 (6)	20 (17)	12 (10)	23 (20)	6 (5)	3 (3)	33 (28)	10 (9)	0·1 (0·1)	0·1 (0·1)	— (—)	— (—)	2 (2)	117
Ichchapuram	11 (29)	6 (17)	4 (9)	3 (8)	2 (7)	1 (3)	7 (18)	4 (9)	— (—)	— (—)	— (—)	— (—)	0·1 (1)	38
Sompeta	15 (21)	12 (17)	7 (9)	9 (12)	4 (6)	2 (3)	14 (18)	9 (12)	1 (1)	— (—)	0·2 (0·3)	— (—)	1 (1)	74
East Godavari														
Rajahmundry	33 (26)	23 (18)	19 (15)	3 (3)	14 (11)	9 (7)	9 (7)	11 (9)	1 (0·4)	— (—)	— (—)	— (—)	5 (4)	127
Peddapuram	25 (24)	17 (17)	12 (12)	3 (2)	14 (14)	8 (8)	9 (9)	11 (10)	— (—)	— (—)	— (—)	— (—)	3 (3)	103
Visakhapatnam														
Vizianagaram	27 (18)	15 (10)	8 (5)	18 (12)	12 (8)	5 (4)	41 (26·5)	22 (14)	0·1 (0·1)	— (—)	— (—)	— (—)	4 (3)	152
Gajapathinagaram	n.a.													
Srikakulam														
Salur	45 (28)	25 (16)	15 (9)	19 (12)	6 (4)	4 (2)	19 (12)	25 (15)	— (—)	— (—)	— (—)	— (—)	5 (3)	162
Bobbili	42 (17)	18 (8)	11 (5)	27 (11)	17 (7)	10 (4)	66 (27)	40 (17)	0·3 (0·1)	0·2 (0·1)	— (—)	— (—)	10 (4)	241
Visakhapatnam														
Srungavarapukota	21 (13)	15 (9)	8 (5)	27 (17)	14 (9)	9 (6)	38 (23)	23 (14)	— (—)	— (—)	— (—)	— (—)	6 (4)	162
Bheemunipatnam	32 (19)	16 (10)	10 (6)	15 (9)	13 (8)	14 (9)	37 (22)	22 (13)	— (—)	— (—)	— (—)	— (—)	6 (4)	165
Srikakulam														
Cheepurupalle	42 (15)	34 (12)	22 (8)	17 (6)	16 (5)	11 (4)	98 (33)	41 (14)	— (—)	— (—)	— (—)	— (—)	8 (3)	289
Visakhapatnam														
Visakhapatnam	10 (17)	5 (8)	2 (4)	6 (9)	8 (12)	3 (5)	14 (22)	13 (22)	— (—)	— (—)	— (—)	— (—)	2	61
Anakapalle	25 (15)	7 (4)	4 (2)	14 (8)	21 (13)	10 (6)	41 (25)	37 (23)	0·3 (0·2)	0·2 (0·1)	— (—)	— (—)	5 (3)	165
	Rainfall Zone—XXVII ..			..	..	..	..	..	..	..	*Rainfall Pattern—D_2 E_2 (B_1 C_3) C_1 D_1 E_2*			
Visakhapatnam														
Narasipatnam	45 (19)	19 (8)	16 (7)	20 (9)	23 (10)	15 (7)	45 (19)	35 (15)	0·2 (0·1)	— (—)	0·2 (0·1)	— (—)	14 (6)	231
Chintapalle	12 (34)	8 (22)	7 (21)	1 (3)	0·3 (1)	0·1 (1)	1 (2)	4 (13)	0·1 (1)	— (—)	— (—)	— (—)	1 (2)	35
	Rainfall Zone—XXVIII			..	..	..	..	..	..	..	*Rainfall Pattern—D_2 E_2 (B_3 C_1) C_1 D_1 E_2*			
Srikakulam														
Parvatipuram	25 (21)	16 (13)	13 (10)	17 (14)	5 (4)	4 (3)	21 (17)	17 (17)	— (—)	— (—)	— (—)	— (—)	5 (5)	124

APPENDIX 2 (*Concld.*)

(thousands)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Rainfall Zone—XXVIII (Contd.) ..			..	..	..	..	..	..	..	*Rainfall Pattern—D_2 E_2 (B_3 C_1) C_1 D_1 E_2*			
Palakonda	27	30	18	35	8	6	44	21	—	—	—	—	7	197
	(14)	(15)	(9)	(18)	(4)	(3)	(22)	(11)	(—)	(—)	(—)	(—)	(4)	
East Godavari														
Yellavaram	22	17	14	1	1	1	1	16	—	—	—	—	1	74
	(30)	(21)	(18)	(1)	(2)	(1)	(2)	(22)	(—)	(—)	(—)	(—)	(2)	
Ramapachodavaram	16	13	11	0·2	1	1	1	13	—	—	—	—	1	55
	(28)	(23)	(19)	(1)	(2)	(1)	(2)	(23)	(—)	(—)	(—)	(—)	(2)	
	Rainfall Zone—Special I			..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (A_1 B_1 C_2) C_1 D_1 E_2*			
Visakhapatnam														
Paderu	25·5	19	5	10·5	2	0·3	6	13·5	0·3	—	0·2	—	3	85
	(30)	(22)	(6)	(12)	(2)	(0·4)	(7)	(16)	(0·4)	(—)	(0·3)	(—)	(3)	
	Rainfall Pattern—Special II			..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (A_2 B_2) D_1 E_3*			
Khammam														
Migur	19	21	9	1	2	3	2	4	—	—	—	—	1	61
	(31)	(34)	(15)	(2)	(3)	(4)	(3)	(6)	(—)	(—)	(—)	(—)	(1)	
	Rainfall Pattern —Special III			..	..	..	..	..	..	..	*Rainfall Pattern—D_1 E_3 (C_2 D_2) C_1 D_1 E_2*			
Chittoor														
Kuppam	12	29	17	—	1	1	38	19	—	—	0·2	—	1	118
	(10)	(25)	(14)	(—)	(1)	(1)	(32)	(16)	(—)	(—)	(0·1)	(—)	(1)	

APPENDIX 3

Rainfall and Cropping Patterns

ANDHRA PRADESH

Cropping patterns	District	Taluk	Area in sq. km.	Elevation (masl) max.	Elevation (masl) min.	Annual total rainfall (cm)	Annual number of rainy days	Month of maximum rainfall	Rainfall in two consecutive months including the month of maximum plus the preceding or succeeding month whichever is higher: cm	Rainfall in two consecutive months including the month of maximum plus the preceding or succeeding month whichever is higher: no. of rainy days	Consecutive months* (a)	Consecutive months* (b)	Consecutive months* (c)
1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Rainfall Zone—I										*Rainfall Pattern—$E_4(D_3E_1)B_2C_1E_1$*		
Pd_1	Nellore	Nellore	1305	140	41	106	45	11	58	18	9—3	69	23
Pd_2Jr_4/B_4		Gudur	1199	158	52	104	49	11	53	18	10—3	64	22
		Venkata Giri	1106	1105	89	106	48	11	52	18	10—3	64	22
$Pd_3Jr_4Pu_4/Mt_4$		Atmakur	1655	554	166	80	41	11	41	16	10—2	41	16
$Jr_3Pu_4Pd_4$		Rapur	1539	357	140	100	48	11	49	18	10—3	60	22
	Rainfall Zone—II										*Rainfall Pattern—$E_4(C_1D_2E_1)C_2E_2$*		
$Jk_4Mt_4B_4O_4/Pu_4$	Ongole	Podili	1107	638	SL	66	37	10	27	12	9—3	38	18
		Kanigiri	2590	437	103	73	42	10	40	13	9—3	42	20
		Darsi	1530	300	146	63	37	10	24	13	9—2	24	13
$Mt_3B_4Pd_4JK_4/Gn_4$		Markapur	3537	868	150	65	43	10	24	13	9—3	35	19
$Mt_4B_4Pd_4Jk_4Ch_4$	Guntur	Vinukonda	1668	567	92	69	42	9—10	26	14	9—2	26	14
	Rainfall Zone —III										*Rainfall Pattern—E_4 $(C_1D_2E_1)$ $B_1C_1E_2$*		
$Jr_4Mt_4Pd_4$ To_4F_4/B_4R_4	Ongole	Kandukur	2023	173	SL	85	42	10	43	15	9—3	55	21
$To_4Mt_4Jr_4F_4/Pd_4B_4$		Ongole	1396	638	SL	94	47	10	41	17	9—3	59	23
	Rainfall Zone—IV										*Rainfall Pattern—$E_4(C_1D_2E_1)B_2E_2$*		
Pd_1	Nellore	Kovur	997	70	SL	108	n.a.	11	65	n.a.	8—4	93	n.a.
$Pd_3Jr_4Mt_4/Pu_4$		Kavali	1471	173	SL	99	42	10	55	17	9—3	66	23
$Jr_4Mt_4Pd_4B_4R_4$		Udayagiri	2256	844	184	92	45	11	43	16	9—3	53	22
	Rainfall Zone—V										*Rainfall Pattern—$E_4(C_1D_3)$ D_1 E_3*		
Gn_3 JK_4Mt_4/Pd_4	Anantapur	Gooty	1251	639	300	56	36	9	24	13	—	—	—
		Tadpatri	1660	623	300	55	36	9	22	13	—	—	—
$Gn_4Mt_4C_4JK_4/Jr_4$	Kurnool	Pattikonda	1936	548	450	60	40	9	25	15	—	—	—
$Gn_3JK_4Mt_4/Pd_4$		Dhone	2167	586	300	57	39	9	23	15	—	—	—
	Rainfall Zone—VI										*Rainfall Pattern—$E_4(C_1D_3)D_2E$*		
$Gn_3JK_4Mt_4$.	Cuddapah	Pulivendla	1474	449	300	56	38	9	22	13	—	—	—
$Jk_3Mt_4Gn_4Pd_5$		Jammala Amadugu	1588	300	169	60	39	9	24	15	—	—	—

* = Consecutive months with rainfall of more than 10 cm per month.

a = Initial month with more than 10 cm of rain fall and number of consecutive months with more than 10 cm per 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'

masl = metres above sea level.

NOTES : 1. Information on rainfall and rainy days based on Memoirs of India Meteorological Department, Vol. XXXI Part III.

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

APPENDIX 3 (*Contd.*)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Rainfall Zone—VII ..			..			..		..	*Rainfall Pattern—$E_4(C_1D_3)$ C_2E_2*			
$Pd_3B_4Fr_4R_4$	Cuddapah	Rajampet	2688	1047	142	77	47	10—11	29	15	9—3	41	22
Gn_2Pd_4		RayaChoti	2857	580	300	67	44	9	24	14	9—3	34	19
	Rainfall Zone—VIII ..			..			..		..	*Rainfall Pattern—E_4 $(C_1D_3)A_1B_1C_1E_1$*			
Pd_1	Nellore	Sullurpet	1484	35	SL	116	48	11	61	19	9—4	84	28
Pd_2Gn_4	Chittoor	Srikalahasti	1579	679	150	114	53	11	56	18	9—4	79	29
		Satyavedu	1003	858	150				na				
	Rainfall Zone—IX ..			..			..		..	*Rainfall Pattern—E_4 $(C_2D_2)D_2E_2$*			
$Pd_3Gn_4JK_4Mt_5$	Cuddapah	Cuddapah	1321	230	150	75	45	9	28	15	7—4	49	29
$Gn_3Pd_4JK_4$		Proddatur	1131	674	150	62	40	9	25	14	8—3	35	20
$Gn_3JK_4Mt_4$.		Kamalapuram	785	154	150	61	40	9	25	14	8—2	25	14
	Rainfall Zone—X ..			..			..		..	*Rainfall Pattern—E_4 $(C_2D_2)C_2E_2$*			
$Pd_3Mt_4Pu_4R_4$	Cuddapah	Badvel	1961	842	150	70	46	11—10	24	14	8—4	47	27
$Pd_3B_4Ffr_4R_4$		Sidhout	1575	893	137	81	49	9	29	16	7—5	63	37
	Rainfall Zone—XI ..			..			..		..	*Rainfall Pattern—E_4 (C_3D_1) D_1E_3*			
Pd_2B_4	Nalgonda	Miryalguda	1950	351	150	75	n.a.	9	33	n.a.	6—5	70	n.a.
$Pd_3Jk_4O_4$ V_4F_4	Hyderabad	Hyderabad (urban)	284	635	600	77	50	9	30	19	6—4	57	37
		Hyderabad (East)	665	600	450								
$Pd_4Jk_4Jr_4O_4Pu_4/B_4$	Nalgonda	Ramannapet	1772	523	450	67	n.a.	9	29	n.a.	6—4	53	n.a.
		Nalgonda	2470	450	300	66	47	9	30	17	6—5	64	39
$Pd_4Jk_4Gn_4Mt_4/Jr_4$	Kurnool	Nandyal	1721	902	206	77	47	9	32	18	6—4	57	34
		Allagadda	1571	912	150	69	46	9	31	18	7—3	43	27
$Jk_3Pd_4O_4Pu_4/B_4$	Nalgonda	Bhongir	1591	635	450	68	49	9	26	18	6—4	49	35
	Warangal	Jangaon	2395	621	300	81	n.a.	7	30	n.a.	6—4	65	n.a.
$Jk_3Mt_4Gn_4Pd_5$ C_4 Jr_4	Kunool	Koilkuntla	1461	450	202	59	39	9	25	15	8—2	25	15
		Banganapalle	686	300	210	68	n.a.	9	31	n.a.	8—2	31	n.a.
$Jk_3Gn_4O_4$	Mahbub Nagar	Achampet	2917	846	300	74	n.a.	7	32	n.a.	7—3	53	n.a.
$Jk_4Gn_4B_4Pu_4$		Gadwal	1341	600	300	75	n.a.	9	37	n.a.	7—3	53	n.a.
$Jk_3Gn_4Mt_4Pd_4$ R_4		Nagar Kurnool	1454	600	450	63	44	9	27	18	7—3	39	29
$Jk_3Gn_4Pd_4Mt_4$		Mahbub Nagar	1192	554	450	79	51	9	33	20	6—4	62	40
		Wanaparthi	1388	639	450	59	n.a.	9	26	n.a.	7—3	38	n.a.
		Atmakur	1157	450	300	76	n.a.	9	35	n.a.	6—4	61	n.a.
Jk_4 Pu_4 $R_4O_4Pd_4$		Shadnagar	1263	616	600	79	n.a.	9	36	n.a.	7—3	54	n.a.
$Jk_4Pd_4Jr_4O_4R_4/Pu_4$	Hyderabad	Hyderabad (West)	520	600	567	77	50	9	30	19	6—4	57	37
Jk_4 Jr_4 O_4 V_4		Chevella	962	600	567	60	n.a.	9	30	n.a.	7—3	41	n.a.
$Jr_3Gn_4Pd_4/Mt_4$	Kurnool	Kurnool	1659	454	450	61	43	9	25	17	7—3	36	26
		Nandikotkur	957	450	250	67	46	9	27	18	7—3	40	28
		Atmakur	1872	868	244	77	49	9	31	18	6—4	58	36
$Jr_3Mt_4Gn_4Jk_4$	Mahbubnagar	Makhtal	1379	711	349	64	n.a.	8	32	n.a.	7—3	45	n.a.
$Jr_3Pd_4Gn_4Pu_4$	Nalgonda	Huzurnagar	1710	250	80	83	n.a.	7	32	n.a.	6—5	77	n.a.
		Suryapet	2028	502	101	70	45	9	28	17	7—4	52	32
$Jr_4Pu_4O_4T_4$	Hyderabad	Tandur	961	581	450	76	53	9	34	21	6—4	63	42
$Gn_4Mt_4Jk_4Jr_4/Pu_4$	Mahbubnagar	Kollapur	1712	600	300	78	n.a.	8	39	n.a.	6—4	70	n.a.
		Alampur	1127	635	300	72	n.a.	8	35	n.a.	7—3	51	n.a.
$O_3Jk_4B_4$	Mahbubnagar	Kalvakurthi	2349	506	450	67	n.a.	9	31	n.a.	7—3	47	n.a.
	Hyderabad	Ibrahim-Patnam	1359	706	450	57	n.a.	7	23	n.a.	7—3	34	
	Nalgonda	Devarakonda	2702	450	300	66	47	9	30	17	6—5	64	39

$C_3Mt_4Jr_4/Gn_4Jk_4$	Kurnool	Alur	1589	954	450	59	39	9	24	14	—	—	—
		Adoni	1982	626	450	66	43	9	28	17	7—3	38	25
$Pu_4Jk_4Jr_4$ Mt_4G_4	Mahbubnagar	Kodangal	1194	501	450	78	n.a.	7	39	na	6—4	57	n.a.
$M_3Pd_4Jk_4$	Hyderabad	Medchal	767	635	600	82	41	7	34	19	6—4	65	33
$Mt_3B_4Pd_4Jk_4/Gn_4$	Ongole	Giddalur	2714	868	300	69	49	9	22	16	7—4	46	32
	Rainfall Zone—XII	..			—		..		..	*Rainfall Pattern—E_4 (C_3D_1) $C_1D_1E_2$*			
$Pd_4CA_4Jr_4Pu_4Gn_4Mt_4$	Guntur	Sattenapalle	1795	480	150	80	50	7	27	19	7—4	52	3
$Pd_4To_4Jr_4Fr_4/Mt_4$		Narasaraopet	1200	511	150	75	49	9—10	25	15	7—4	49	32
$Mr_4B_4Pd_4Jk_4Ch_4/Jr_4$		Palnad	2691	300	150	70	n.a.	9	26	na	7—4	49	n.a.
	Rainfall Zone—XIII	..			—		..		..	*Rainfall Pattern—E_4 (C_3D_1) C_1E_2*			
Pd_1	Guntur	Repalle	791	10	SL	97	52	9	31	18	7—5	78	41
Pd_2Pu_4		Bapatla	875	10	SL	90	49	10—9	34	16	7—5	73	19
$Pd_4To_4Jr_4F_4Mt_4$	Ongole	Chirala	869	202	SL				na				
$To_4Mt_4Jr_4F_4/Pd_4B_4$		Addanki	1383	308	150	77	41	10—9	30	14	8—4	52	2
	Rainfall Zone—XIV	..			..		..		..	*Rainfall Pattern—E_4 (C_4) $C_1D_1E_2$*			
Pd_1	Krishna	Gudivada	595	13	3	97	53	7	35	21	6—5	77	44
		Kaikalur	731	10	3	94	52	7	35	21	6—5	78	43
		Gannavaram	765	100	8	94	53	7	37	22	6—5	76	43
Pd_4 Pu_4	Guntur	Tenali	846	10	SL	95	54	7—8	34	21	6—5	75	44
$Pd_3Pu_4Gn_4Jr_4/Fr_4$	Krishna	Vijayawada	1129	386	8	96	52	7	38	22	6—5	78	43
$Pd_4Ch_4Jr_4Pu_4To_4$	Guntur	Guntur	1163	258	150	90	53	7—8	30	20	6—5	70	42
$Jr_3Pu_4Pd_4/Gn_4$	Krishna	Jaggayyapet	1386	150	10	80	47	7	30	19	6—5	67	39
		Nandigama	1019	300	8	83	49	7—8	32	20	6—5	70	41
	Rainfall Zone—XV	..			..		..		..	*Rainfall Pattern—E_4 (C_4) $B_1C_1E_2$*			
Pd_2O_4	East Godavari	Kothapeta	298	7	6	115	56	10	40	18	6—6	105	44
Pd_1		Alamuru	283	7	SL	114	54	7	41	22	6—6	104	49
		Kakinada	995	7	SL	110	58	10	39	18	6—6	99	51
		Ramchandra Puram	465	7	SL	111	57	10	38	17	6—6	100	55
		Mummidivaram	350	6	SL	130	55	10	49	18	6—6	120	50
		Razole	456	6	SL	119	57	10	44	18	6—6	111	52
		Amlapuram	562	6	SL	123	58	10	47	19	6—6	113	53
	West Godavari	Narsapur	722	6	SL	112	57	10	41	18	6—6	104	53
	Krishna	Bandar	966	3	SL	107	56	10	40	18	7—5	86	44
		Divi	1204	3	SL	103	na	10	38	na	7—4	84	n.a.
	Rainfall Zone—XVI	..			..		..		..	*Rainfall Pattern—E_4 (B_1C_3) D_1E_3*			
$Pd_3M_4S_4/Jr_4$	Medak	Narsapur	1078	664	600	98	na	7	56	na	7—3	82	n.a
		Medak	1201	635	469	95	57	7	46	27	6—4	80	46
$Pd_4Pu_4/M_4Jr_4/Jk_4$	Warangal	Narasampet	2025	730	238	106	60	7	52	30	6—4	87	47
		Warangal	2099	450	300	92	na	7	40	na	6—4	73	n.a.
	Karimnagar	Huzurabad	1450	459	300	89	53	7	39	25	6—4	70	42
		Karimnagar	1865	300	150	88	52	7	39	24	6—4	71	42
		Sirsilla	1870	450	300	80	na	7	39	na	6—4	68	n.a
$Jr_4Pu_4Jk_4Pd_4/T_4$	Medak	Zahirabad	1252	631	600	109	na	9	46	na	6—4	84	n.a.
		Narayankhed	960	487	450	97	na	7	41	na	6—4	77	n.a.
$Jr_4Pd_4Pu_4M_4$	Karimnagar	Sultanabad	1830	540	150	95	44	7	49	24	6—4	78	37
$Jr_4Jk_4Pu_4O_4/Pd_4$	Medak	Sangareddy	1186	600	512	84	52	9	36	21	6—4	66	40
		Andole	1255	634	450	84	na	7	37	na	6—4	73	n.a.
$M_3Pd_4Pu_4$	Nizamabad	Kamareddy	1163	664	150	79	na	8	40	na	6—4	67	n.a.
$M_4Pd_4Jk_4O_4/R_4$	Medak	Gajwel	1172	635	600	94	na	9	46	na	7—3	71	n.a.
		Siddipet	1417	678	450	76	na	7	38	na	7—3	55	n.a.

