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Soils of Madras State
Part I - Distribution in Various Districts

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Introduction : Madras State as in 1955 consisted of the following thirteen districts, Chinglepet, North Arcot, South Arcot, Salem, Coimbatore, Tanjore, Tiruchirapalli, Madurai, Ramanathapuram, Tirunelveli, Nilgiris, Malabar and South Kanara. It lies between longitudes 80 and 73 and latitudes 9 and 13. The total area of the State is about 38,500,000 acres and the total population is 42 millions. Rice is the staple food of the majority of the population with millets occupying the second place. The State is bound by the Bay of Bengal on the east and the Arabian sea borders the coast line on the west in the districts of Malabar and South Canara. No part of the State is very far from the sea and the climate on the whole is equable. The temperature in the interior districts may record of 100° to 105° in the height of summer while in the Coastal districts a maximum temperature near about 100° is normal. The west coast districts of Malabar and South Kanara enjoy an annual rainfall of about 100 to 150 inches while the east coast and the interior districts get an annual precipitation of about 30 to 40 inches only. In the Western region the rainfall is received mainly in the South West Monsoon (June to September) while in the rest of the state the North East Monsoon (October to December) is more important. Rainfall has had a profound influence on the type of soil which has developed in and regions of the state. .s of the

The total soil area of the State is in the neighbourhood million acres not taking into account Nilgiris district which not been clearly classified. For revenue purposes, the soils have classified into Black, Red, Alluvial and Arenaceous soils. The distribution of the different types in the various districts is given the table.

TABLE I.

No.	Districts	Soils			Soil	Sand
		Black	Red	Aluvial (in acres		
1.	Chingleput	5,99,510	12,45,140	— 3·5	2·3	78·4
2.	North Arcot	2,12,301	11,40,801	— 0·3	1·9	104·2
3.	South Arcot	15,06,811	15,20,380	— 2·8	0·5	73·4
4.	Salem	4,29,192	11,49,616			

·1 3·7 32·2 45·6
·6 5·9 63·9 96·0
43·0 42·3

(Table I Contd.)

S. No.	Districts	Soils				Soil as percentage of total			
		Black	Rod	Aluvial (in acres)	Arena-ceous	Black	Red	Alu-vial	Arona ceous
5.	Coimbatore	5,38,178	33,41,077	—	—	12·81	75·41	—	—
6.	Tanjore	5,70,456	2,42,993	2,38,724	84,788	23·78	10·14	12·03	3·53
7.	Tiruchirapalli	1,25,150	2,34,007	2,94,672	—	15·23	30 0	37·0	—
8.	Madurai	2,03,048	21,42,162	—	—	6·63	40 60	—	—
9.	Tirunelveli	6,38,236	21,36,965	—	—	24.00	73·00	—	—
10.	Ramanatha-puram	18,74,400	10,40,220	—	—	60·88	33·79	—	—
11.	Nilgiris	—	Not clearly classified			—	—	—	—
12.	Malabar	—	26,00,963	—	16,538	—	87·5	—	5·10
13.	South Kanara	—	2,101,915	—	34,714	—	78.90	—	1·30

TABLE II.

Distribution of Soils in Madras (Zacharias 1950.)

S. No.	Districts	Distribution of soils (Zacharias 1250)					Total (000) acres
		Black %	Red %	Arena-ceous %	Alluvial %	Mixed %	
1.	Chingleput	29	65	6	—	—	910
2.	South Arcot	35	62	3	—	—	1,327
3.	North Arcot	16	84	—	—	—	1,410
4.	Salem	40	60	—	—	—	1,803
5.	Coimbatore	24	76	—	—	—	963
6.	Tiruchirapalli	34	60	—	6	—	2,862
7.	Tanjore	48	21	7	24	—	1,182
8.	Madurai	14	86	—	—	—	1,322
	Ramanathapuram	73	27	—	—	—	1,123
	nelveli	40	60	—	—	—	1,090
	ar	—	99	1	—	—	2,303
	Kanara	—	98	2	—	—	1,961
	ris	—	Not recorded		—	—	—
					(Zacharias)		18,256

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The distribution of the different soils in the various taluks
e districts and some of the general features are given below :

Chingleput: The general aspect of the terrain is that of an
eries of sand-hills near the sea coast and
hills to the south. In the district there
covered with shrub jungle. The three
e the black, red and arenaceous soils.
wet and dry and tabulated in each

Taluk in each taluk	Black soil			Red soil			Arenaceous		
	wet	dry	Total	wet	dry	Total	wet	dry	Total
Maduranthakam	26·2	30·7	54·9	28·7	11·8	40·5	3·3	1·3	4·6
Conjeevaram	17·0	37·9	54·9	25·9	19·2	45·1	...	...	...
Chingleput	9·5	30·3	39·8	27·9	23·2	51·1	6·8	2·3	9·1
Saidapet	2·8	3·9	6·9	30·7	31·9	52·6	18·3	12·5	30·7
Sriperumbudur	2·2	18·4	20·6	36·4	43·0	79·4	...	...	...
Tiruvellur	7·6	17·2	24·8	46·2	29·0	75·2	...	...	...
Ponneri	0·4	5·3	5·7	43·1	46·5	87·6	6·4	0·3	6.7

Each kind of soil may be subdivided into three classes, clay, loam and sandy. Loam, clay and sand are considered in the order as regards their crop producing capacities. The red soil predominates in the northern taluks while the black soil is widespread in the southern taluks.