APPENDIX 3—(*Contd.*)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Rainfall Zone—XV (Contd)		..		..		..		..	*Rainfall Pattern—E_4 (B_1C_3) C_1 D_1 E_3*			
$Pu_4M_4Jk_4Pd_4$	Karimnagar	Jagtial	1756	269	150	94	54	7	45	26	6—4	77	44
$Jk_4Pd_4Jr_4O_4R_4/Pu_4$	Hyderabad	Vicarabad	1235	703	600	88	n.a.	9	38	na	6—4	72	n.a.
$Jk_4Pu_4R_4Pd_4O_4/Mt_4$		Pargi	1010	616	600	95	n.a.	9	46	na	6—4	79	n.a.
$Jr_3Pu_4Pd_4/Jk_4/Gn_4$	Khammam	Khammam	1757	296	150	95	57	7	38	26	6—5	79	48
$Jr_4Pu_4Pd_4$	Warangal	Mahbubabad	1755	300	150	104	57	7	47	27	6—4	81	45
	Karimnagar	Manthani	2161	300	150	95	n.a.	7	48	n	6—4	80	n.a.
	Adilabad	Lakshettipet	1901	665	150	96	53	7	54	2.	6—4	82	44
$Jr_3C_4Pu_4O_4$		Asifabad	2160	642	210	100	57	7	49	26	6—4	83	45
	Rainfall Zone—XVII		..		..		..			*Rainfall Pattern—E_4 (B_1C_3) $C_1D_1E_2$*			
Pd_1	West Godavari	Eluru	1321	13	3	99	55	7	39	23	6—5	84	49
		Tadepalligudem	930	59	3	106	58	7	41	24	6—5	89	48
		Bheemavaram	751	10	3	101	54	7	38	23	6—5	84	46
Pd_2S_4		Tanuku	555	10	6	112	58	7	42	24	6—5	95	49
$Pd_3Pu_4Gn_4Fr_4$	Krishna	Nuzvid	868	150	13	101	57	7	40	24	6—5	83	47
$Pd_3Pu_4Fr_4S_4/O_4/To_5$	West Godavari	Polavaram	1421	417	150	119	63	7	47	26	6—5	98	51
		Chintalapudi	1083	150	13	107	57	7	48	26	6—5	91	48
		Kovvur	1012	173	21	106	60	7	40	25	6—5	87	49
	Rainfall Zone—XVIII		..		..		..		..	*Rainfall Pattern—E_4 (B_2C_2) D_1E_3*			
$Jr_3Pu_4Pd_4/Jk_4/Gn_4$	Khammam	Yellandu	3315	730	201	112	n.a.	7	62	na	6—4	99	n.a
		Bhoorgam Padu	2039	560	82	96	n.a.	7	54	na	6—4	83	n.a.
		Bhadrachalam	2408	512	87	115	64	7	56	29	6—4	91	49
		Kothagudem	2797	668	150	103	n.a.	7	48	na	6—5	93	n.a.
		Madhira	1877	689	150	102	n.a.	7	45	na	6—5	93	n.a.
$Pu_4M_4Jk_4Pd_4$	Karimnagar	Metpalli	953	300	269	95	n.a.	7	50	na	6—4	85	n.a.
$Pd_3M_4Pu_4/Jr_4$	Nizamabad	Armur	1963	306	150	99	53	7	55	27	6—4	85	45
$Jr_3Pu_4Pd_4$	Krishna	Tiruvur	1136	564	150	100	54	7	45	24	6—5	85	46
	Rainfall Zone—XIX		..		..		..		..	*Rainfall Pattern—E_4 (B_3C_1) D_1E_3*			
Pd_2M_4	Nizamabad	Nizamabad	1409	664	450	101	58	7	50	29	6—4	87	48
$Pd_3Jr_4Jk_4/S_4/Pu_4$		Banswada	1187	626	450	114	n.a.	8	63	na	6—4	101	n.a.
$Pd_3Jr_4Jk_4/S_4/Pu_4$		Yellareddy	943	600	450	110	n.a.	7	53	na	6—4	99	n.a
		Bodhan	796	450	329	109	59	9	53	23	6—4	92	49
$Jk_4Pu_4Jk_4Gn_4$		Madnur	601	475	450	87	n.a.	7	53	na	6—4	84	n.a.
	Rainfall Zone—XX		..		..		..		..	*Rainfall Pattern—E_4 ($A_1B_1C_2$)D_1E_3*			
Pd_2Jr_4	Warangal	Mulug	3202	430	150	104	59	7	52	29	6—4	87	48
$Pd_3M_4Pu_4$	Adilabad	Khanapur	811	450	300	105	n.a.	7	58	na	6—4	98	n.a.
$Pd_4Pu_4M_4Jr_4/Jk_4$	Warangal	Parkal	1360	515	150	211	n.a.	7	58	na	6—4	73	n.a
$Jk_3C_4O_4/Pu_4$	Adilabad	Adilabad	1504	626	254	107	58	7	55	28	6—4	92	47
		Boath	1437	450	300	97	n.a.	7	52	na	6—4	85	n.a
		Utnur	1881	450	300	125	n.a.	7	73	na	6—4	113	n.a.
$Jk_4C_4Pu_4Pd_4/O_5$		Mudhol	1043	469	450	99	n.a.	7	55	na	6—4	91	n.a.
		Nirmal	1467	396	300	103	60	7	54	29	6—4	88	48
	Rainfall Zone—XXI		..		..		..		..	*Rainfall Pattern—E_4($A_2B_1C_1$)D_1E_3*			
$Jr_3Pu_4O_4/Pd_4$	Adilabad	Sirpur	2216	450	150	109	n.a.	8	65	na	6—4	102	n.a·
		Chinnur	1784	300	150	125	n.a.	7	75	na	6—4	111	n.a.
	Rainfall Zone—XXII		..		..		..		..	*Rainfall Pattern— D_1E_3 ($C_1D_1E_2$) D_1E_3*			
Jk_4 $Mt_4Gn_4Pu_4/C_4$ Jr_4	Anantapur	Kalyandurg	2126	741	600	50	33	9	21	11	—	—	—
		Rayadurg	1766	1003	450	53	35	9	23	12	9—2	23	12
$Gn_4Mt_4C_4Jr_4$		Uravakonda	1070	954	450	51	33	9	23	12	—	—	—
	Rainfall Zone—XXIII		..		..		..		..	*Rainfall Pattern—D_1E_3 ($C_1D_2E_1$) $C_1D_1E_2$*			
Gn_2B_4	Anantapur	Kadiri	2997	882	395	62	40	9	24	14	9—2	24	14
Gn_3 Pd_4Pu_4		Hindupur	1114	859	600	59	39	9	24	13	9—2	24	13
Mt_4/R_4B_4		Penukonda	1766	941	450	60	38	9	24	13	9—2	24	13
		Dharmavaram	1906	707	450	53	33	9	21	12	—	—	—
		Anantapur	2398	560	300	58	33	9	25	12	9—2	25	12
$Mt_4Gn_4Pu_4R_4Jk_4$		Madakasira	1080	809	600	59	40	9—10	24	13	9—2	24	13

	Rainfall Zone—XXIV		..	..	..	..	..	..	..	*Rainfall*	*Pattern*	D_1E_3 (C_1D_3)	C_2E_2
$Gn_3Pd_4S_4/B_4/R_4$	Chittoor	Madanapalle	2172	1089	600	74	49	10—9	26	15	9—3	37	21
		Punganur	1724	1177	600	76	49	9—10	27	16	8—4	47	28
		Palamner	1061	885	600	85	53	10—9	30	17	8—4	52	31
Gn_2Pd_4		Vaijalpad	2051	1028	600	79	50	9—10	27	15	9—3	38	21
	Rainfall Zone—XXV		..	..	..	..	..	..	..	*Rainfall*	*Pattern—*D_1E_3 (C_2D_2)	$C_2D_1E_1$	
$Gn_3Pd_4S_4/B_4/R_4$	Chittoor	Bangarupalem	812	543	450				na				
		Chittoor	1011	300	150	93	53	9	31	17	8—4	58	31
		Chandragiri	1409	1151	600	84	49	11	31	15	8—4	53	28
		Puttur	1558	600	111	96	52	11	37	16	7—5	72	38
	Rainfall Zone—XXVI		..	..	..	..	..	..	..	*Rainfall*	*Pattern—*D_1E_3 (C_4)	$C_1D_1E_2$	
Pd_2Pu_4	East Godavari	Pithapuram	357	10	SL	100	53	10	35	16	6—5	81	43
$Pd_2Pu_4/R_4/Fb_4$	Srikakulam	Tekkali	705	437	SL	110	55	9	42	18	6—5	89	44
		Narsannapet	518	150	SL	104	49	9	40	16	6—5	85	40
		Pathapatnam	1199	1130	SL	101	n.a.	7	34	n.a.	6—5	90	n.a.
		Srikakulam	569	538	SL	94	49	9	36	15	6—5	75	39
$Pd_3R_4O_4$	Srikakulam	Ichchapuram	225	150	SL	116	55	9—10	42	16	6—6	101	46
		Sompeta	549	248	SL	112	55	9—10	40	16	6—5	87	43
$Pd_3Pu_4B_4O_4$	East Godavari	Tuni	474	n.a.	n.a.	96	53	9	36	17	6—5	76	42
		Prathipadug	583	n.a.	n.a.	100	53	10	35	16	6—5	81	43
	Visakhapatnam	Chodavaram	1539	n.a.	n.a.	103	54	9—10	40	17	6—5	80	41
		Yellamanchili	899	n.a.	n.a.	96	53	10	40	18	6—5	73	41
$Pd_3Pu_4Fr_4To_5$	East Godavari	Rajahmundry	979	n.a.	n.a.	106	58	7	39	23	6—5	88	48
		Peddepuram	976	n.a.	n.a.	103	56	7	36	23	6—5	83	46
$Pd_3Gn_4Fb_4/Pu_4$	Visakhapatnam	Vizianagaram	688	n.a.	n.a.	105	54	9	40	18	6—5	83	43
		Gajapathinagaram	642	n.a.	n.a.	104	58	9—10	39	18	6—5	81	46
		Srungavara pukota	1054	n.a.	n.a.	117	65	10—9	41	19	6—5	88	49
		Bheemunipatnam	873	n.a.	n.a.	95	47	10	38	15	6—6	82	41
	Srikakulam	Bobbili	853	n.a.	n.a.	111	64	9—8	39	23	6—5	86	50
$Pd_4Fb_4Gn_4B_4R_4$	Do.	Salur	1031	n.a.	n.a.	112	64	9—8	37	22	6—5	87	49
$B_3Pd_4R_4O_4$	Visakhapatnam	Visakhapatnam	508	n.a.	n.a.	95	50	10	38	17	6—6	83	43
		Anakapalle	787	n.a.	n.a.	98	53	9—10	38	17	6—5	75	42
$Gn_3Pd_4Fb_4B_4Pu_4$	Srikakulam	Cheepurupalle	1196	n.a.	n.a.	106	57	9	40	21	6—5	85	46
	Rainfall Zone—XXVII		..	..	..	..	..	..	..	*Rainfall*	*Pattern—*D_2E_2 $(B_1C_3)C_1$	D_1E_2	
$Pu_3Pd_4Mt_4$	Visakhapatnam	Narasapatnam	1336	813	150	113	68	9	40	21	6—5	85	51
$Pu_4Pd_4B_4O_4/Jk_4Gn_4/Mt_4/Jk_4$		Chintapalle	2383	1729	300	113	73	7	39	27	6—5	86	55
	Rainfall Zone—XXVIII		..	..	..	..	..	..	..	*Rainfall*	*Pattern—*D_2E_2 (B_3C_1)	$C_1D_1E_2$	
$Pd_2Pu_4/R_4/Fb_4$	Srikakulam	Parvathipuram	1528	1216	150	129	71	8	47	25	6—5	102	55
$Pd_3Gn_4/Fb_4/Pu_4$		Palakonda	1280	300	48	123	65	8	48	24	6—5	100	52
$Pu_4Pd_4B_4O_4/Jk_4$	East Godavari	Yellavaram	2202	1316	150	129	64	7	47	24	6—5	103	50
Gn_4/Mt_4Jk_4		Rampachodavaram	1839	826	150	111	57	10	38	17	6—6	100	51
	Rainfall Zone—Special-I		..	..	..	..	..	..	..	*Rainfall*	*Pattern—*E_4 $(A_1B_1C_{32})$	$C_1D_1E_2$	
$Pd_3R_4O_4$	Visakhapatnam	Paderu	3105	1680	1200	120	n.a.	7	58	n.a.	6—5	109	n.a.
	Rainfall Zone—Special-II		..	..	..	..	..	..	..	*Rainfall*	*Pattern—*E_4 (A_2B_2)	D_1E_3	
Pd_2Jr_4	Khammam	Nugur	1616	463	82	148	71	7	79	34	6—4	126	56
	Rainfall Zone —Special-III		..	..	..	..	..	..	..	*Rainfall*	*Pattern—*D_1E_3 (C_2D_2)	$C_1D_1E_2$	
$R_4Pd_4Mt_4Pu_4Gn_4$	Chittoor	Kuppam	756	789	450	75	48	9	27	15	8—3	37	21

APPENDIX 4

Area under Principal Crops (Percent of Gross Cropped Area)

ANDHRA PRADESH

District/taluk	Gross cropped area (000 ha)	Pd	Jk	Jr	B	M	R	W	Ba	Mt	G	T	Pu	S	Gn	O	C	L	F	Misc.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Rainfall Zone—I			..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E4 (D3 E1)*					B_2 C_1	E_1
Nellore																				
Nellore	63·9	86·5	—	2	0·4	—	0·4	—	—	0·2	—	—	2	0·1	2	0·3	—	0·3	2	3·8
Gudur	38·0	57·6	0·4	10	5	—	2	—	—	1	—	—	1	0·1	7	2	—	0·2	1	10·0
Venkatagiri	21·0	55·7	—	6	14	—	6	—	—	3	0·1	—	1	—	4	3	—	—	—	7·3
Atmakur																				
Rapur	62·3	32·4	—	30·3	5	—	3	—	—	5	0·1	0·4	11	0·1	4	1	—	—	3	4·4
	39·7	15·0	—	47·4	6	—	1	—	—	5	—	0·1	12	—	6	1	—	—	0·3	5·7
	Rainfall Zone—II			..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E4 (C1 D2 E1)*					C_2	E_2
Ongole																				
Podili	70·0	3	32	2	8	—	5	—	—	30	—	2		—	1	9	2	—	—	2·0
Kanigiri	74·9	8	26	8	15	—	11	—	—	14	—	1	10	—	0·3	4	1	—	0·1	2·0
Darsi	78·1	4	27·5	1	16	—	3	—	—	25	—	2	4	—	1	8	4	—	—	2·7
Markapur	77·3	7	10	4	8	—	5	—	—	43·4	0·2	3	7	0·4	1	5	2	—	1	2·2
Guntur																				
Vinukonda	76·1	11	15	10	22	—	0·2	—	—	23	0·1	3	3	—	2	4	3	—	2	2·2
	Rainfall Zone—III			..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E4 (C1 D2 E1)*					B_1 C_1	E_2
Ongole																				
Kandukur	107·6	18	5	20	5	—	1	—	—	8	—	0·8	4	0·7	2	3	—	—	9	24
Ongole	89·0	5	4	14	5	0·4	2	—	—	15	—	1	2	—	2	1	—	—	15	34
	Rainfall Zone—IV			..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E4 (C1 D2 E1)*					B_2	E_2
Nellore																				
Kovur	64·7	88·5	—	—	0·2	—	0·2	—	—	0·1	—	—	2	0·1	1	0·1	0·1	0·4	4	3·6
Kavali	46·5	50	0·3	16	2	—	2	—	—	7	—	0·3	6	—	2	1	—	—	4	9·7
Udayagiri	46·5	12	6	23	13	—	12	—	—	13	—	0·4	12	0·2	1	2	0·1	—	1	4·5
	Rainfall Zone—V			..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E4 (C1 D3)*				D_1	E_3
Anantapur																				
Gooty	72.0	6	15	2	6	—	—	—	—	31	0·4	3	2	—	29	1	3	—	—	2·1
Tadpatri	98·3	5	24	—	0·4	—	0·3	—	—	27	0·3	2	1	0·1	26	1	11	—	—	2·0
Kurnool																				
Pattikonda	143·7	2	11	6	8	—	—	0·1	—	25	0·3	2	3	—	27	1	13	—	—	1·8
Dhone	104·0	2	13	5	5	—	—	neg	—	30	0·4	4	4	—	33	1	1	—	0·1	1·8
	Rainfall Zone—VI			..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E4 (C1 D3)*				D_2	E_2
Cuddapah																				
Pulivendla	78·5	1	24	1	1	—	2	0·1	—	21	1	1	1	—	36	0·3	5	—	—	6·0
Jammalamadugu	67·6	5	39	4	0·1	—	2	0·1	—	17	1	1	3	1	20	1	2	—	—	3·2
Warangal																				
Jangaan	126·7	19	31	8	6	2	0·2	0·1	—	0·3	1	4	9	—	5	11	0·1	—	—	3
Mahbubnagar																				
Achampet	63·9	5	36	—	7	—	6	—	—	4	0·2	2	4	—	9	25	—	—	—	1·0
Gadwal	109·3	3	30	3	14	—	0·1	—	—	8	0·1	3	13	—	12	0·7	3	—	—	9·8
Nagarkurnool	92·3	8	32	—	0·4	—	10·5	—	—	14	0·4	1	9	—	16	7	—	—	—	2
Mahbubnagar	64·7	13	31	1	1	—	12	0·1	—	6	0·2	3	9	—	11	8	—	—	0·3	5

	Rainfall Zone—VII	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (C_1 D_3) C_2 E_2*							
Cuddapah																				
Rajampet	38·4	38	1	2	17	—	8	—	—	1	—	—	4	1	2	3	—	3	0·4	20·3
Rayachoti	85·3	14	2	0·3	13	—	2	—	—	1	—	1	2	0·1	60	0·3	0·2	—	—	3·5
	Rainfall Zone—VIII	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (C_1D_3) $A_1B_1C_1E_1$*							
Nellore																				
Sullurpet	32·0	71·4	—	1	3	—	4	—	—	1	—	—	0·4	0·1	10	0·3	—	—	—	8·2
Chittoor																				
Srikalahasti	48·6	61	0·1	1	7	—	6	—	0·1	1	—	—	1	0·1	21	1	—	—	—	1·3
Satyavedu	36·4	48	1	1	10	—	9	—	—	1	—	—	1	0·4	20	2	—	—	—	7·5
	Rainfall Zone—IX	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (C_2 D_2) D_2 E_2*							
Cuddapeh																				
Cuddapeh	48·2	30	15	6	3	—	4	0·1	—	6	—	0·1	2	1	20	1	2	—	0·1	9·8
Proddatus	63·1	24	22·5	2	1	—	3	0·1	—	7	0·1	1	1	1	25	1	7	—	0·1	4·9
Kamlapuram	46·9	6	28·5	—	—	—	3	—	—	11	—	1	1	0·1	45·5	—	1	—	—	3·3
	Rainfall Zone—X ..	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (C_2 D_2) C_2 E_2*							
Cuddapah																				
Badvel	35·2	29·5	2	9	6	—	11	—	—	17·5	—	0·4	11	2	5	2	—	—	1	3·2
Sidhout	15·4	25	1	5	23	—	15	—	—	2	—	—	5	1	3	5	—	—	—	13·0
	Rainfall Zone—XI	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (C_3 D_1) D_1 E_3*							
Nalgonda																				
Miryalguda	113·7	52	6	11	15	—	—	—	—	2	0·1	0·3	5	—	6	1	0·1	—	—	1·0
Ramannapet	91·5	19·6	17·5	9	18	—	—	—	—	0·2	0·4	1	6	—	5	21	—	—	—	3·0
Nalgonda	143·7	17	18	16	19	—	—	—	—	1	0·2	1	8	—	6	9	0·1	—	0·1	5·0
Bhongir	66·8	23	26	1	14	2	—	—	—	0·2	0·4	3	5	—	3	21	—	—	0·1	2·0
Huzurnagar	121·4	28	—	32	4	—	—	—	—	2	0·1	1	7	—	23	0·1	2	—	0·1	1·2
Suryapet	144·5	20	1	26	14	0·1	—	—	—	—	0·2	1	18	—	17	1	—	—	0·2	1·0
Devarkonda	141·6	9	18	1	25	—	—	—	—	2	0·3	3	1	—	0·2	36	—	—	—	4·0
Hyderabad																				
Hyderabad (U)	4·5	31	5	1	—	1	—	1	—	—	—	—	—	—	—	1	—	—	23	37
Hyderabad (E)	19·8	30	17	2	6	1	0·2	0·2	—	0·2	2	2	2	—	3	24	—	—	5	5
Hyderabad (W)	16·2	20	26	13	2	0·4	1	1	—	1	0·3	1	2	—	0·4	9	1	—	1	22
Chevella	61·1	4	27	17	1	—	3	1	1	4	3	2	4	—	1	14	—	—	1	19
Tandur	62·7	8	4	32	2	—	4	1	—	5	3	10	18	—	2	10	0·3	—	0·2	1
Ibrahimpatnam	63·9	15	27	0·3	8	—	2	1	—	0·3	0·3	2	3	—	0·4	37	—	—	0·1	2·4
Medchal	20·6	26	8	2	4	36	5	0·3	—	1	1	2	2	—	0·2	7	—	—	—	5
Kurnool																				
Nandyal	78·9	27	15	20	0·1	—	—	—	—	8	1	1	2	0·1	15	—	2	—	0·2	8·5
Allagadda	90·2	27·5	16	5	0·1	—	0·1	0·1	—	21	0·2	1	2	0·1	13	8	3	—	—	3·4
Koilkuntla	80·9	9	35	11	0·1	—	0·1	1	—	8	2	1	1	—	14	2	5	—	—	10·3
Banga Napalli	44·5	4	41	7	0·4	—	—	0·2	—	10	1	1	1	—	4	3	10	—	—	19·5
Kurnool	117·4	7	4	29	1	—	—	0·3	—	17	1	2	1	—	28	1	2	—	0·2	6·2
Nandikotkur	72·0	14	—	30	—	0·2	—	0·2	—	18	0·2	1	1	—	29	0·2	1	—	0·2	5·3
Atmakur	48·2	21	—	28	—	—	—	—	—	15	1	1	4	0·1	21	1	1	—	0·1	6·0
Alur	155·0	1	6	21	2	—	—	0·1	—	17	0·2	0·3	2	—	4	1	42	—	—	3·2
Adoni	167·9	8	12	6·5	4	—	0·1	0·1	—	19·5	0·1	1	2	0·1	16·5	1	28	—	1	1·0

Pd —paddy
Jk —jowar kharif
Jr —jowar rabi
B —bajra

M —maize
R —ragi
W —wheat
Ba —barley
Mt —millets

G —Gram
T —tur
Pu —other pulses
S —sugarcane
Gn —groundnut

O —other oilseeds
C —cotton
L —plantations
F —fodder
Misc. —miscellaneous crops

NOTE : The percentage figures have been rounded off individually and hence cross totals may not, in some cases, add upto 100.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Rainfall Zone—XI—(concld.) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (C_1 D_1) D_1 E_3*					
Wanaparthi	62·3	23	25	0·3	4	—	7	—	—	12	0·1	—	6	—	16	1	—	—	—	6·7
Atmakur	76·1	11	29	10	14	—	1	—	—	12	0·3	—	8	—	14	1	—	—	—	—
Shadnagar	72·8	11	21	2	3	—	16	1	—	4	1	3	10	0·1	2	19	—	—	0·2	7
Makhtol	90·2	6	9	35	5	—	1	—	—	15	0·4	2	7	—	15	2	2	—	0·1	—
Kolapur	85·0	8	17·5	5	0·5	—	8	—	—	19·5	—	2	13	—	22·5	1	—	—	0·3	1·8
Alampur	99·1	9	10·5	22·5	2	—	—	—	—	12	—	2	4	—	23·5	1	5	—	1	7
Kalvakurthi	125·5	6	29·6	0·3	10	—	2	—	—	1	—	3	3	—	1	42·5	—	—	0·1	1
Kodanagal	83·8	9	15·5	14	0·3	—	8	0·3	—	10	2	6	24·5	—	6	3	—	—	0·1	1
Ongole																				
Giddalur	65·6	9	7	3	12	—	3	0·1	—	37	1	1	6	0·4	9	1	1	—	—	9·8
	Rainfall Zone—XII —	..	..	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (C_3 D_1) C_1 D_1E_2*					
Guntur																				
Sattanapalli	125·5	26	8	7	3	0·1	—	—	—	11	1	1	7	—	12	1	1	—	2	19·2
Narasaraopet	83·4	29	5	21	2	0·1	—	—	—	8	0·4	1	4	—	4	1	2	—	3	18·8
Palnad	127·1	15	13	2	11	—	0·1	—	—	28	1	0·1	4	—	10	1	4	—	1	9·3
	Rainfall Zone—XIII ..	..	..	..	..	..	..	..	..	..	..	..	..		*Rainfall Pattern—E_4 (C_3 D_1) C_2 E_2*					
Guntur																				
Repalle	75·3	78	—	0·1	—	0·2	1	—	—	—	—	0·1	10	1	3	0·3	0·2	—	—	4·0
Bapatla	105·2	45·5	—	1	—	0·1	1	—	—	1	1	0·2	30·5	0·3	6	0·1	1	—	7	6·0
Ongole																				
Chirala	72·8	29	—	6	0·2	—	1	0·2	—	3	2	0·1	3	—	2	1	1	—	23	29
Addanki	89·8	11	5	18	9	0·1	0·1	—	—	10	0·4	1	2	—	4	1	0·4	—	9	28
	Rainfall Zone—XIV ..	..	..	..	..	..	..	..	..	..	..	..	..		*Rainfall Pattern—E_4 (C_4) C_1 D_1 E_2*					
Krishna																				
Gudivada	78·5	78	—	—	Neg	—	—	—	—	—	—	—	16	0·3	—	—	1	—	4	1·1
Kaikalur	79·7	99	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	0·1
Gannavaram	69·2	65	—	1	—	0·1	—	—	—	—	1	0·2	13·5	6	3	0·1	0·4	—	5	4·8
Vijayawada	76·5	38	0·1	12	1	1	1	—	—	—	2	1	16	6	11	0·3	0·3	—	4	8·5
Jaggayyapet	23·5	18	—	38	1	—	—	—	—	4	2	3	18	—	21	—	—	—	0·1	—
Nandigama	86·2	13	0·1	37	1	0·1	—	—	—	0·2	0·1	2	26	1	4	0·1	—	—	1	15·1
Guntur																				
Tenali	128·7	53·5	0·1	0·1	—	—	—	—	—	—	0·1	1	26	1	1	0·1	2	0·3	12	3·0
Guntur	153·4	20·5	2	7	2	0·4	—	0·1	—	2	3	1	16	1	3	2	1	0·3	5	34
	Rainfall Zone—XV ..	..	..	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (C_4) B_1 C_1 E_2*					
East Godavari																				
Alamuru	33·6	82	0·1	0·3	—	0·2	0·1	—	—	0·2	—	1	3	3	—	1	—	2	1	6·0
Kakinda	66·8	90	—	—	—	—	0·2	—	—	—	—	0·2	1	2	4	1	—	0·2	0·1	5·0
Ramchandrapuram	55·8	86	0·1	0·1	—	—	0·1	—	—	0·2	—	0·1	3	4	0·1	1	—	0·2	2	2·8
Razole	35·6	66	—	0·4	—	0·1	—	—	—	—	—	—	1	2	0·2	20	—	1	1	8·0
Mummidivaram	33·6	81	0·3	—	—	—	—	—	—	0·1	—	—	1	1	0·6	12	—	0·6	1	2
Amalapuram	45·7	71	0·3	0·2	—	—	—	—	—	0·2	—	—	1	1	0·3	18	—	7	1	—
Kothapeta	32·8	51	0·3	2	—	0·3	—	—	—	1	—	1	1	5	—	15	—	7	8	8·1
W. Godavari																				
Narsapur	74·5	81	—	0·2	—	—	0·4	—	—	—	—	—	0·1	6	1	5	—	0·5	1	5·0
Krishna																				
Bandar	53·8	95	—	—	—	—	—	—	—	—	—	—	0·1	—	3	1	—	3	0·2	—
Divi	89·0	73	—	2	—	0·2	—	—	—	—	—	0·2	12	3	1	1	1	—	7	2
	Rainfall Zone—XVI ..	..	..	..	..	..	..	..	..						*Rainfall Pattern—E_4 (B_1 C_3) D_1 E_3*					
Medak																				
Narsapur	35·6	37	8	25	—	9	4	1	—	—	1	1	3	4	1	4	—	—	0·3	3·0
Medak	49·4	47·5	1	6	—	20·5	7	—	—	2	1	0·3	3	8	1	2	—	—	0·1	1
Zahirabad	90·6	3	13	18	5	0·1	0·1	2	1	4	6	2	15	3	5	6	—	—	1	16

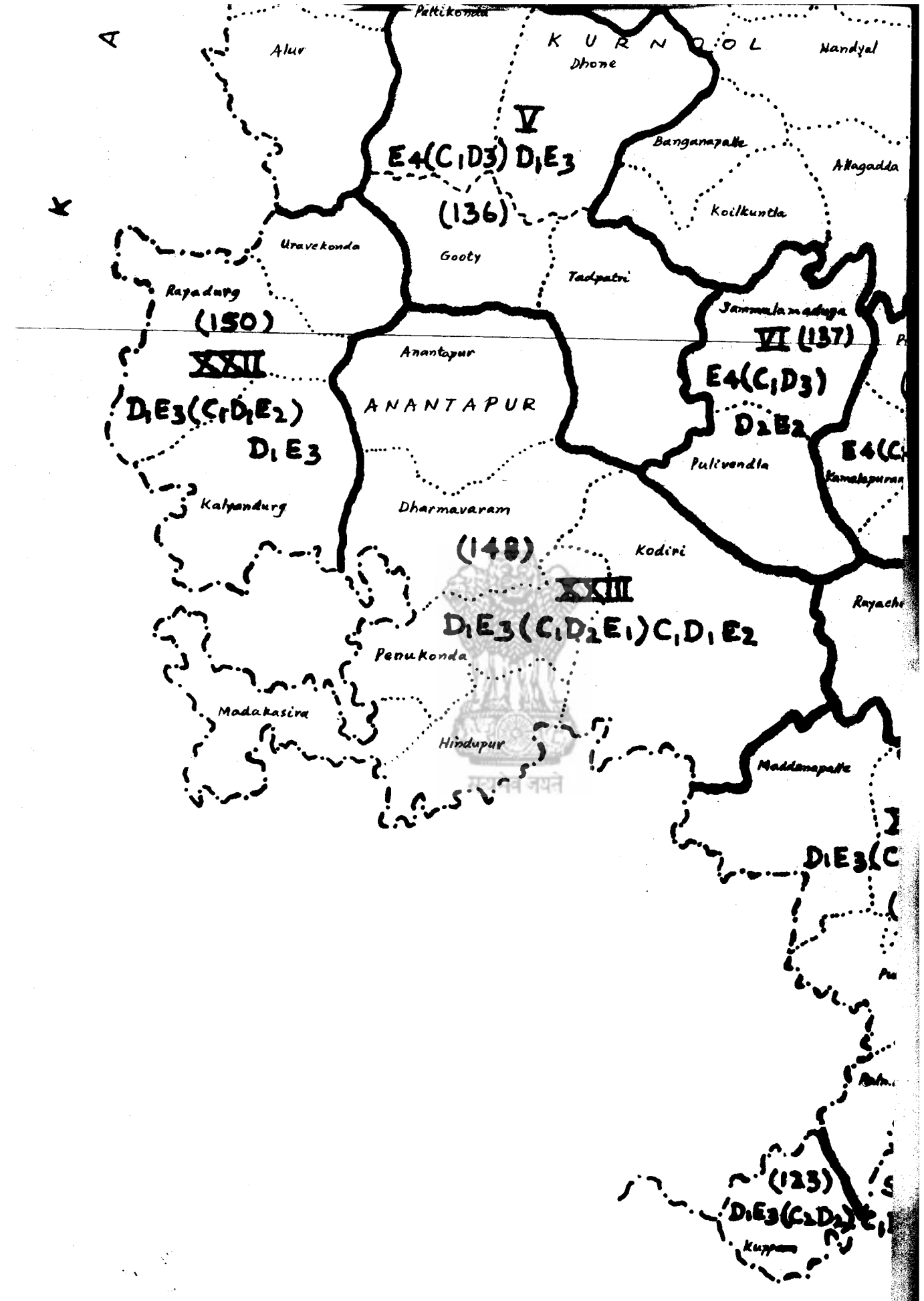
Narayankhed	51·8	10	28	17	0·1	—	0·2	1	Neg	2	5	3	21	0·2	1	6	1	—	—	5·0
Sangareddy	72·0	8	19	27	0·1	0·4	0·3	1	—	1	5	2	12	1	1	11	—	—	1	10
Andole	74·5	17	13	33	0·1	0·1	3	1	Neg	1	5	2	12	0·4	1	6	—	—	2	4
Gajwel	46·9	23	11	1	1	32	10	0·1	—	4	2	1	7	1	0·3	4	—	—	—	2·0
Siddipet	64·3	22	17	—	0·1	24·4	3·1	—	—	2	0·4	1	8	1	2	17	—	—	—	2
Warrangal																				
Narsampet	73·2	27	6	19	2	12	—	—	—	1	0·1	—	22	—	6	1	—	—	0·4	4
Warangal	151·8	24	18	13	2	8	—	0·1	—	0·1	0·2	3	16	—	11	2	0·1	0·1	0·2	1·6
Mahbubabad	131·9	19	1	37	5	2	—	—	—	—	—	1	22	—	9	1	—	—	0·2	2·2
Karimnagar																				
Huzurabad	73·7	25	17	1	—	18	—	0·2	—	—	1	1	14	—	16	2	—	—	—	5
Karimnagar	86·6	27·5	20·6	—	—	12	—	0·1	—	—	1	2	13	0·1	10	12	1	—	—	1·5
Sirsilla	76·9	26	19	0·2	—	18	0·1	0·1	—	0·1	2	—	15	0·4	2	14	2	—	—	0·4
Sultanabad	102·0	19	3	24	—	12	—	0·1	—	—	1	2	30	—	3	4	0·1	—	—	2
Jagtial	85·4	15	12	11	—	19·5	—	0·1	—	—	0·3	3	21·5	—	1	14	—	—	—	3
Manthani	44·5	22	0·1	38	—	6	—	0·3	—	—	1	—	17	—	0·3	8	—	—	—	8
Nizamabad																				
Kamareddy	51·8	22	3	5	—	31·5	4	0·3	—	3	4	0·2	15·5	4	1	3	—	—	—	2
Hyderabad																				
Vicarabad	72·4	3	25·5	9	1	—	1	0·3	2	8	4	2	13·5	—	4	12	0·2	—	3	12
Pargi	51·4	13	16	5	1	—	14·5	0·3	1	11	2	2	14·5	—	3	5	—	—	1	9
Khammam																				
Khammam	130·3	16	0·1	50	2	0·3	—	—	—	—	—	2	10	—	19	—	—	—	0·3	2·6
Adilabad																				
Lakshetipet	56·3	18	—	36	—	7	—	0·1	—	—	—	6	23	—	—	9	—	—	—	—
Asifabad	71·6	3	3	51	—	3	—	0·2	—	0·2	—	7	15	—	—	17	0·3	—	—	—
Rainfall Zone—XVII .. .. — .. .. *Rainfall Pattern—E_4 (B_1 C_3) C_1 D_1 E_2*																				
West Godavari																				
Eluru	83·4	78	1	0·2	0·3	—	0·3	—	—	0·1	—	1	5	0·4	2	2	—	1	—	9
Tadepalligudem	81·3	74	1	2·5	0·2	—	0·1	—	—	—	—	1	5	3	1	5·5	—	—	1	6
Bheemavaram	89·4	96	—	—	—	—	—	—	—	—	—	—	—	2	—	0·3	—	0·1	1	1
Tanuku	72·0	63	—	0·2	—	0·2	—	—	—	—	—	0·1	0·3	22	1	5	—	—	2	7
Polavaram	36·8	39	9	3	1	—	1	—	—	3	—	2	16	1	1	9	—	—	—	15
Chintalapudi	49·4	40	2	3	1	1	2	—	—	1	—	0·3	14	0·3	2	4	—	—	0·3	29
Kovvur	70·0	34	1	2	0·4	0·1	0·1	—	—	0·1	0·3	2	9	14	3	8	—	1	1	24
Krishna																				
Nuzvid	49·4	27	—	6	1	0·2	1	—	—	—	—	1	9	2	17	1	—	—	0·1	35
Rainfall Zone—XVIII .. .. *Rainfall Pattern—E_4 (B_2 C_2) D_1 E_3*																				
Khammam																				
Yellandu	78·5	17	3	43	2	2	—	—	—	2	0·1	2	19	—	3	4	—	—	1	2·4
Bhoorgampadu	38·4	27·5	3	35	0·1	2	—	—	—	1	1	1	12	—	2	3	—	—	1	12
Bhadrachalam	29·5	25	14	33	0·2	1	—	—	—	1	1	1	6	—	—	1	—	—	—	17
Kottagudam	65·6	17	3	32	0·3	2	—	—	—	3	0·1	2	25	—	1	8	—	—	1	6
Madhira	111·7	23	—	44	0·4	1	0·3	—	—	0·1	0·2	3	14	—	10	0·2	—	—	1	2·4
Karimnagar																				
Metpalle	57·5	16	19	—	—	19	—	0·1	—	—	0·3	0·3	21	—	3	14	1	—	—	6·5
Nizamabad																				
Armur	78·9	42	12·5	0·3	—	17	—	0·1	—	0·1	1	1	8	0·4	2	5	2	—	0·1	6
Krishna																				
Tiruvur	70·8	28	—	30	1	1	0·2	—	—	—	—	1	15	—	8	0·3	—	—	1	15

APPENDIX 4 (*Contd.*)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Rainfall Zone—XIX ..	..	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (B_3 C_1) D_1 E_3*						
Nizamabad																				
Nizamabad	50·6	55	5	5	—	12	—	0·4	—	1	1	1	6	6·5	2	3	—	—	0·1	2·4
Bodhan	47·3	46	2	15	—	0·3	—	1	—	—	3	1	5	18	3	3	—	—	0·3	2·4
Banswada	38·8	45	6·5	18·5	—	1	0·2	0·3	—	—	3	2	12	5	1	3	0·1	—	1	2
Yellareddy	33·6	38	5	17	—	8	3	0·4	—	1	6	0·3	13	2	0·3	4	—	—	0·3	1
Madnur	47·8	5	11·5	28·5	—	—	—	3	—	0·3	9	3	14·5	—	5·10	5·6	4	—	—	6
	Rainfall Zone—XX ..	..	..	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (A_1 B_1 C_2) D_1 E_3*						
Warangal																				
Mulug	42·5	57	1	18	—	4	—	—	—	1	0·4	—	10	—	0·4	1	3	—	1	3·5
Adilabad																				
Khanapur	21·9	35	9	4	—	18	—	—	—	0·2	1	0·2	16	—	—	13	.3	—	—	3
Warangal																				
Parkal	74·1	25	1	22	—	17	—	—	—	0·2	1	0·2	24	—	4	1	—	—	—	4·5
Adilabad																				
Adilabad	81·7	2	34·5	—	—	—	—	0·4	—	0·2	0·3	8	5	—	10	9	30	—	—	1
Boath	57·1	8	35	—	—	0·4	—	2	—	—	2	5	9	0·2	1	1	33	—	—	3·2
Utnur	57·5	9	34	0·2	0·4	2	—	1	—	0·2	1	6	13	0·1	2	5	24	—	—	1·5
Mudhol	74·5	5	30	3	—	0·1	—	2	—	0·1	1·6	6	9	—	2·7	6	25	—	0·1	20
Nirmal	62·3	19	27	—	—	6	—	1	—	0·1	1	6	11	0·3	3	7	12	—	3	4·1
	Rainfall Zone—XXI ..	..	..	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—E_4 (A_2 B_1 C_1) D_1 E_3*						
Adilabad																				
Sirpur	74·1	6	—	51	—	2	—	0·3	—	0·1	1	1	21	—	—	17	—	—	0·1	0·3
Chinnur	39·3	17·6	—	40	—	5	—	0·1	—	0·1	0·6	0·2	18·5	—	0·2	18	—	—	—	—
	Rainfall Zone—XXII ..	..	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—D_1 E_3 (C_1 D_1 E_2) D_1 E_3*						
Anantapur																				
Kalyandurg	88·2	4·6	26·7	1	9	—	2	—	—	14	—	3	13·7	—	15	6	·2	—	—	5
Rayadurg	109·7	11·6	14·6	13·6	6	—	1	·1	—	12	0·1	2	4	—	16	1	11	—	—	7
Uravakonda	80·9	1	4	18	4	—	·2	·1	—	20	1	2	1	—	21	1	10	—	—	17
	Rainfall Zone XXIII ..	..	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—D_1 E_3 (C_1 D_2 E_1) C_1 D_1 E_2*						
Anantapur																				
Kadiri	105·6	3	3	—	14·5	—	4	1	—	6·5	·1	2	8	.3	53·5	1	—	—	.2	2
Hindupur	50·2	7	6	1	14·5	1	12	.2	—	5	1	3	8	8	25	1	—	—	1	7
Penukonda	35·6	15	8	.5	6	.1	11	.2	—	8	.3	1	8	3	31·4	2	.3	—	.3	5·5
Dharmavaram	70·4	13	8	.1	3	—	4	.1	—	14	—	1	15·5	.1	31	6	.2	—	—	3·6
Anantapur	106·4	9	2	—	4	—	3	—	—	25	.2	4	9	—	27·5	2	1	—	—	13
Madakasira	43·7	10	10	2	.3	—	15	.1	—	27	—	2	13	1	14	1	.1	—	—	4·1
	Rainfall Zone XXIV ..	..	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—D_1 E_3 (C_1 D_3) C_2 E_2*						
Chittoor																				
Madanapalle	84·2	13	2	0·3	18	0·1	6	0·2	—	3	—	1	5	2	43·5	1	—	—	1	4·0
Vayalpad	78·1	18	1	0·3	10	—	2	—	—	1	—	0·3	1	1	61·5	1	—	—	—	2·0
Punganur	57·1	22	2	0·1	4	0·1	21	0·1	—	6	—	0·2	4	3	32	0·3	—	—	0·3	5
Palamner	38·8	15	6	—	0·1	—	25	—	—	6	—	1	7	3	32·5	1	—	—	—	3
	Rainfall Zone—XXV ..	..	..	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—D_1 E_3 (C_2 D_2) C_2 D_1 E_1*						
Bangarupalem	27·9	20	8	0·3	1	—	3	—	—	0·4	—	0·3	4	13	39	1	—	—	—	9·5
Chittor	36·1	23	4	1	3	—	7	—	—	1	—	1	4	13	32·5	2	—	—	—	8·5
Chandragiri	31·2	33	1	0·3	8	—	4	—	—	0·2	—	1	1	7	34	1	—	—	—	9
Puttur	94·5	31	1	0·3	10	—	1	—	—	1	—	0·4	1	3	31·5	2	—	—	—	7