North Arcot: The Western portion of the district is a flat plain running upto Javadi hills. The Central and Eastern parts are mostly hilly and the western portion rises to Mysore Plateau along the Chittor District of Andhra State. The most important soil of the district is the red ferrugenous soil with the broad types, loams and sands. Black soil occurs to the extent of only about 15% and is found mainly in the neighbourhood of the rivers Palar, Ponney and Cheyar and one or two irrigation tanks. Black clay soil is found chiefly in taluks of Gudiyatham, Wallajah, Arkonam, Cheyyar and Vellore. The distribution of the soils in the various taluks of the district is given below:

Taluk 1000 acres.	Black soil			Red soil	
	Clay	Loam	Sand	Loam	Sand
Tiruppathur	0·1	3·9	0·5	28·9	61·6
Gudiyatham	3·7	28·8	9·0	7·4	72·1
Wallajah	3·0	22·6	6·2	65·6	61·9
Arkonam	2·5	22·5	15·1	43·0	42·3
Cheyyar	2·6	23·1	3·7	32·2	45·6
Wandiwash	0·4	40·6	5·9	63·9	96·0
Vellore	1·4	8·5	2·3	78·4	13·6
Polur	0·1	10·3	1·9	104·2	19·9
Tiruvannamalai & Chengam	0·6	2·8	0·5	73·4	250·6

South Arcot: The terrain in the district is gently undulating except in the taluk of Kallakurichi which is mostly hilly. Nearly 60% of the district is made up of red ferruginous soil and the black soil which forms about 35% of the total occurs chiefly in Chidambaram, Virudachalam and Cuddalore taluks. The chief areas of red soils are the taluks of Gingee, Tirukkoyilur and Kallakurichi. Arenaceous soils are found in the coastal strips of Chidambaram, Cuddalore and Tindivanam taluks. The black soil is generally more fertile than the red and arenaceous soils.

Taluks % in each taluk.	Block soil.			Red soil		Arenaceous	
	Clay	Loam	Sandy	Loam	Sandy	Loom	Sandy
Chidambaram	43	30	2	11	3	7	2
Cuddalore	6	22	8	26	29	2	6
Tirukkoyilur	1	11	10	33	44	...	...
Tindivanam	10	18	1	25	35	2	8
Villpuram	10	20	3	24	42	...	...
Gingee	....	1	...	32	66	...	...
Kallakurichi	4	18	...	46	31	...	...
Virudhachalam	22	35	5	26	12	...	...
Average	12	19	4	28	33	1	2
		35		61		3	

Salem: The district may be divided into three divisions according to elevation. These are the Balaghat, Maraschal and Talaghat divisions, 3000, 1800 and 1000 feet respectively above the sealevel. The important soils of the district are the red and black soils with subdivisions into clayey, loamy and sandy groups. The black soil is more fertile than the red soil and occurs to small extent in nearly all the taluks particularly Dharmapuri and Krishnagiri. The red soil comprises three-fourths of the total land area.

Taluks % in each Taluk	Black Soil		Sandy	Red Soil	
	Clay	Loam		Loamy	Sandy
Hosur	...	8	11	19	61
Krishnagiri	...	12	12	4	64
Dharmapuri	...	20	6	9	64
Harur	1	7	1	10	81

Taluks. % in each taluk	Black Soil. Clay.	Loam	Sandy	Red Soil. Loamy.	Sandy.
Omalur	2	5	12	22	57
Tiruchengode	1	3	1	13	80
Salem	2	5	2	22	67
Attur	13	11	3	30	42
Namakkal	1	9	2	26	58
Rasipuram	2	6	3	23	64
Average	2	9	6	18	63

Coimbatore: Red and black soils occur side by side in many localities in the district. Red soil is loamy to sandy in character while the black is often clayey and sometimes loamy. The black soil is more fertile than the red soil. The rainfall in the district is on the average 20″ to 25″ per annum and water has been the limiting factor for cultivation. Well irrigation is the chief form of irrigation in the district. The extent of black and red soils of various types occurring in the taluks are approximately as follows:—