	Rainfall Zone—XXVI ..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—*	D_1	E_3	(C_4)	C_1	D_1	E_2	
Srikakulam																		
Pithapuram	26·7	55	0·2	—	3	1	0·4	—	—	0·1	0·3	0·3	14·5	9	1	1	1	1	3	10
Tekkali	44·9	65	—	—	3	—	10·5	—	—	2	—	—	5	0·2	5	3	—	—	—	7
Narsannapet	46·9	54	0·1	1	1	—	7	—	—	3	—	—	14·5	1	10	2	—	—	—	6·8
Patbapalnam	59·1	10	0·1	—	—	—	9	—	—	1	—	—	10	1	5	3	—	—	—	11·5
Srikakulam	50·6	55·5	0·3	2	1	0·1	6	—	—	2	0·1	—	16	3	9	0·3	—	—	—	5
Ichchoparam	18·6	45	—	—	1	—	12·5	—	—	0·3	—	1	11	—	—	23	—	—	—	6
Tuni	33·2	39	—	4	13	—	5·5	—	—	1	7	2	8	33	4	9	0·4	—	—	10
Prathipadu	36·0	36·5	3	3	15	0·2	2	—	—	2	0·3	2	10	5	5	8	0·4	—	—	7
Sompeta	32·8	52	0·3	—	5	—	14	—	—	2	—	1	5	0·4	—	9	—	0·5	—	10·2
Chodavaram	62·7	35	5	1	10	—	4	—	—	3	—	1	11	12	12	4	—	—	—	2
Yellamanchili	68·8	33	0·2	7	18·5	0·1	8	—	—	0·3	—	2	11	6	2	6	—	0·2	—	5·5
Rajahmundry	63·5	46	0·1	1	2	0·1	2	—	—	0·2	0·1	1	6·5	5	1	7	—	1	3	26
Peddapuram	51·4	41	0·1	0·1	5	0·1	4	—	—	0·2	1	3	9	8	6	10	0·1	0·3	—	12
Vizianagram	41·7	41	—	—	1	0·1	4	—	—	1	—	0·1	6	1	20	5	—	—	—	21
Bajpatinagaram	30·4	40·5	1	—	3	—	7	—	—	3	—	—	5	1	14	2	—	—	—	24
Srungavrupukota	53·4	44	0·4	—	3	—	4	—	—	2	—	0·1	17	1	21	6	—	—	—	6·5
Bheemuuipatnam	50·2	24	—	1	14	—	9	—	—	1	—	0·1	10·5	0·2	29	3	—	—	—	8
Bobbili	59·9	44	0·3	0·2	0·1	—	3	—	—	1	—	—	2	5	9	1	—	—	—	34
Salur	37·6	25	5	0·1	10	0·1	10	—	—	9	—	—	5	3	13	2	—	—	—	17·6
Vasakhapatnam	16·6	13	0·2	—	31	—	17	—	—	1	—	0·3	10	0·4	5	10	—	—	—	16·0
Anekapalle	55·0	19	—	2	26	0·2	16	—	—	2	—	0·3	7	10·5	1	10	—	—	—	55
Cheepurapalli	89·4	23	—	2	5	—	6	—	—	0·3	—	0·2	2	0·2	34	2	—	—	—	25
	Rainfall Zone—XXVII..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—*	D_2	E_2	$(B_1$	$C_3)$	C_1	D_1	E_2	
Visakhapatnam																		
Narsapatnam	110·1	21·5	5	4	12	0·1	7	—	—	7	0·2	1	19·5	3	7	9	0·1	—	—	3·8
Chintapalle	15·4	18	6	2	—	6	4	0·2	—	13	—	1	40	—	1	7	—	—	—	2
	Rainfall Zone—XXVIII..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—*	D_2	E_2	$(B_3$	$C_1)C_1$	D_1	E_2		
Srikakulam																		
Parvathipuram	44·9	53·5	1	0·1	1	0·2	7	—	—	3	—	1	3	1	1	4	—	—	—	24·0
Pala Konda	91·5	46	0·3	1	0·2	0·2	6	—	—	1	—	0·2	16	3	9	1	—	—	—	16
East Godavari																		
Yellavaram	23·9	24	7	2	19	2	3	—	—	7	—	2	21	0·3	1	9	—	—	—	3
Rampachodovaram	17·0	14	16	1	11	3	6	—	—	6	0·4	2	18	0·4	1	7	—	—	—	14
	Rainfall Zone—Special-I	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—*	E_4	$(A_1$	B_1	$C_2)$	C_1	D_1	E_2	
Paderu	42·5	39	4	—	—	4	21	—	—	12	—	1	0·4	0·1	0·2	11	—	—	—	6·6
	Rainfall Zone—Special-II	..	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—*	E_4	$(A_2$	$B_2)$	D_1	E_3		
Nugur	21·0	64	1	15	—	2	—	—	—	1	—	0·4	4	—	—	1	—	—	1	10
	Rainfall Zone—Special-III	..	..	..	..	..	..	..	..	..	*Rainfall Pattern—*	D_1	E_3	$(C_2$	$D_2)$	C_1	D_1	E_2	
Kuppam	31·6	16	11	0·4	2	0·1	23	—	—	14	—	1	13	2	13	1	—	—	—	3·8


सत्यमेव जयते



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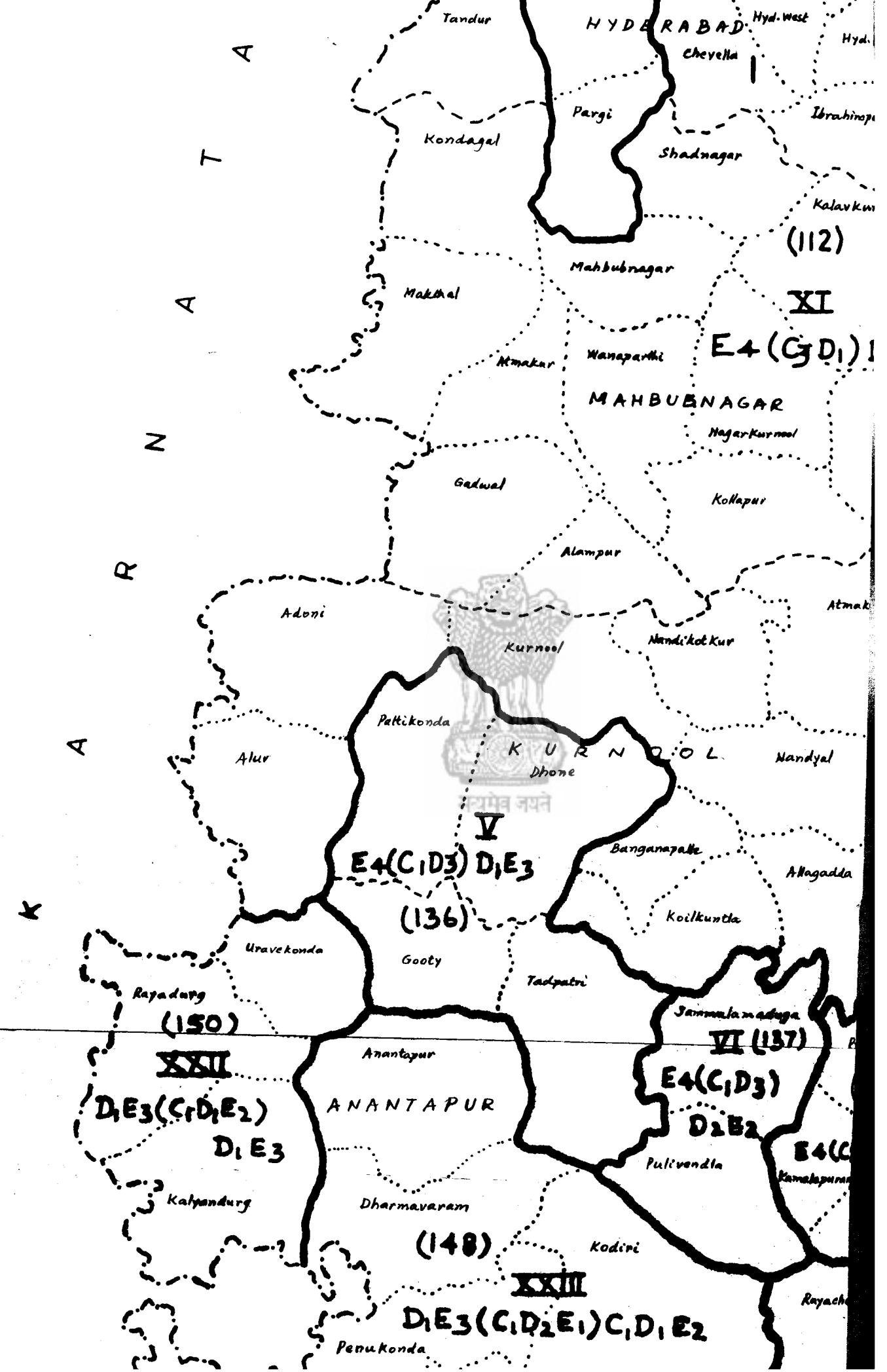
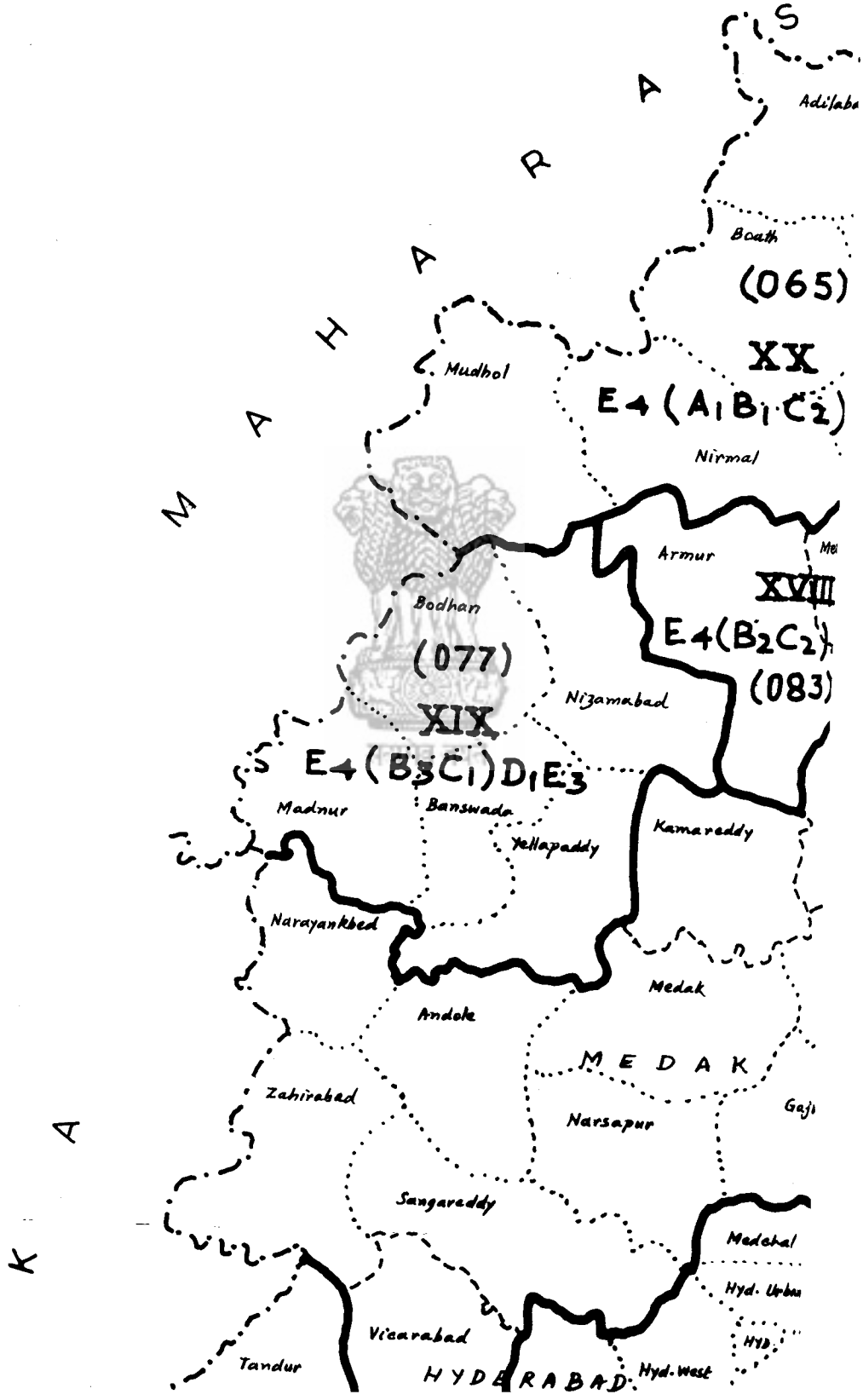
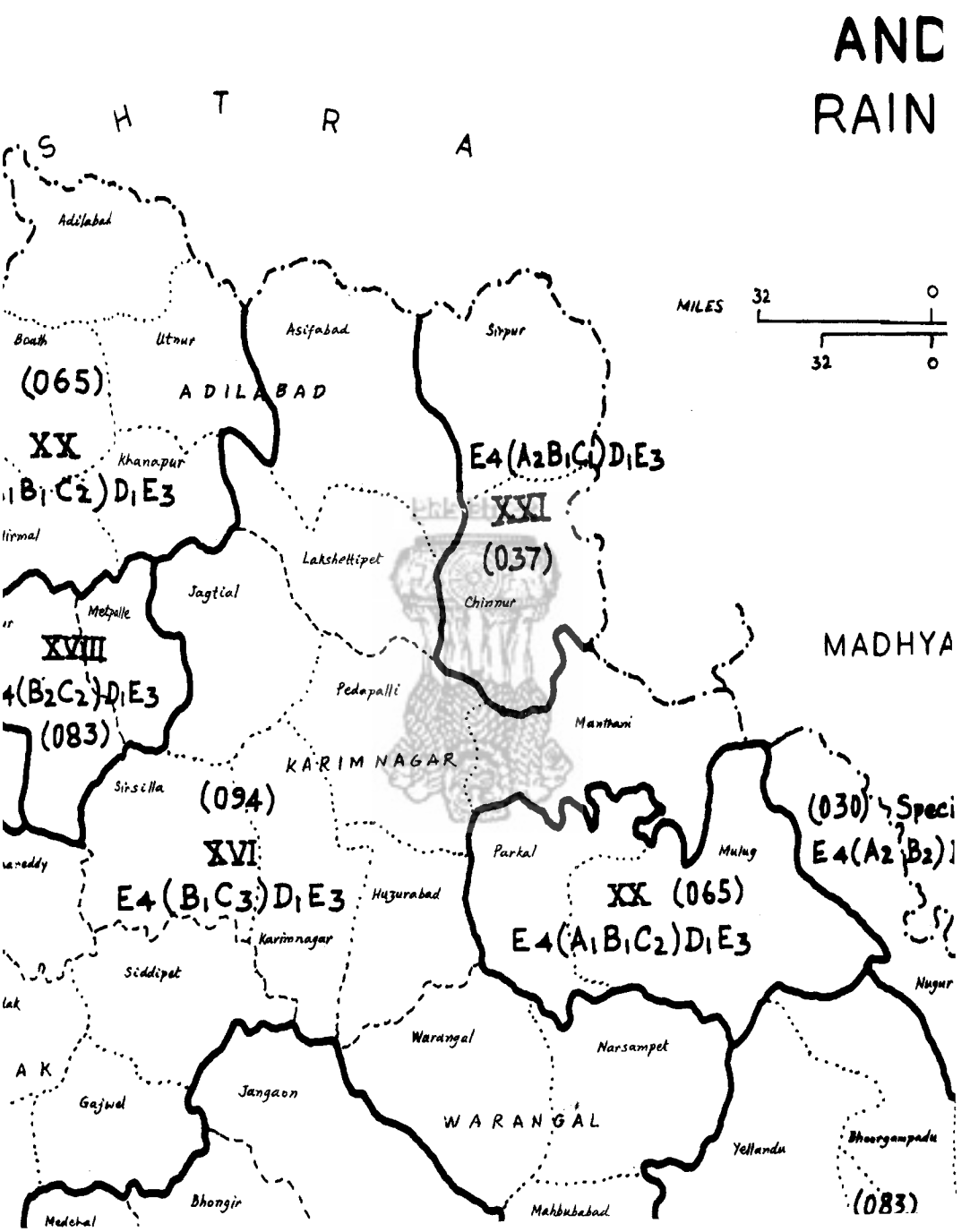
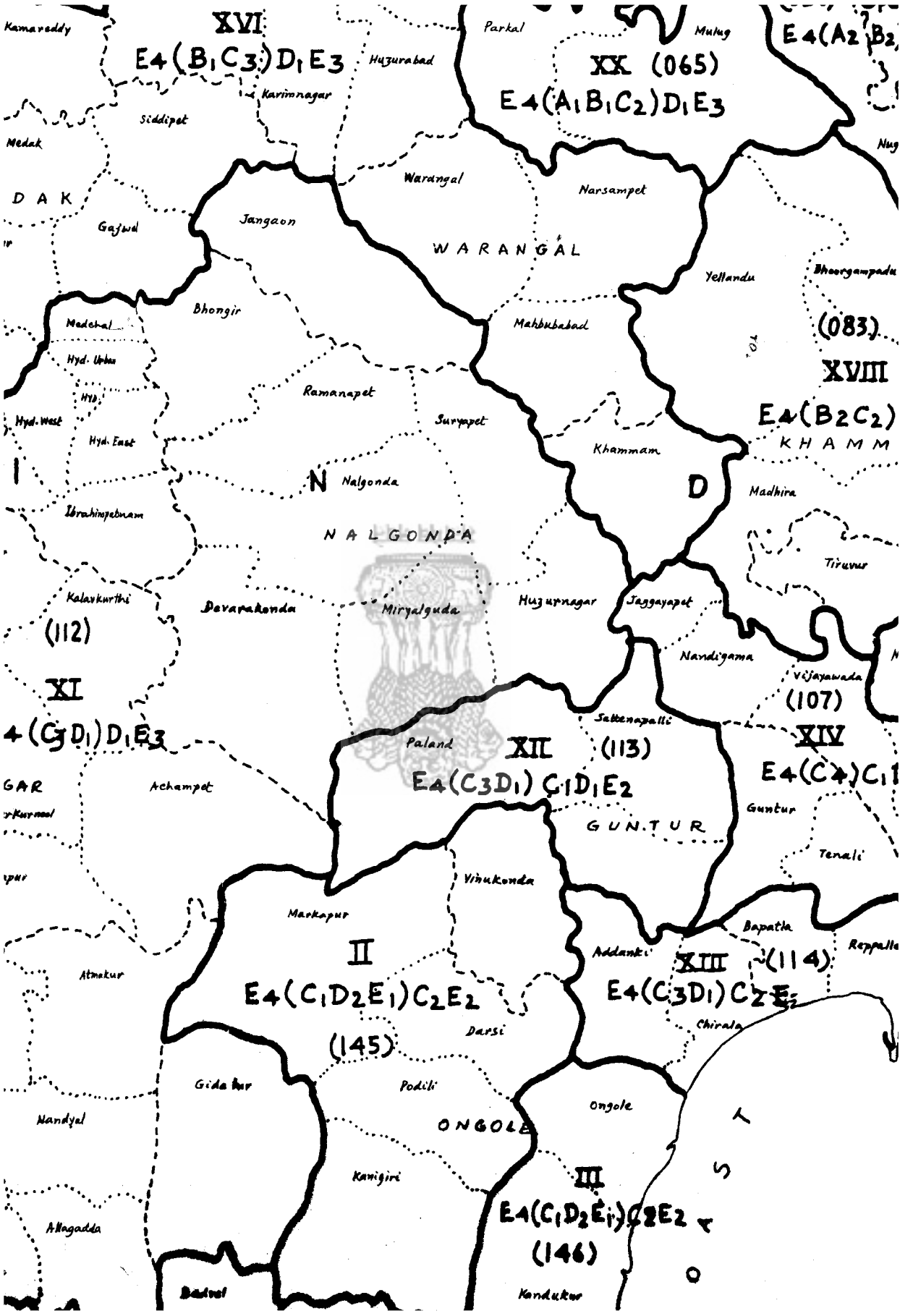
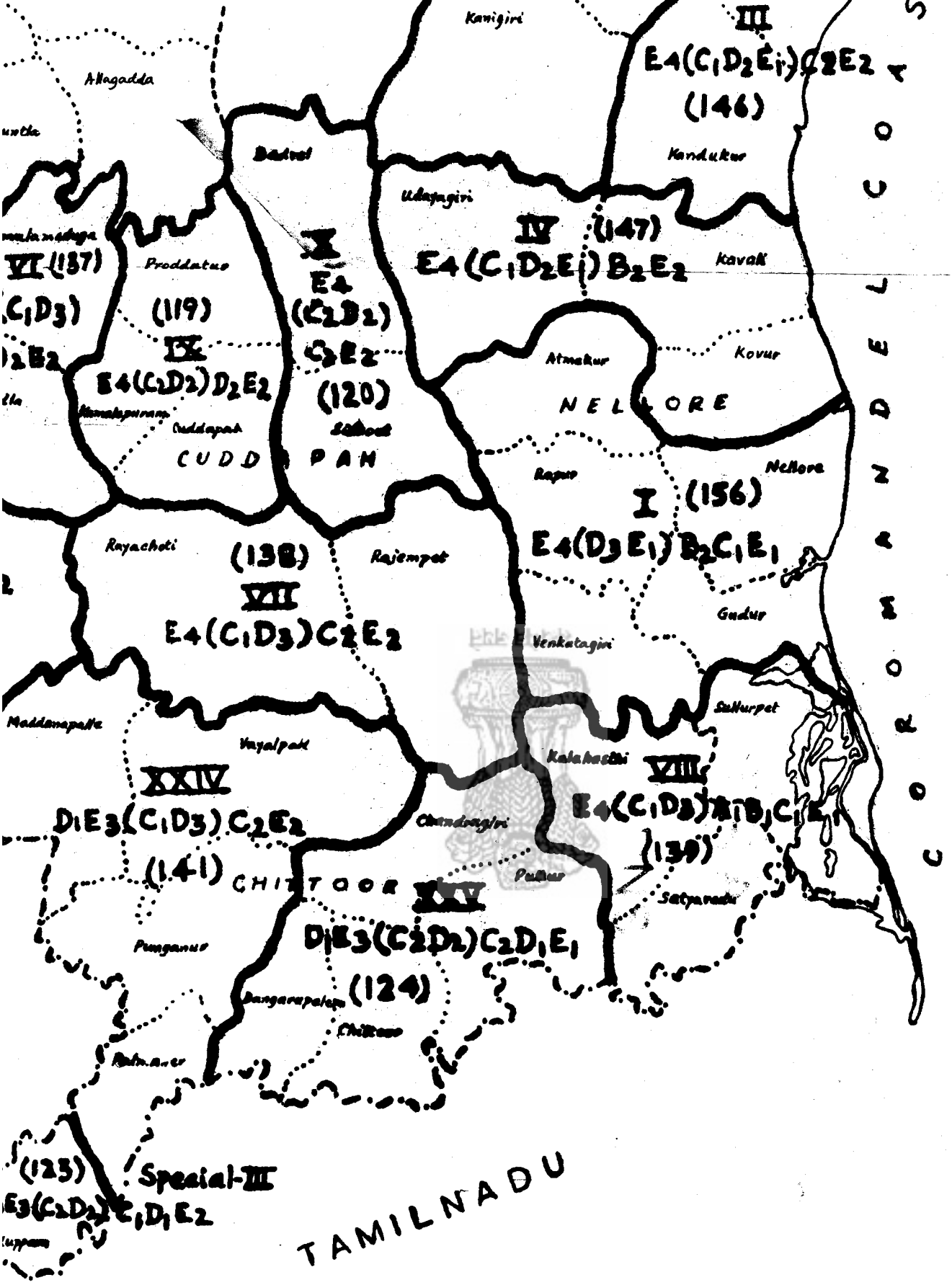

Tandur
HYDERABAD
Hyd. West
Chevella
Pargi
Kondagal
Shadnagar
(112)
Mahbubnagar
XI
E4(C3D1)
Makthal
Wanaparthi
MAHBUBNAGAR
Nagarkurnool
Gadwal
Kollapur
Alampur
Adoni
Kurnool
Nandikotkur
Pattikonda
KURNOOL
Alur
Dhone
Nandyal
V
E4(C1D3) D1E3
(136)
Banganapalle
Allagadda
Koilkuntla
Uravakonda
Gooty
Tadpatri
Rayadurg
(150)
XXII
D1E3(C1D1E2)
D1E3
Anantapur
ANANTAPUR
Sammalamadugu
VI (137)
E4(C1D3)
D2B2
Pulivendla
Kalyandurg
Dharmavaram
(148)
Kodiri
XXIII
D1E3(C1D2E1)C1D1E2
Penukonda

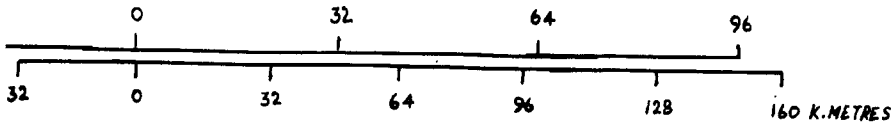

MAHARAS
KA
Adilaba
Boath
(065)
XX
E4(A1B1C2)
Mudhol
Nirmal
Armur
XVIII
E4(B2C2)
(083)
Bodhan
(077)
XIX
E4(B3C1)D1E3
Nizamabad
Madnur
Banswada
Yellapaddy
Kamareddy
Narayankhed
Andole
Medak
MEDAK
Zahirabad
Narsapur
Gaj
Sangareddy
Medchal
Hyd. Urbn
Vicarabad
Tandur
HYDERABAD
Hyd. West
Hyd

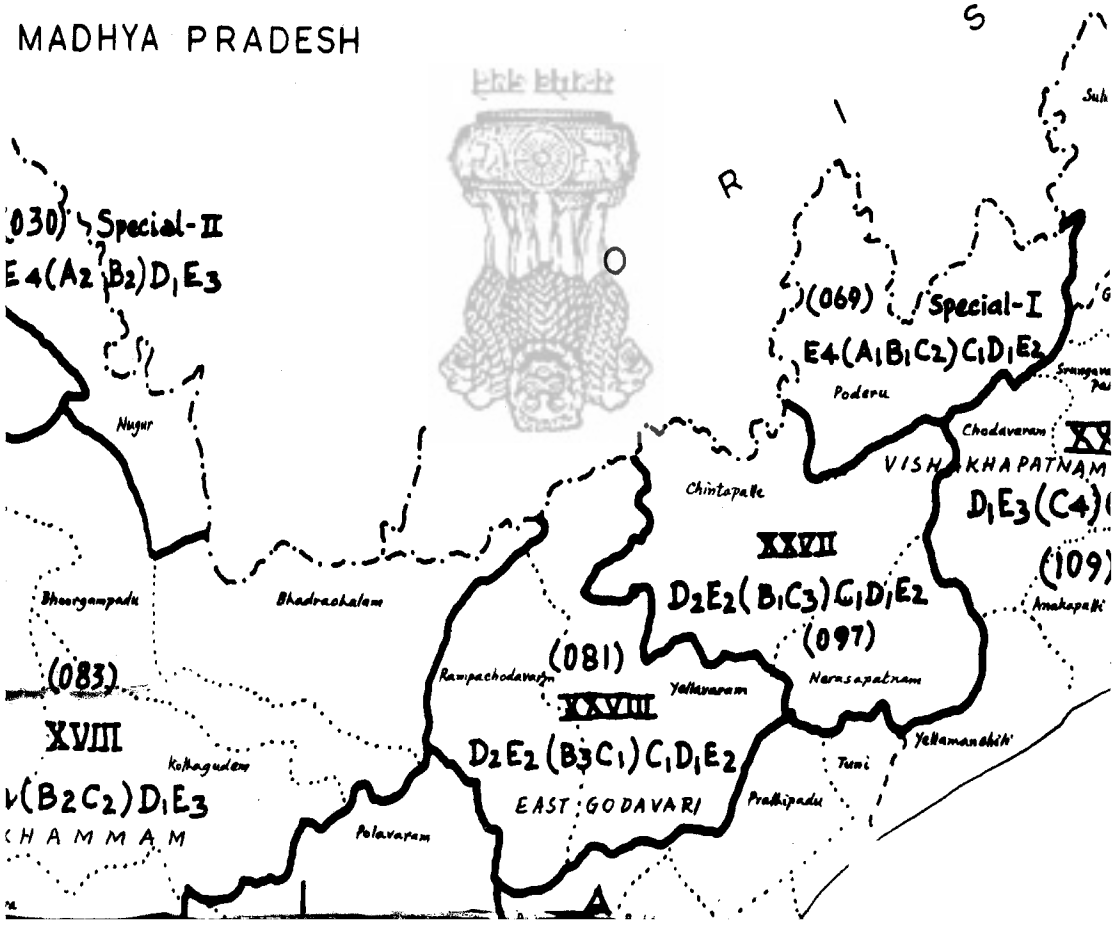

AND
RAIN
S H T R A
MILES 32 0
32 0
Adilabad
Boath
Utnur
Asifabad
Sirpur
(065)
XX
ADILABAD
Khanapur
E4(A2B1C1)D1E3
XXI
(037)
Chinnur
Lakshettipet
Jagtial
Metpalle
XVIII
(083)
Pedapalli
Manthani
MADHYA
KARIMNAGAR
Sirsilla
(094)
XVI
E4(B1C3)D1E3
Huzurabad
Karimnagar
Siddipet
Parkal
Mulug
XX (065)
E4(A1B1C2)D1E3
(030) Speci
E4(A2B2)
Nugur
Warangal
Narsampet
Jangaon
WARANGAL
Gajwel
Bhongir
Medchal
Mahbubabad
Yellandu
Bhoorgampadu
(083)

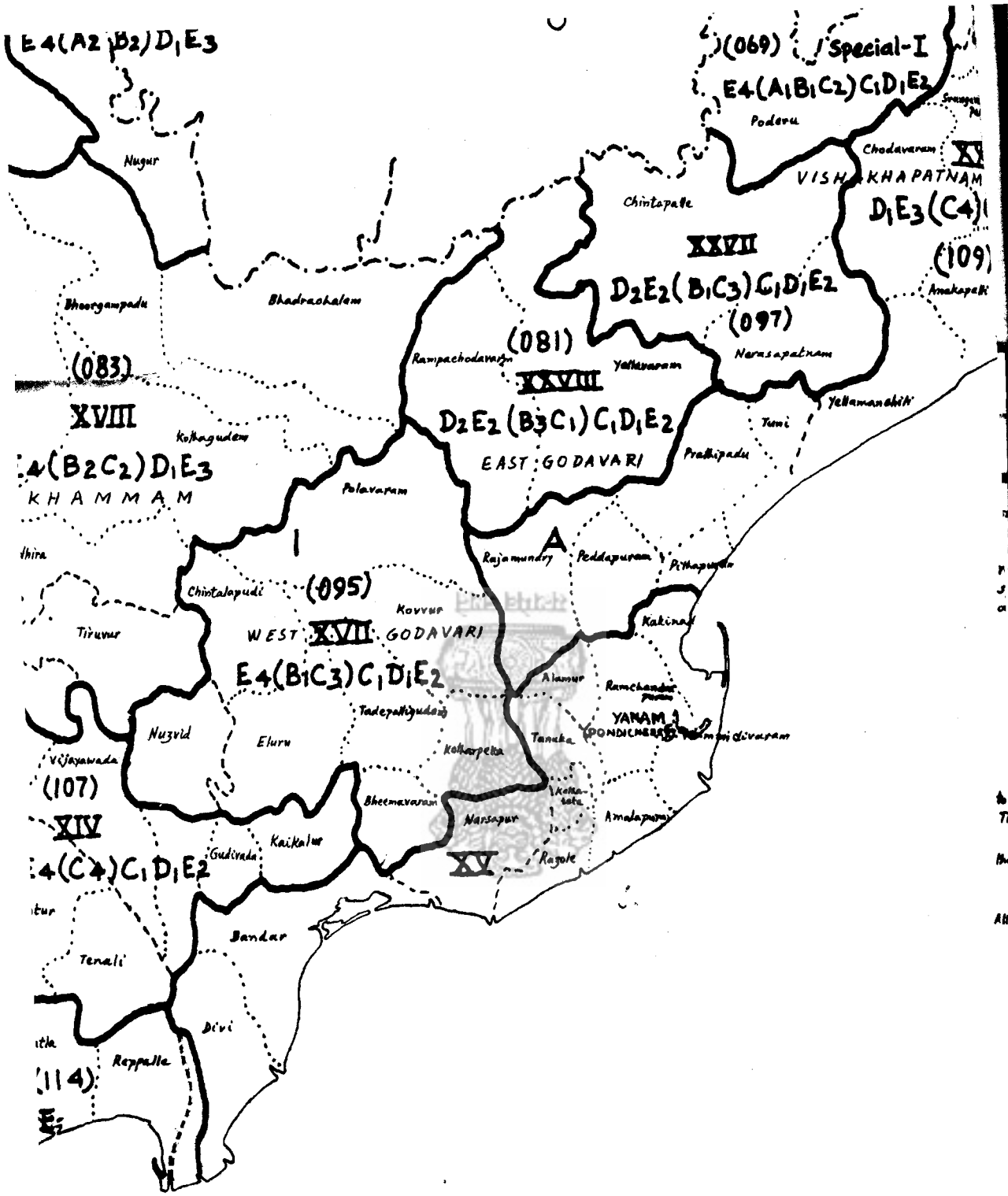

XVI
E4(B1C3)D1E3
Kamareddy
Karimnagar
Huzurabad
Siddipet
Medak
DAK
Gajwel
Jangaon
Warangal
Narsampet
WARANGAL
Parkal
Mulug
XX (065)
E4(A1B1C2)D1E3
Yellandu
Bhoorgampadu
(083)
XVIII
E4(B2C2)
KHAMM
Bhongir
Medchal
Hyd. Urban
Hyd.
Hyd. West
Hyd. East
Ramanapet
Suryapet
Mahbubabad
Khammam
D
Madhira
Tiruvur
N
Nalgonda
NALGONDA
Ibrahimpatnam
Kalvakurthi
(112)
XI
4(C3D1)D1E3
Devarakonda
Miryalguda
Huzurnagar
Jaggayapet
Nandigama
Vijayawada
(107)
XIV
E4(C4)C1
Paland
XII
(113)
E4(C3D1)C1D1E2
Sattenapalli
GUNTUR
Guntur
Tenali
Achampet
Markapur
Vinukonda
II
E4(C1D2E1)C2E2
(145)
Darsi
Addanki
XIII
(114)
E4(C3D1)C2E2
Bapatla
Reppalle
Chirala
Atmakur
Nandyal
Gidalur
Podili
ONGOLE
Ongole
Kanigiri
III
E4(C1D2E1)C2E2
(146)
Allagadda
Badvel
Kanduku

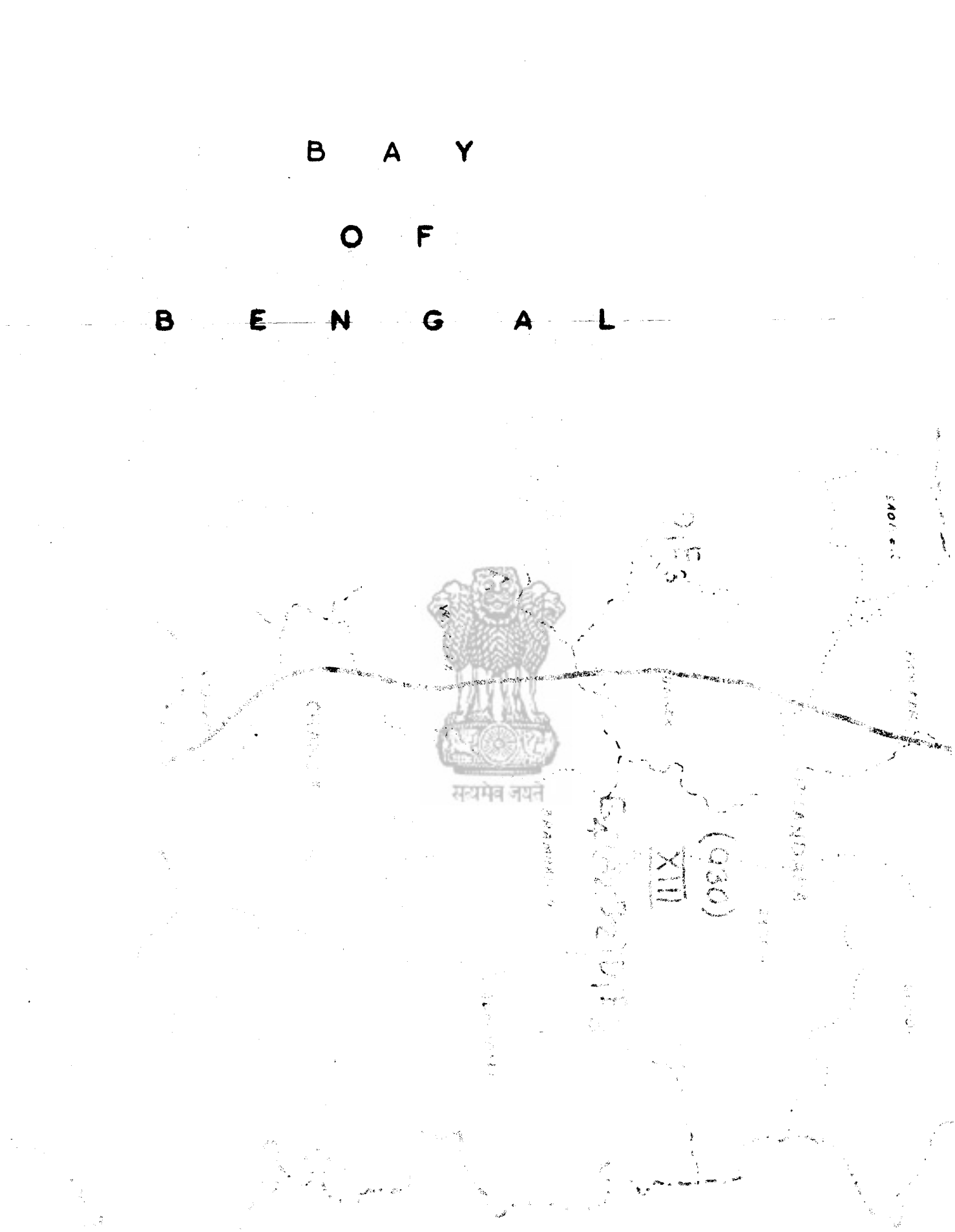

Kanigiri
III
E4(C1D2E1)C2E2
(146)
Allagadda
Badvel
Kandukur
Udayagiri
IV (147)
E4(C1D2E1)B2E2
Kavali
X
E4
(C2B2)
C2E2
(120)
Proddatur
(119)
IX
E4(C1D2)D2E2
Atmakur
Kovur
NELLORE
CUDDAPAH
Rapur
Nellore
I (156)
E4(D3E1)B2C1E1
Rayachoti
(138)
VII
E4(C1D3)C2E2
Rajampet
Gudur
Venkatagiri
Maddanapalle
Vayalpad
XXIV
D1E3(C1D3)C2E2
(141)
Kalahasthi
VIII
E4(C1D3)B1B2C1E1
(139)
Sullurpet
Chandragiri
Puttur
CHITTOOR
XXV
D1E3(C2D2)C2D1E1
(124)
Satyavedu
Punganur
Chittoor
(123)
Special-III
TAMILNADU
COROMANDEL COAST

ANDHRA PRADESH
RAINFALL PATTERNS

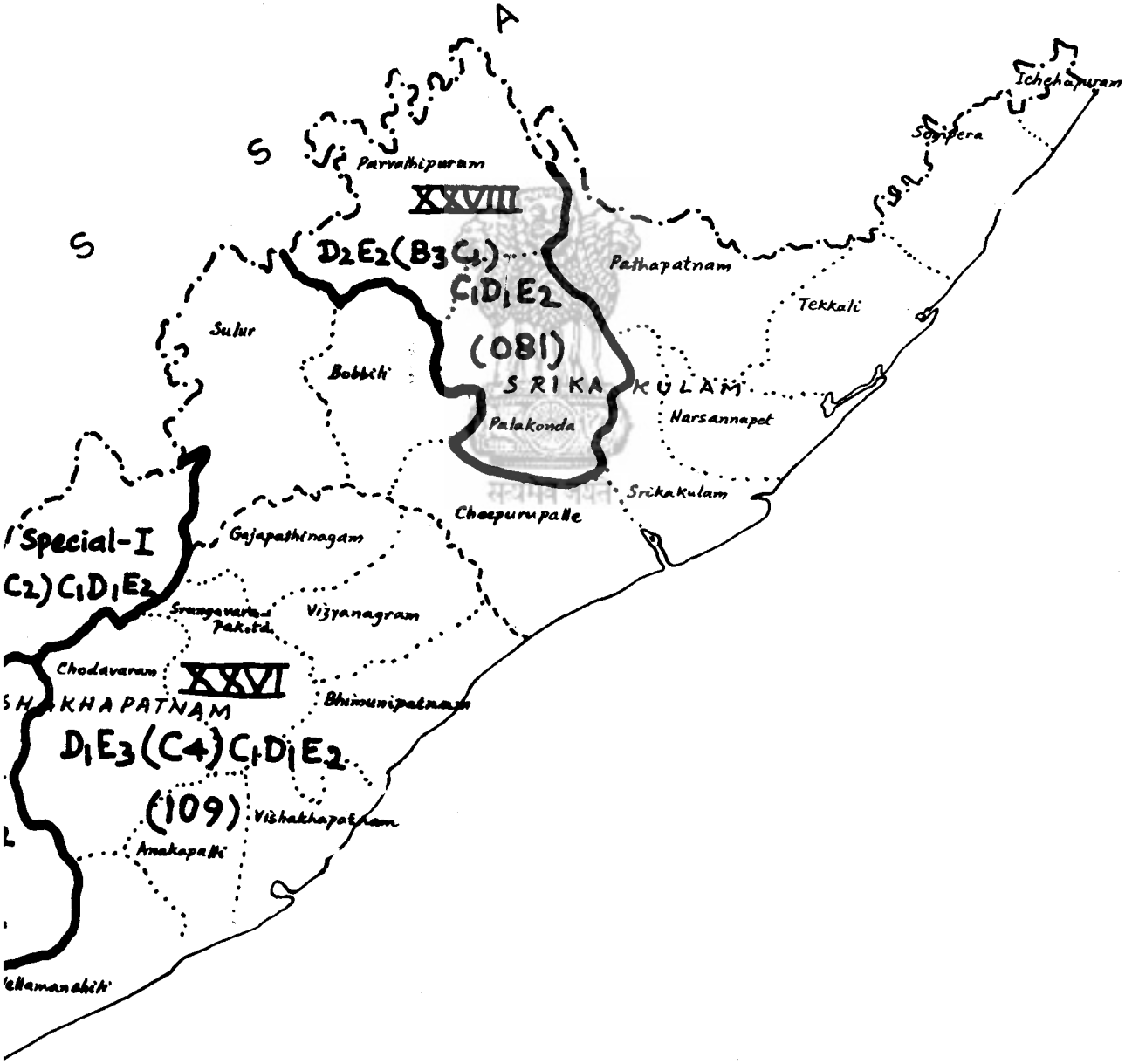





E4(A2 B2) D1E3
(069) Special-I
E4(A1B1C2)C1D1E2
Poderu
Nugur
Chodavaram
XI
VISHAKHAPATNAM
D1E3(C4)
(109)
Amakapalli
Chintapalle
XXVII
D2E2(B1C3)C1D1E2
(097)
Narsapatnam
Bhadrachalam
Bhoorgampadu
(083)
XVIII
Kothagudem
E4(B2C2)D1E3
KHAMMAM
(081)
XXVIII
D2E2(B3C1)C1D1E2
EAST GODAVARI
Rampachodavaram
Yellavaram
Yellamanchili
Tuni
Pradipadu
Polavaram
Rajamundry
Peddapuram
Pithapuram
Kakinada
Chintalapudi
(095)
WEST GODAVARI
XVII
E4(B1C3)C1D1E2
Kovvur
Tiruvur
Nuzvid
Eluru
Tadepalligudem
Kolleru
Alamur
Ramachandrapuram
YANAM
(PONDICHERRY)
Tanuku
Vijayawada
(107)
XIV
E4(C4)C1D1E2
Bhimavaram
Narsapur
Amalapuram
Kaikalur
Gudivada
XV
Ragole
Bandar
Tenali
Divi
Repalle
(114)
BAY
OF
BENGAL



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


A
S
S
Parvathipuram
XXVIII
D2E2(B3C4)
C1D1E2
(081)
SRIKAKULAM
Pathapatnam
Tekkali
Ichchapuram
Sompera
Sulur
Bobbili
Palakonda
Narsannapet
Srikakulam
Chezurupalle
Special-I
C2)C1D1E2
Gajapathinagam
Vijyanagram
Chodavaram
XXVI
KHAPATNAM
Bhimunipatnam
D1E3(C4)C1D1E2
(109)
Vishakhapatnam
Anakapalli

LEGEND

LEGEND

The rainfall pattern which describes the distribution of monthly rainfall throughout the year is expressed in coded form with letter symbols and numerical subscripts. A letter denotes a rainfall interval and subscript to each letter the number of months in the interval

Symbol	Rainfall interval centimetres per month
A	Greater than 30
B	20-30
C	10-20
D	5-10
E	Less than 10 if the pattern begins with A or B Less than 5 if the pattern begins with C, D or E

The coded form of each pattern consists of three groups corresponding to the three seasons February to May, June to September and October to January. The central is entered in brackets.