Taluk. % of total	Black soil. Clay.	Loam.	Sandy	Red soil. Loam	Sandy.
Kollegal	—	13·9	3.2	51·3	31·6
Gobichettipalayam	—	8·0	—	32·5	59·5
Bhavani	—	3·6	0·3	11·7	84·3
Erode	—	1·2	—	18·8	80·0
Dharapuram	0·2	1·0	—	10·6	85·2
Udumalpet	12·4	11·0	0·4	17·7	57·7
Palladam	6·0	7·9	8·2	14·1	63·8
Coimbatore	11·2	13·8	0·7	35·6	38·7
Avanashi	0·2	5·4	0·6	22·7	71·1
Pollachi	3·4	2·7	—	39·3	34·4

Tanjore: It is the granary of Madras State since most of the other districts depend on Tanjore for their rice. The northern and eastern portions of the district form the delta of Cauvery which irrigates more than half of the area. The Cauvery old delta comprises of the taluks of Kumbakonam, Mayavaram, Shiali and Nannilam and parts of Tanjore, Papanasam, Mannargudi, Tiruthuraipundi and Nagapattinam Taluks. The area brought under irrigation in the southern part of the district is known as the new delta and includes the whole of Pattukkottai Taluk, southern portion of Tanjore and Papanasam Taluks, the western portion of Mannargudi Taluk and parts of Arantangi Taluk. The soil in the new delta is lighter

and less fertile than the Cauvery Alluvium which forms the cultivated soil in the old delta. The distribution of soils in the different taluks of the district is as shown in the table :—

Taluks.	Wet. % of total wet.				Dry. % of total dry.			
	Alluvial.	Black.	Red.	Arenacious.	Alluvial.	Black	Red	Arenacious.
Tanjore	32	39	29	—	6	10	84	—
Papanasam	28	68	4	—	38	22	40	—
Kumbakonam	64	36	—	—	59	41	—	—
Mayavaram	70	23	—	7	61	21	—	18
Shiali	—	76	—	24	—	53	—	47
Nannilam	55	45	—	—	56	44	—	—
Nagapattinam	—	92	—	8	—	45	—	55
Mannargudi	—	87	13	—	—	15	85	—
Tiruthuraipundi	—	93	1·0	6	—	61	11	28
Pattukkottai	—	—	99·7	0·3	—	—	99·7	0·3
Arantangi	—	—	99	1	—	—	87	13

Tiruchirapalli : Except for the upland tracts near Panchamadai hills in Musiri and Perambalur Taluks, the district as a whole is flat or gently undulating from north west to south east. A few hills are also found in the north-western part in Vaiyampatti, Marungapuri and in Kulitalai Taluk. Some isolated rock masses are found in Tiruchirapalli, Golden Rock and Ratnagiri.

The lands on either side of the Cauvery in Musiri, Lalgudi, Tiruchirapalli and Kulitalai Taluks are made up of Cauvery alluvium. The black soil is found chiefly in the eastern portion. The other type of soil present in the district is the red loamy to sandy soil and this is the main soil of the district. The distribution of the different soils in the taluks of the district is as follows :—

Taluks.	Alluvial Soil.		Black Soil.			Red Soil.	
	Clay	Loam	Clay	Loam	Sand	Loam	Sand.
	Percentage of the total for the whole district.						
Perambalur	—	—	5·0	7·5	2·3	1·0	0·7
Udayampalayam	—	—	1·0	0·3	7·2	0·4	3·0
Musiri	0·4	1·7	0·9	1·8	1·5	1·3	2·6
Lalgudi	0·3	1·2	0·6	1·2	1·0	0·9	1·8
Tiruchirapalli	0·2	0·7	0·4	0·8	0·7	0·6	1.1
Karur	—	—	0·1	0·1	—	4·6	35·1
Kulitalai	0·4	1·3	0·1	0·1	0·1	0·1	7·5

Madurai : The area is a level plain broken by isolated hills and rocks in the west. The predominant geological formation underlying the district is granite with gravelly laterite in the eastern part. The major soil type of the district is the red ferruginous soil, loamy or sandy. Black soil in considerable extent in Tirumangalam Taluk as a continuation of similar soil in Ramanathapuram and Tirunelveli Districts. In Periakulam, Mathurai, Palani and Nilakkottai Taluks there are extensive patches of black soil. The tops of the Kodai hills are covered with black soil with a dark yellowish clay substratum. The distribution of the soil in the different taluks is approximately as given below :—

Taluks.	Black Soil.	Red Soil.
Dindugal	2·8	97·2
Madurai	17·4	82·6
Melur	0·4	99·6
Nilakkottai	6·4	93·6
Palani	6·5	93·5
Periakulam	9·0	91·0
Tirumangalam	60·8	39·2

Tirunelveli : The southern half of the district contains black soil while the northern half consists of red soil, loamy or sandy in character. The Thamparvarani valley is made up of black loam. The black soil is more fertile than the red variety. The distribution of the soils in the taluks of the district is given in the following table.