The area covered by a rainfall pattern is termed a zone and the zones in the map are serially numbered.

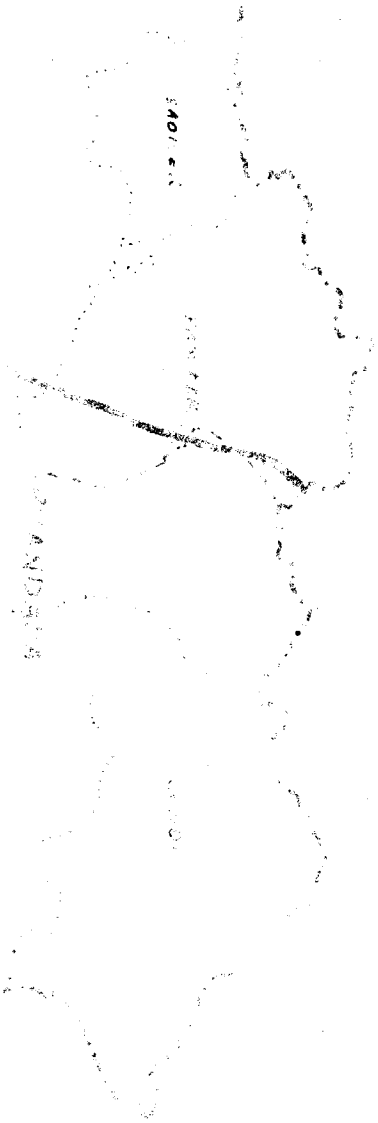
Roman numbers indicate State rainfall zones.

Three-digit figures in Arabic numerals within brackets give their corresponding All-India equivalents.

REFERENCE

- STATE BOUNDARY
- DISTRICT BOUNDARY
- TALUK BOUNDARY
- ZONE BOUNDARY

DISTRICT BOUNDARY
TALUK BOUNDARY
ZONE BOUNDARY



(from the appropriate base line

30 - 50
10 - 30
LESS THAN 10

PADDY COVERS MORE THAN 70 PERCENT OF GROSS CROPPED AREA OF THE TALUK.
R.C. (50 - 70%) AREA
OTHER PULSES (10 - 30%) AREA
PADDY (10 - 30%) AREA

FERENCE

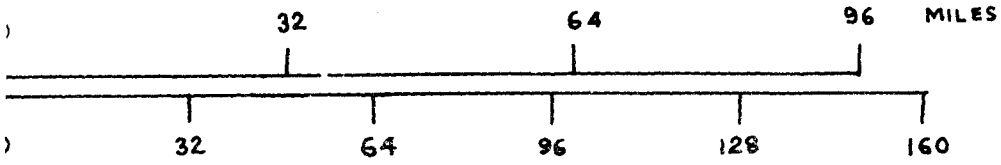
STATE BOUNDARY

DISTRICT BOUNDARY

TALUK BOUNDARY

ZONE BOUNDARY

SUB-ZONE BOUNDARY



END

SYMBOLS

Pd
L
F
R
B
Mt
Jk
Jr
M
W
G
T
Pu
C
Gn
O
S
Ba
Oa
To
Fr

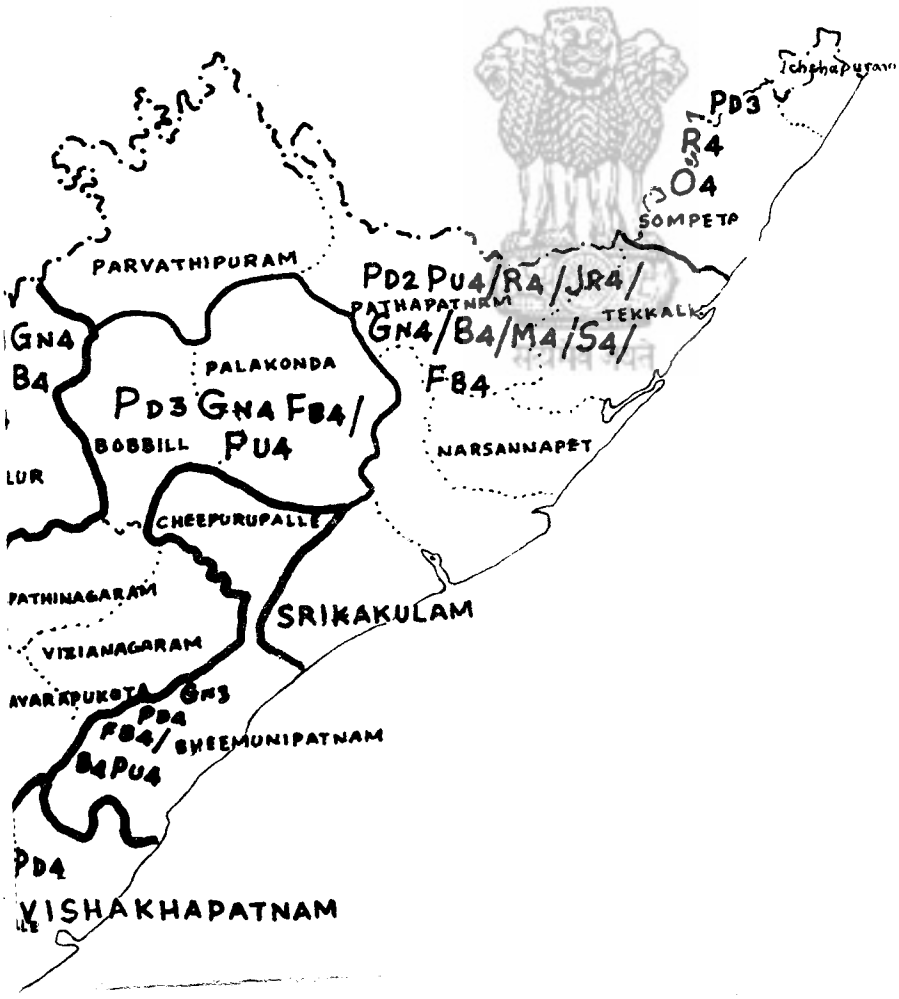
ITS OF ONE OR MORE CROPS, EACH WITH A SUBSCRIPT
IRCENTAGE AREA OF THE CROP CONCERNED.

PERCENTAGE OF GROSS CROPPED AREA

GREATER THAN	70
	50 - 70
	30 - 50
	10 - 30
LESS THAN	10

PADDY COVERS MORE THAN 70 PERCENT
OF GROSS CROPPED AREA OF THE TALUK.
RAGI (50 - 70%) AREA
OTHER PULSES (10-30%) AREA
PADDY (10 - 30%) AREA

APPENDIX VI


PARVATHIPURAM
PALAKONDA
BOBBILL
PD3 GN4 FB4/ PU4
GN4
B4
LUR
CHEEPURUPALLE
PATHINAGARAM
VIZIANAGARAM
AYARKPUKOTA
GN3
PD4
FB4/ B4PU4
BHEEMUNIPATNAM
PD4
VISHAKHAPATNAM
PD2 PU4/R4/JR4/
PATHAPATNAM
GN4/B4/M4/S4/
F B4
NARSANNAPET
TEKKALI
SOMPETA
O4
R4
PD3
Ichchapuram

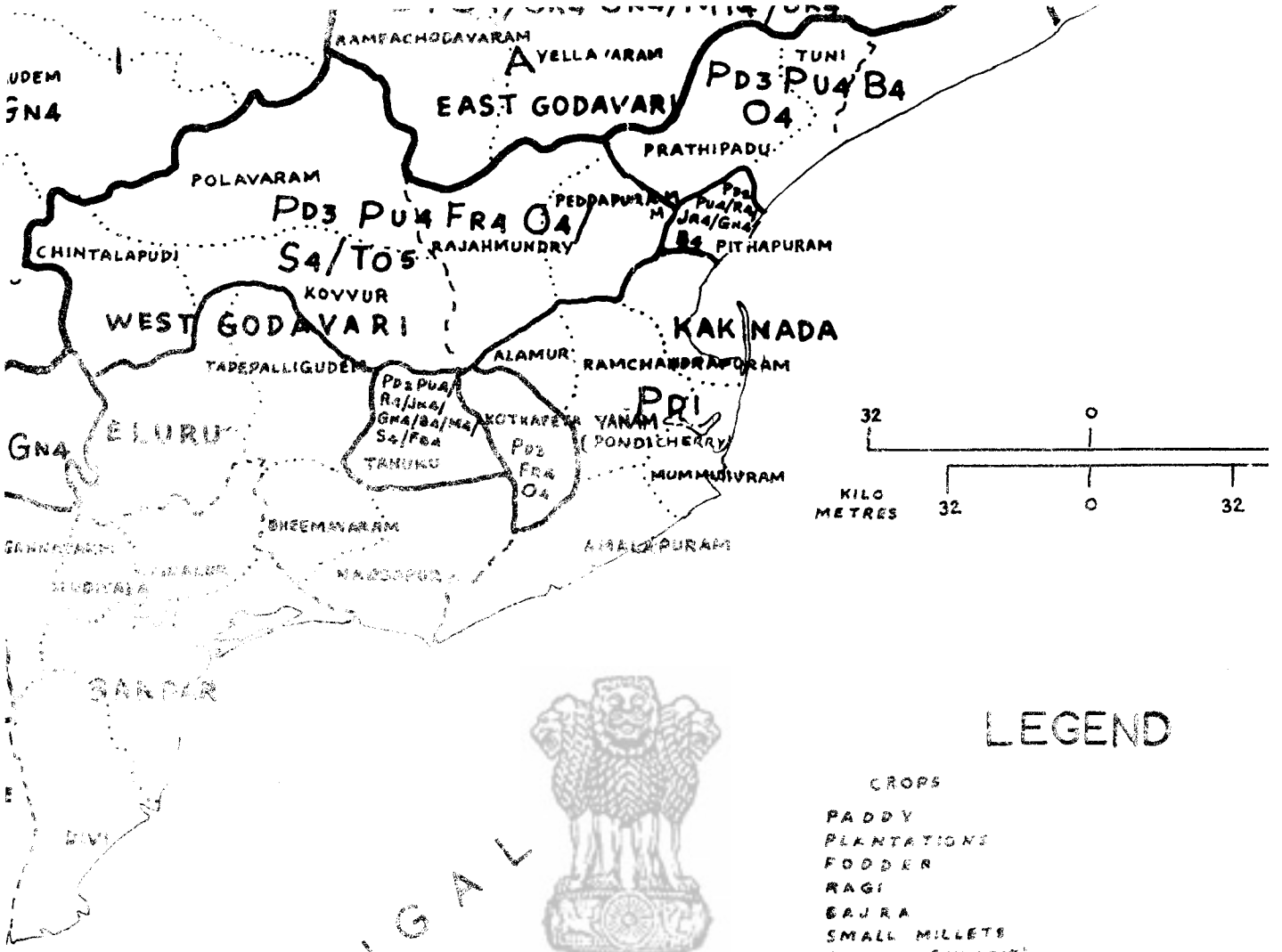
MAIZE
WHEAT
GRAM
TUR
OTHER PULSES
COTTON
GROUND NUT
OTHER OILSEEDS
SUGARCANE
BARLEY
OATS
TOBACCO
FRUITS

A CROPPING PATTERN CONSISTS OF ONE
WHICH INDICATE THE PERCENTAGE

ZON

SUB-

Above material will be received from the appropriate base line.



LEGEND

CROPS

PADDY
PLANTATIONS
FODDER
RAGI
BAJRA
SMALL MILLETS
JOWAR (KHARIF)
JOWAR (RABI)
MAIZE
WHEAT
GRAM
TUR
OTHER PULSES
COTTON
GROUND NUT
OTHER OILSEEDS
SUGARCANE
BARLEY
OATS
TOBACCO
FRUITS

A CROPPING PATTERN CONSISTS OF ONE OR MO
WHICH INDICATE THE PERCENTAGE AREA

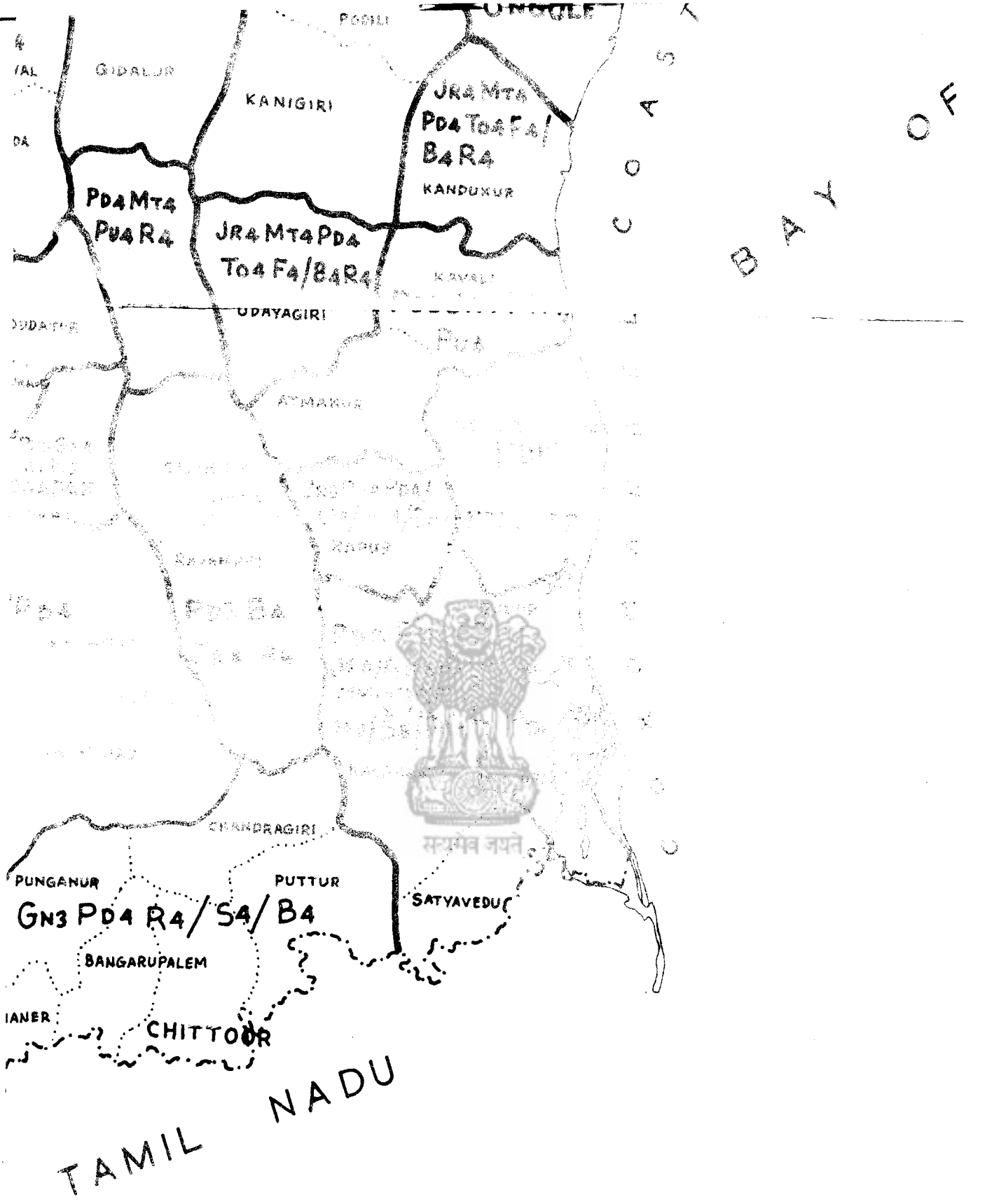
		PERCE
		G
1		
2		
3		
4		
5		

EXAMPLE

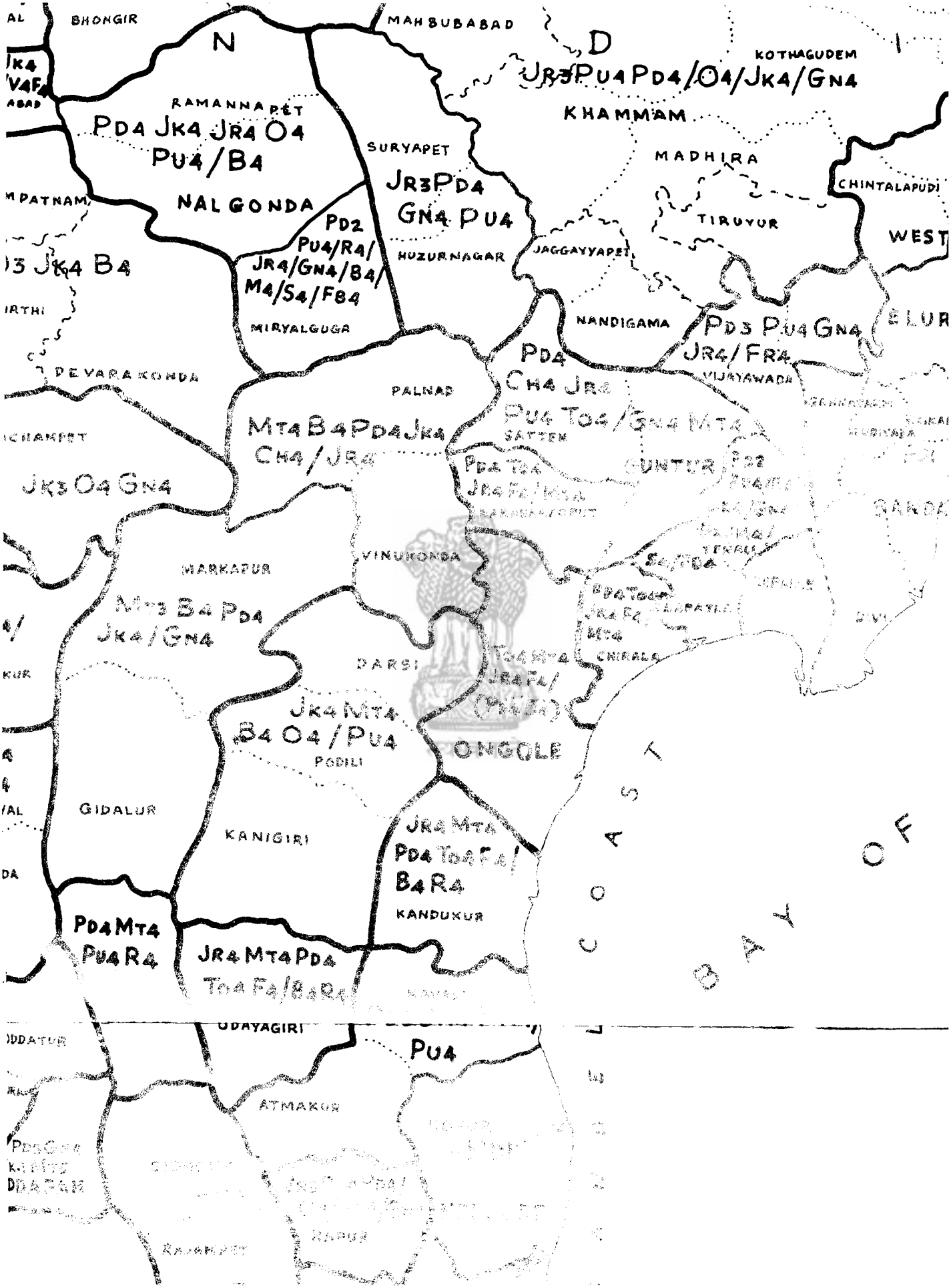
PD1

ANDHRA PRADESH

[illegible] PATTERNS



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


BHONGIR
MAHBUBABAD
KOTHAGUDEM
JR3PU4PD4/O4/JK4/GN4
KHAMMAM
RAMANNAPET
PD4 JK4 JR4 O4
PU4/B4
SURYAPET
JR3PD4
GN4 PU4
MADHIRA
CHINTALAPUDI
NALGONDA
PD2
PU4/R4/
JR4/GN4/B4/
M4/S4/FB4
HUZURNAGAR
JAGGAYYAPET
TIRUVUR
WEST
JK4 B4
MIRYALGUDA
NANDIGAMA
PD3 PU4 GN4
JR4/FR4
VIJAYAWADA
DEVARAKONDA
PD4
CH4 JR4
PU4 TO4/GN4 MT4
PALNAD
MT4 B4 PD4 JK4
CH4/JR4
SATTEN
GUNTUR
JK3 O4 GN4
VINUKONDA
MARKAPUR
MT3 B4 PD4
JK4/GN4
DARSI
JK4 MT4
B4 O4/PU4
PODILI
ONGOLE
GIDALUR
KANIGIRI
JR4 MT4
PD4 TO4 FA/
B4 R4
KANDUKUR
PD4 MT4
PU4 R4
JR4 MT4 PD4
TO4 FA/B4 R4
UDAYAGIRI
PU4
ATMAKUR
BAY OF


U4/G4
UTMUR
PD3M4
4/S4/PU4
HANAPUR
U4 M4 JK4PD4
PALLI
JAGTIAL
SIRPUR
ASIFABAD
JR3PU4PD4/O4/JK4/
GN4
LAKSHETTIPET
CHINNUR
JR4 PD4 PU4
G4
MANTHANI
MADHYA PRADESH
ISILLA
KARIMNAGAR
HUZURABAD
PARKAL
MULUG
NUGUR
PD2 PU4/R4/JR4/GN4/
B4/M4/S4/FB4
IDDIPET
I4 PD4 JK4
4/R4
PD4 PU4 M4 JR4/JK4
WARANGAL
NARSAMPET
BHOORGAMPADU
JANGAON
JK3PD4 O4B4/PU4
YELLANDUR
BHADRA
BHONGIR
MAHBUBABAD
N
D
KOTHAGUDEM
JR3PU4PD4/O4/JK4/GN4
RAMANNAPET
KHAMMAM

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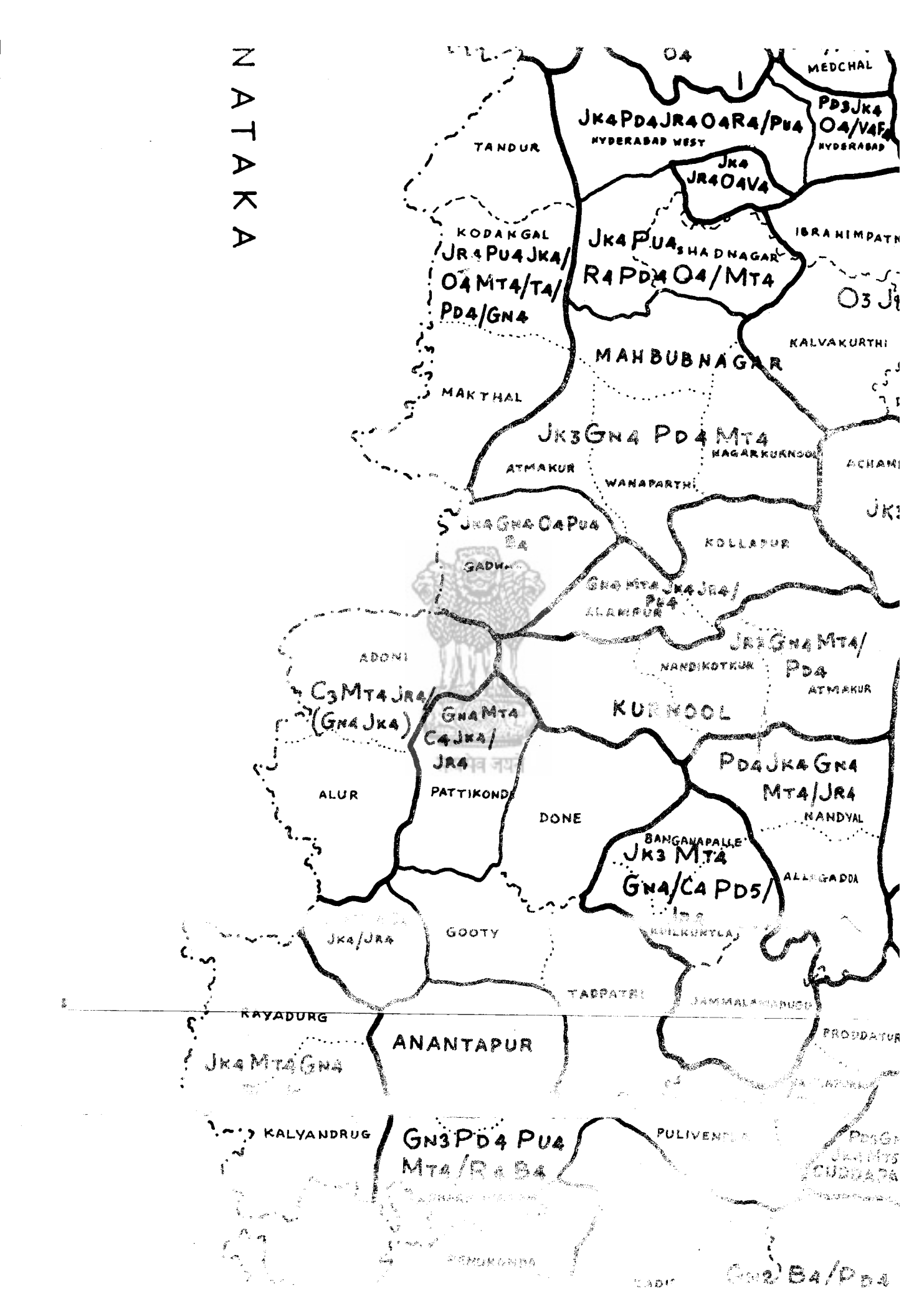
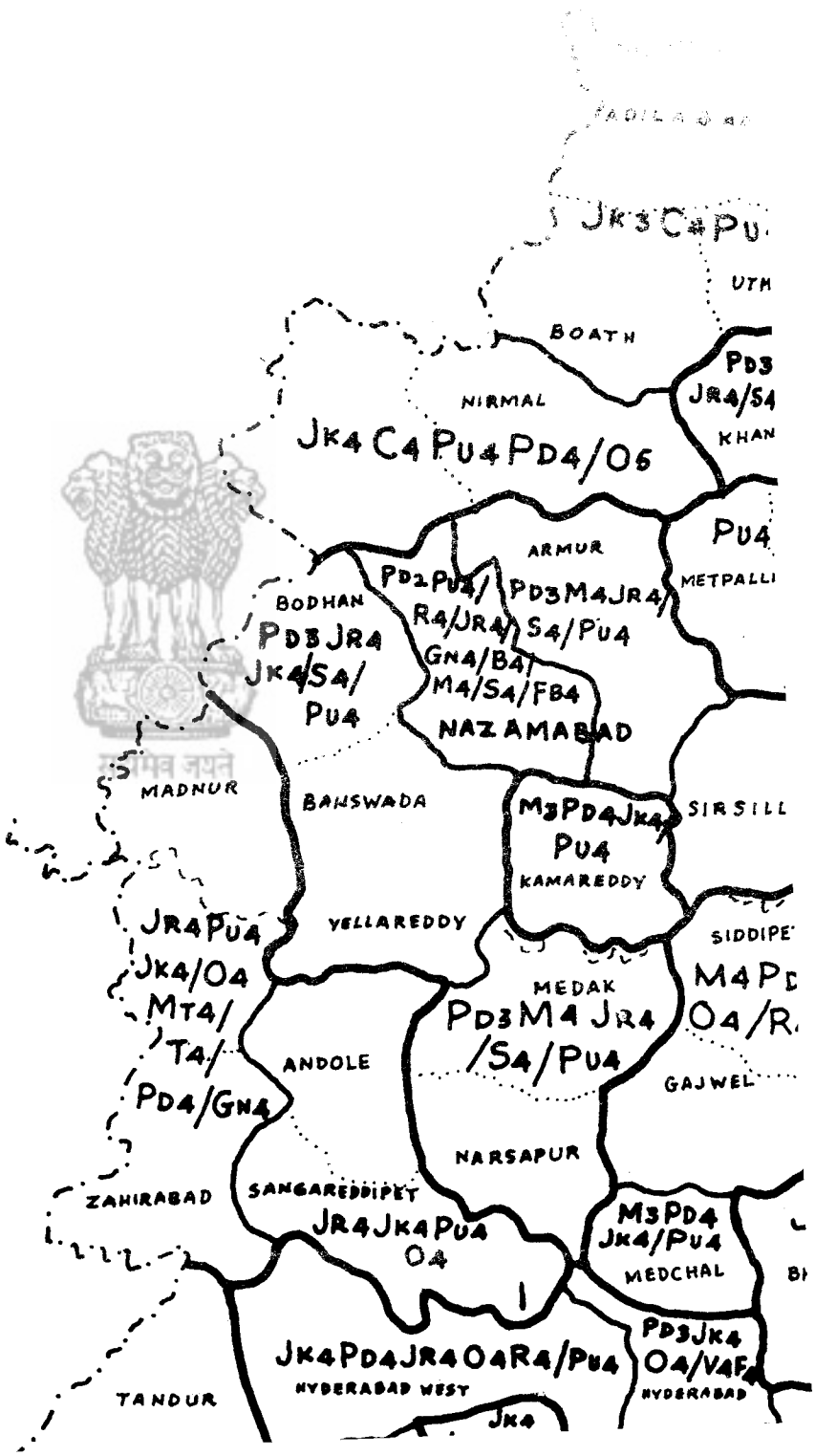
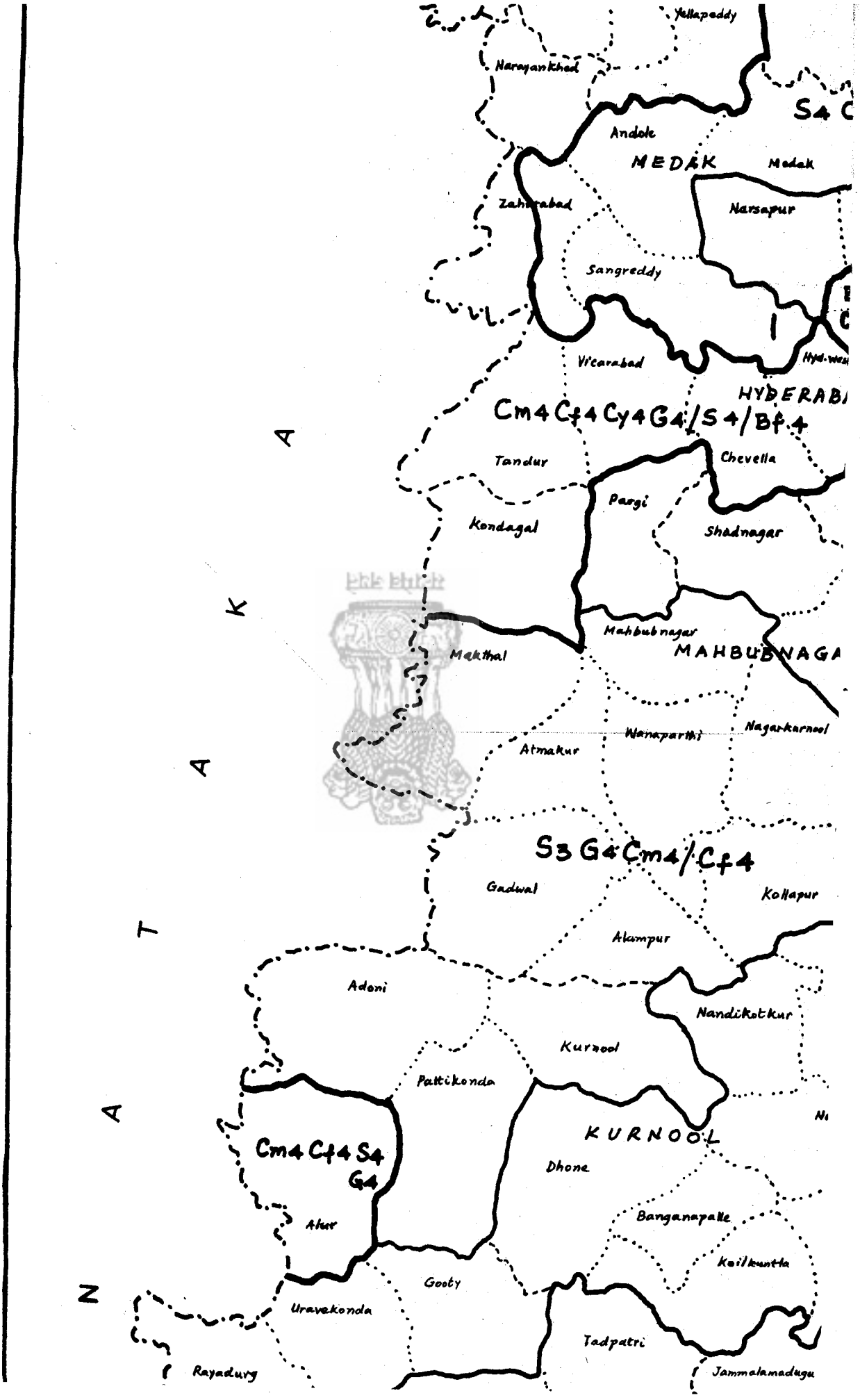
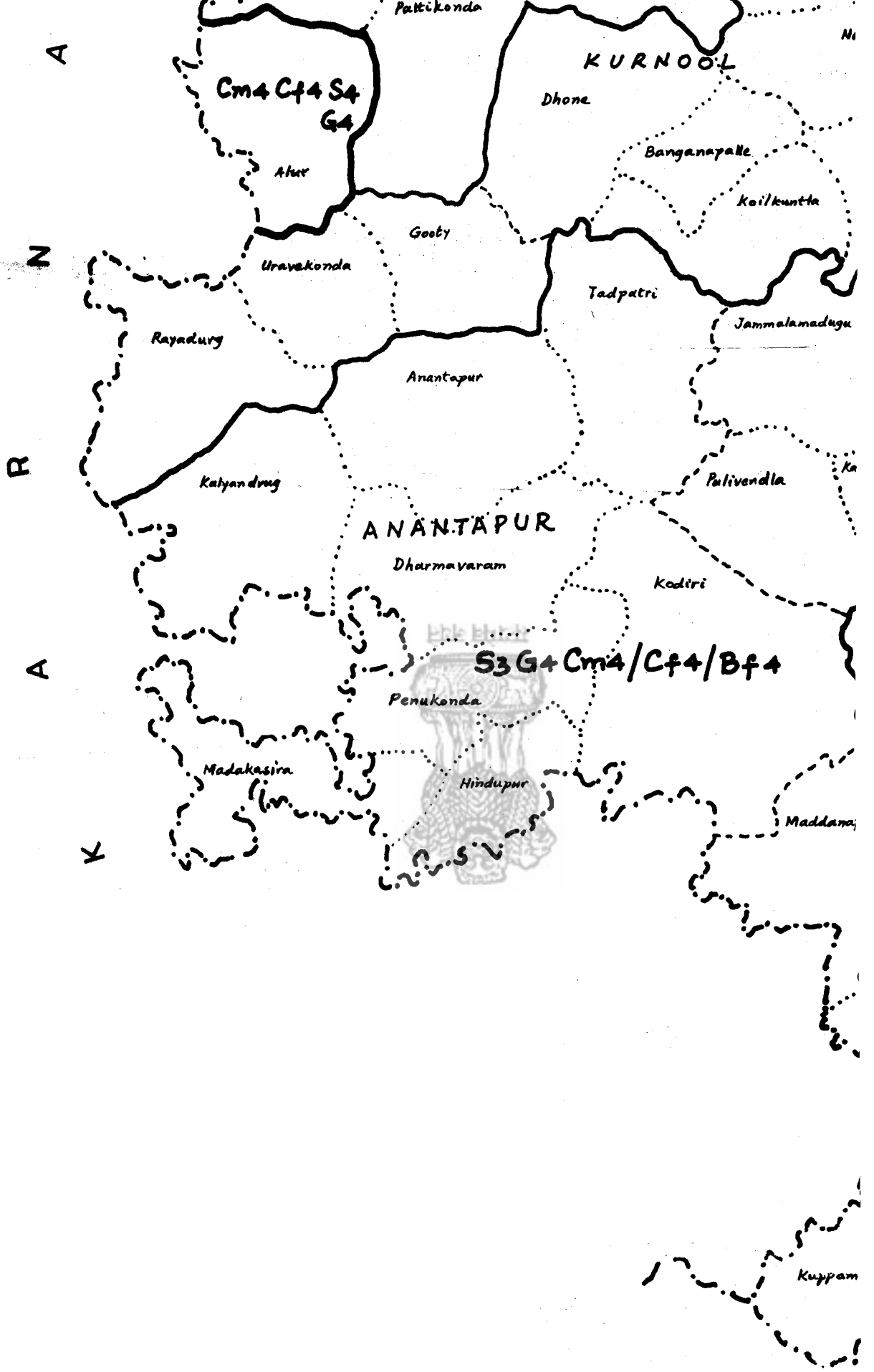

NATAKA
O4
MEDCHAL
JK4PD4JR4O4R4/PU4
HYDERABAD WEST
PD3JK4
O4/V4F4
HYDERABAD
TANDUR
JK4
JR4O4V4
KODANGAL
JR4PU4JK4/
O4MT4/T4/
PD4/GN4
JK4PU4SHADNAGAR
R4PD4O4/MT4
IBRAHIMPATN
O3 J
KALVAKURTHI
MAHBUBNAGAR
MAKTHAL
JK3GN4PD4MT4
NAGARKURNOOL
ATMAKUR
WANAPARTHI
JK3GN4C4PU4
B4
KOLLAPUR
GADW
GN4MT4JK4JR4/
PU4
ALAMPUR
ADONI
JR3GN4MT4/
PD4
NANDIKOTKUR
ATMAKUR
C3MT4JR4/
(GN4JK4)
GN4MT4
C4JK4/
JR4
KURNOOL
PD4JK4GN4
MT4/JR4
NANDYAL
ALUR
PATTIKONDA
DONE
BANGANAPALLE
JK3MT4
GN4/C4PD5/
ALLAGADDA
JK4/JR4
GOOTY
TADPATRI
RAYADURG
ANANTAPUR
PRODDATUR
JK4MT4GN4
KALYANDRUG
GN3PD4PU4
MT4/R4B4
PULIVEN
GN2B4/PD4


MAHARASHTRA
KARNATA
ADILABAD
JK3C4PU
UTN
BOATH
NIRMAL
JK4 C4 PU4 PD4/O5
PD3
JR4/S4
KHAN
PU4
METPALLI
ARMUR
PD2PU4/
R4/JR4/
PD3M4JR4/
S4/PU4
GN4/B4/
M4/S4/FB4
NAZAMABAD
BODHAN
PD3JR4
JK4/S4/
PU4
MADNUR
BANSWADA
M3PD4JK4/
PU4
KAMAREDDY
SIRSILL
YELLAREDDY
JR4PU4
JK4/O4
MT4/
T4/
PD4/GN4
SIDDIPE
M4PD
O4/R
MEDAK
PD3M4JR4
/S4/PU4
ANDOLE
GAJWEL
NARSAPUR
ZAHIRABAD
SANGAREDDIPET
JR4JK4PU4
O4
M3PD4
JK4/PU4
MEDCHAL
PD3JK4
O4/V4F
HYDERABAD
JK4PD4JR4O4R4/PU4
HYDERABAD WEST
TANDUR
JK4

G4Bf4/By4
1c1 2

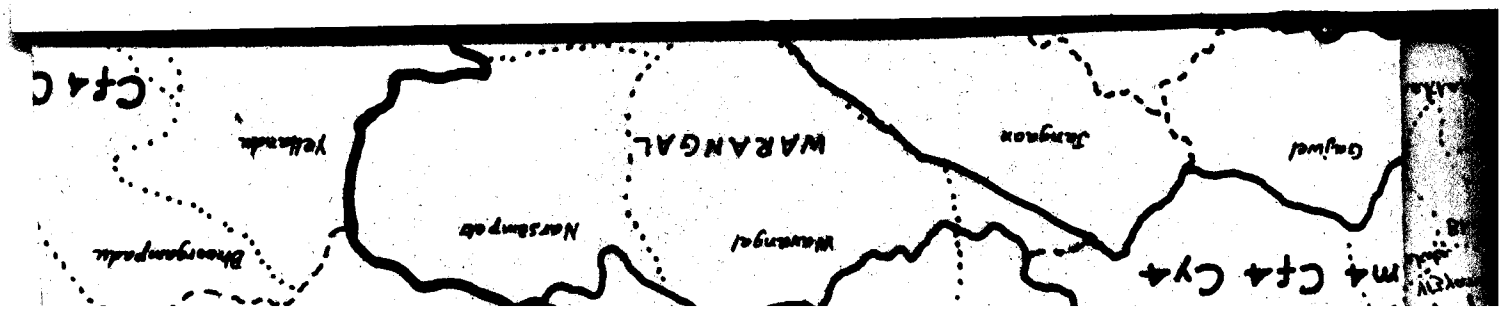

Yellapeddy
Narayankhed
Andole
MEDAK
Medak
Narsapur
Sangreddy
Vicarabad
HYDERABA
Cm4 Cf4 Cy4 G4/S4/Bf4
Tandur
Chevella
Pargi
Kondagal
Shadnagar
Mahbubnagar
MAHBUBNAGA
Makthal
Wanaparthi
Nagarkarnool
Atmakur
S3 G4 Cm4/Cf4
Gadwal
Kollapur
Alampur
Adoni
Nandikotkur
Kurnool
Pattikonda
KURNOOL
Cm4 Cf4 S4 G4
Dhone
Atur
Banganapalle
Kailkuntla
Gooty
Uravekonda
Tadpatri
Rayadurg
Jammalamadugu

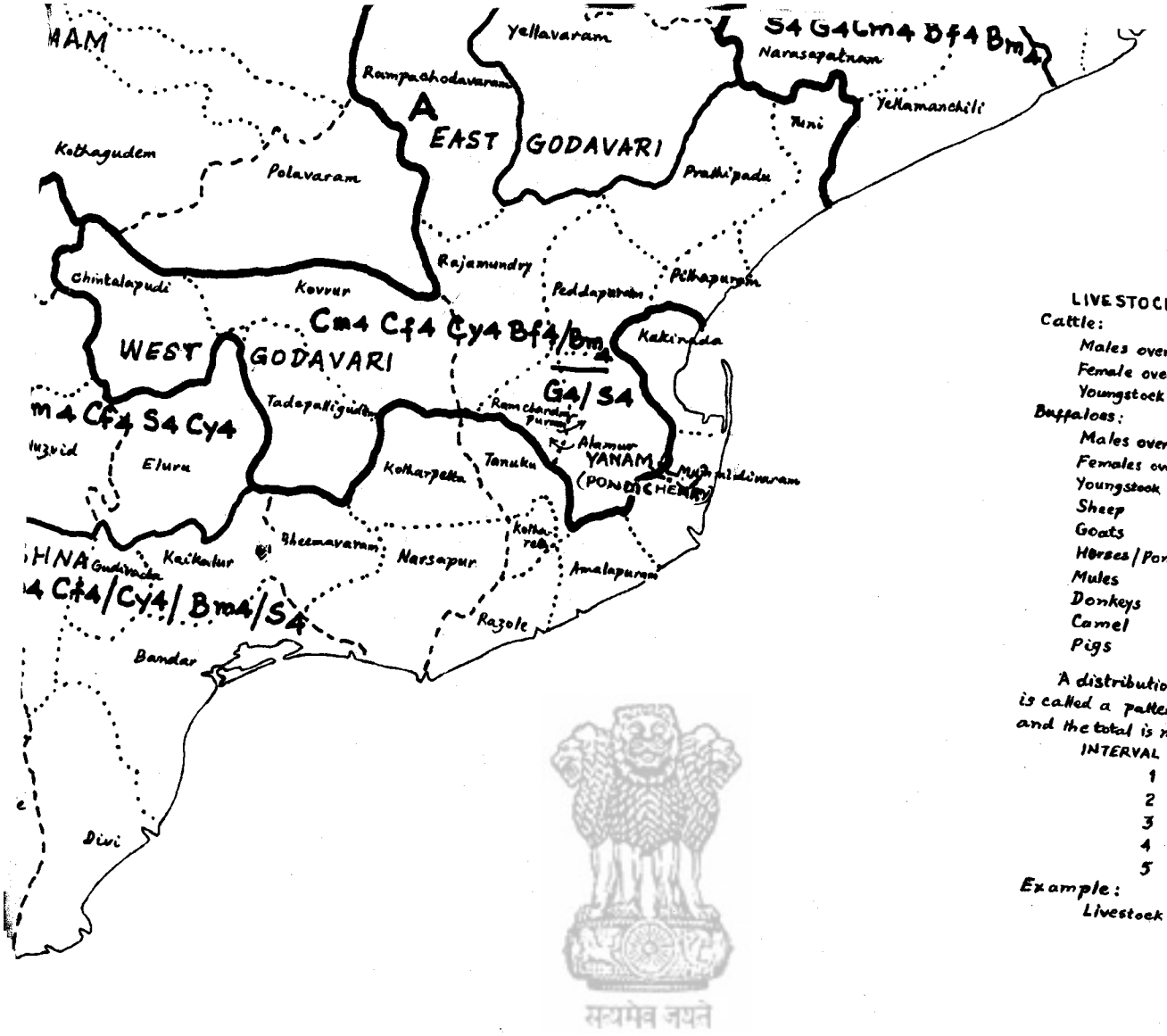


Based upon Survey of India map with the permission of the Surveyor General of India.

B E N G A L

nce of twelve nautical miles measured from the appropriate base line.





LIVESTOCK

Cattle:

Males over 3 yea

Female over 3 yea

Youngstock 3 years

Buffaloes:

Males over 3 yea

Females over 3 ye

Youngstock 3 years

Sheep

Goats

Horses/Ponies

Mules

Donkeys

Camel

Pigs

A distribution wh
is called a pattern, if
and the total is not les

INTERVAL SUBSC

1

2

3

4

5

Example:

Livestock patte

Cm3

S4

G4

REFER

Sta

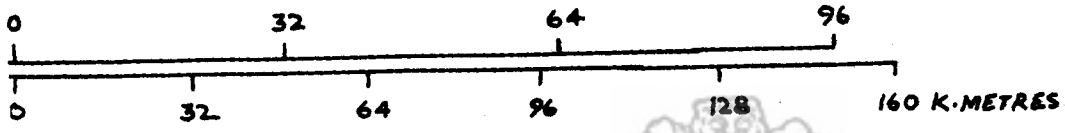
Dis

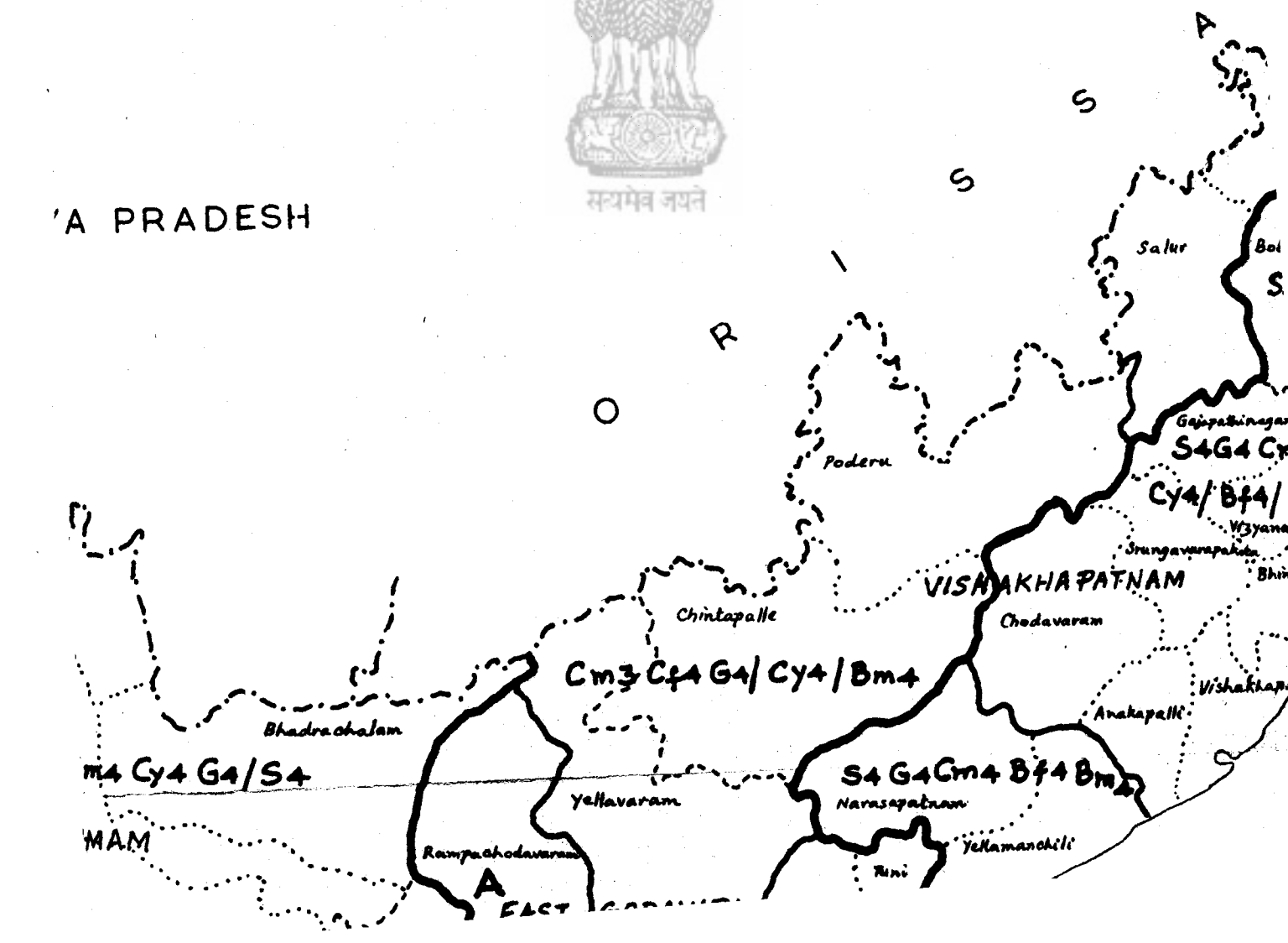
Tal

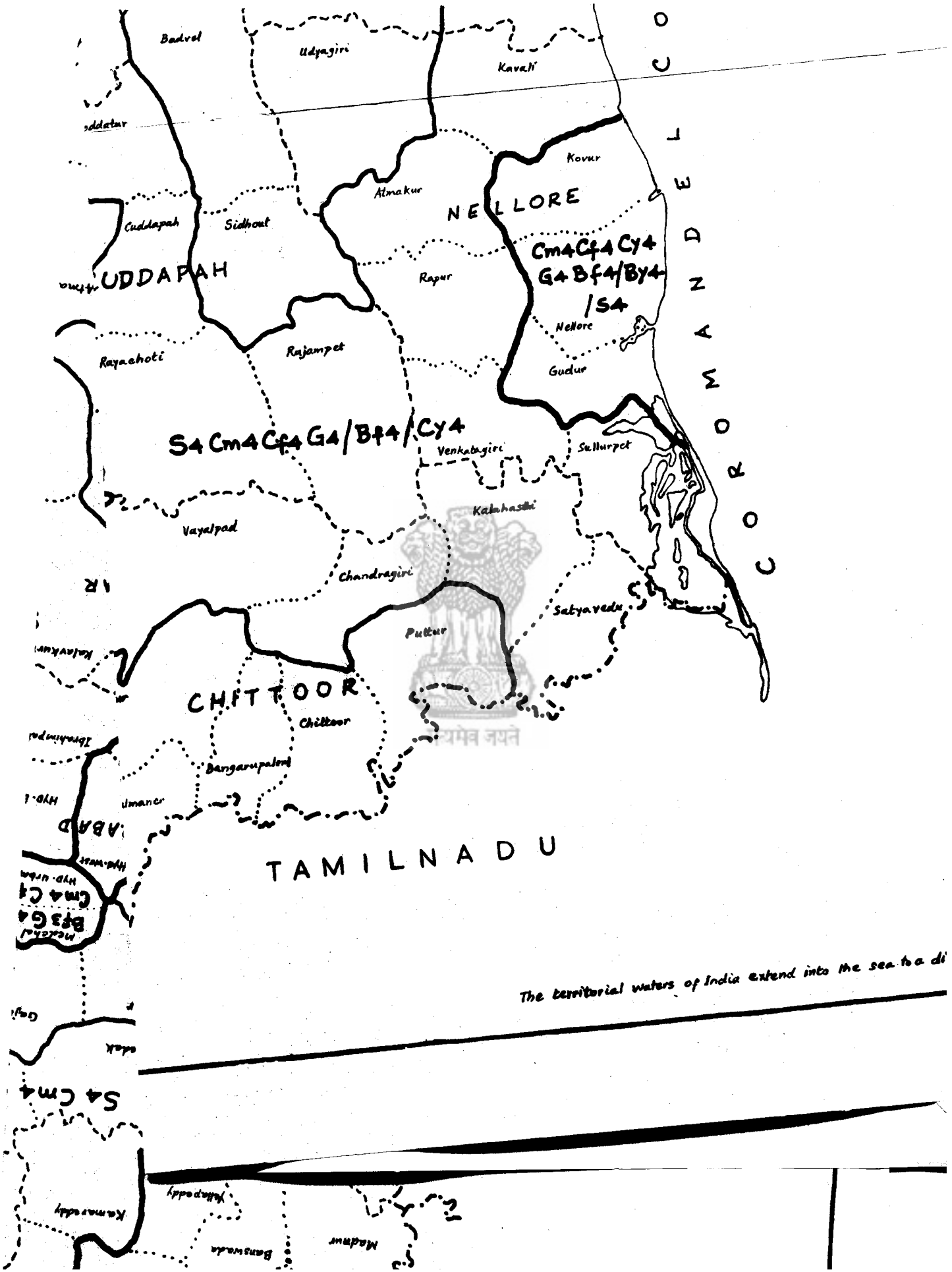
Zo

Sub

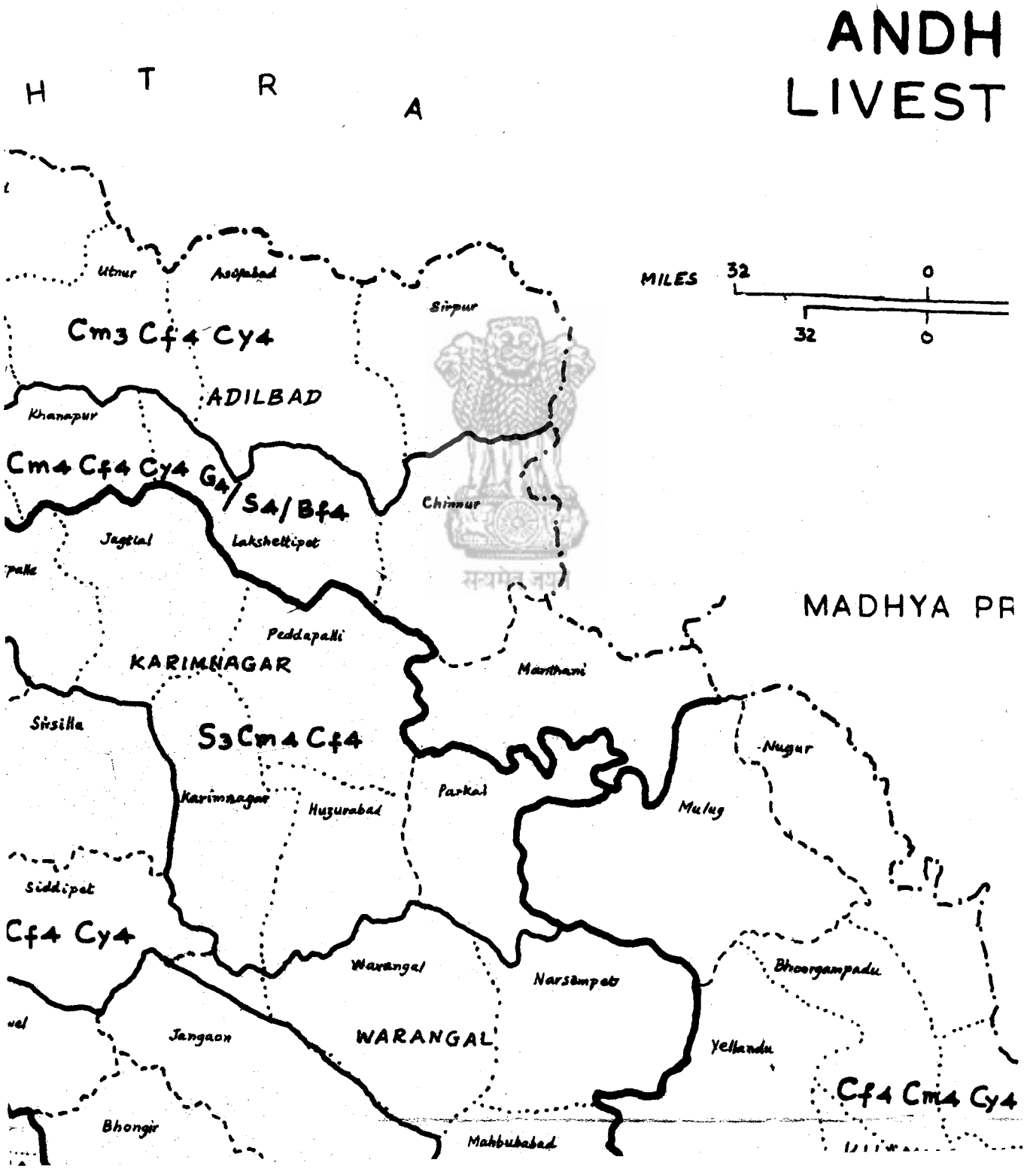
DHRA PRADESH
STOCK PATTERNS






Badvel
Udyagiri
Kavali
Kovur
Atmakur
NELLORE
Cuddapah
Sidhout
UDDAPAH
Cm4Cf4Cy4
G4Bf4/By4
/S4
Rapur
Nellore
Rayachoti
Rajampet
Gudur
S4Cm4Cf4G4/Bf4/Cy4
Venkatagiri
Sullurpet
Kalahasthi
Vayalpad
Chandragiri
Satyavedu
Puttur
CHITTOOR
Chittoor
Bangarupalem
TAMILNADU
COROMANDEL
The territorial waters of India extend into the sea to a di


Mahbubabad
KHAMMA
Ramannapet
Suryapet
Khammam
NALGONDA
S4 Cf4 Cm4
Bf4 Cy4/
By4 /G4
Madhira
Nalgonda
Tiruvur
S4 Cm4 Cf4 G4 /Bf4/Cy4
Miryalguda
Huzurnagar
Jaggayapet
Bf4 By4 Cm4
Nandigama
Devarakonda
Vijayawada
Paland
Sattenapalli
KRISHN
Bf4 By4 Cm4 C
Achampet
GUNTUR
Guntur
Narasaraopet
Vinukonda
Tenali
Markapur
Bapatla
Reppalle
Addanki
Chirala
Darsi
Gidalur
Podili
Ongole
ONGOLE
Kanigiri
S3 G4 Bf4
Kandukur
Badvel
Udayagiri
Kavali
COAST
Cuddapah
Sidhout
Atmakur
Kovur
NELLORE
UDDAPAH
Cm4 Cf4 Cy4
G4 Bf4/By4
Rapur


ANDH
LIVEST
H T R A
MILES 32 0
32 0
Utnur
Asifabad
Sirpur
Cm3 Cf4 Cy4
ADILBAD
Khanapur
Cm4 Cf4 Cy4 G4/S4/Bf4
Chinnur
Jagtial
Lakshettipet
Peddapalli
KARIMNAGAR
Manthani
MADHYA PR
Sirsilla
S3 Cm4 Cf4
Karimnagar
Huzurabad
Parkal
Mulug
Nugur
Siddipet
Cf4 Cy4
Warangal
Narsampet
Bhoopalpadu
Jangaon
WARANGAL
Yellandu
Cf4 Cm4 Cy4
Bhongir
Mahbubabad

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Bf3 G4
Cm4 Cf4
Hyd. Urban
Hyd. West
Hyd. East
HYDERABAD
Cm4 Cf4 Cy4 G4/S4/Bf4
Vicarabad
Tandur
Chevella
Ibrahimpatnam
Pargi
Kondagal
Shadnagar
Kalavkurthi
S4 Cm
Mahbubnagar
MAHBUBNAGAR
Makthal
Wanaparthi
Nagarkurnool
Atmakur
S3 G4 Cm4/Cf4
Gadwal
Kollapur
Alampur
Atmakur
Adoni
Nandikotkur
Kurnool
Pattikonda
Nandyal
KURNOOL
Cm4 Cf4 S4 G4
Dhone
Banganapalle
Allagadda
Atur
Koilkuntla
Gooty
Uravakonda
Tadpatri
Jammalamadugu
Proddatur
Rayadurg
Anantapur
Kalyandrug
Pulivendla
Kamalapuram
Cuddap
ANANTAPUR
CUDDA
Dharmavaram
Kadiri
Rayachoti


MAHARASHTRA
Adilabad
Boath
Mudhol
Nirmal
Armur
Metpalle
Bodhan
Nizamabad
NIZAMABAD
Banswada
Madnur
Kamareddy
Yellapeddy
Narayankhed
S4 Cm4 Cf4
Andole
MEDAK
Medak
Zahirabad
Narsapur
Gajwel
Sangreddy
Medchal
Bf3 G4
Cm4 Cf4
Hyd. Urban
Vikarabad
Hyd. west