Taluks In 1000 acres	Wet		Dry		Garden
	Black	Red	Black	Red	Red sandy loam
Ambasamudram	14·9	11·9	1·1	72·0	...
Kovilpatti	1·8	0·7	70·2	29·3	...
Nanguneri	0·1	10·9	2·0	87·0	...
Sankarankovil	3·6	6·8	32·4	57·2	...
Srivaikuntam	15·1	3·7	28·9	52·3	...
Tenkasi	6·5	17·3	0·7	85·5	...
Tiruchendur	7·6	8·1	3·2	81.1	...
Anjango	...	...	...	12'5	97·3
Tangarsevi	...	...	...	0·9	99·1

Ramanathapuram: The district is a part of a great plain stretching from the western Ghats to the Bay of Bengal with a few broken and detached hills in Srivilliputhur. Near the coast in the east there are a number of reefs, shoals and coral islands. 60% of the district is made up of the black soils and the rest consists of red laterite soil with some sand dunes and swamp along the coast. The black soil is found in the southern half of the district, in the taluks of Paramakudi, Sattur, Aruppukkottai, Mudukalatur and Ramnad. The black soil is more fertile than the red soil. Water is generally the limiting factor in the cultivation of these soils. The distribution of soils in the taluks are given below:

Taluks	Wet		Dry	
	Black	Red	Black	Red
Srivilliputhur	7·0	2·0	64·0	27·0
Sattur	2·6	...	82·6	14·8
Aruppukkottai	22·2	3·4	56·2	18·2
Paramakudi	34·5	...	65·5	...
Tiruvadanai	24·0	...	76·0	...
Mudukalatur	...	...	37·4	62·6
Sivagangai	...	37·8	...	62·2
Ramanathapuram	9·0	18·0	43·5	29·5

Malabar: The soils of Malabar are laterite and laterites. The rock formations of the district are granites and gnesses and these have been subjected to considerable leaching of 100 to 150" of rainfall in the South West Monsoon from June to September. Where the rainfall exceeds 100 inches per annum the soils are mainly laterites while with less than 100 inches lateritic soils of silica sesqin of 1·3 to 2 have developed. The soils are devoid of bases and not fertile except in Wynad taluk where black and blackish soils have developed from forest washes. The laterites are often coarse in texture with considerable ferruginous gravel but loams preponderate and occasionally clays are met with. Along the coast considerable yamounts of sand soils are found especially in Ponnani taluk. The distribution of the different types of soils in the taluks of the district are as follows. Wynad taluk has not been surveyed systematically.

Taluks	Red clay	Red Loam	Red sand	Arenacious
In 1000 of acres				
Kottayam	0·7	174·8	5·0	...
Chirakkal	7·6	370·7	35·1	...
Kurumbarnad	6·0	200·7	27·6	3·2

Taluks	Red clay	Red Loam	Red sand	Arenacious
Calicut	0·2	165·1	10·7	1·3
Ernad	2·0	363·3	31·4	0·1
Walluvanad	...	303·0	63·5	...
Palghat	...	280·9	31·5	...
Ponnani	10·1	99·9	126·9	11·6
British Cochin	...	...	0·7	0·3

South Kanara : The district is a broken table land of laterite soil, 200-400 feet near the coast rising to 600 feet near the western ghat. The strip of land varies in width from 5 to 25 miles between the Ghat and the sea. It contains numerous ravines and valleys of rich alluvial soil. The soils of the district are ferrunginous or areanaceous and have wet, dry and garden cultivation. The principal rock is quartzosegneiss which decomposes into white, yellow or red clay finally converted into laterite by the heavy rainfall and high summer temperature. The distribution of the soils is as follows :

Taluks In 1000 of acres	Ferruginous	Arenaceous
Mangalore	221·1	19·3
Kasargode	361·0	11·4
Puthur	607·2	...
Udupi	205·4	7·5
Gondapur	276·3	3·0
Karkal	340·7	...

Nilgiris : The district is a plateau rising abruptly from plains. The interior consists chiefly of gravelly undulating plains divided by narrow valleys. The soils are shallow in higher slopes and on the lower lands deep rich loams are found as well as yellow ochre clay and in some places black peaty soils. The soils are subject to much inundation. There are four varieties of soils distinguished as black, brown, yellow and red. Level lands with black and red soils are fit for cultivation. High slopes are not suitable for ordinary crops but are much in demand for tea plantations. The major soils the district are laterites.

Summary : In this paper the distribution of soils as classified by the Revenue authorities are given for each district comprising the State and for the taluks of a district. The soils are classified mainly into black, red and arenacious soils. Nothing has been said about the nature of the soils, their properties and characteristics. Detailed information on these aspects will be presented in subsequent papers.

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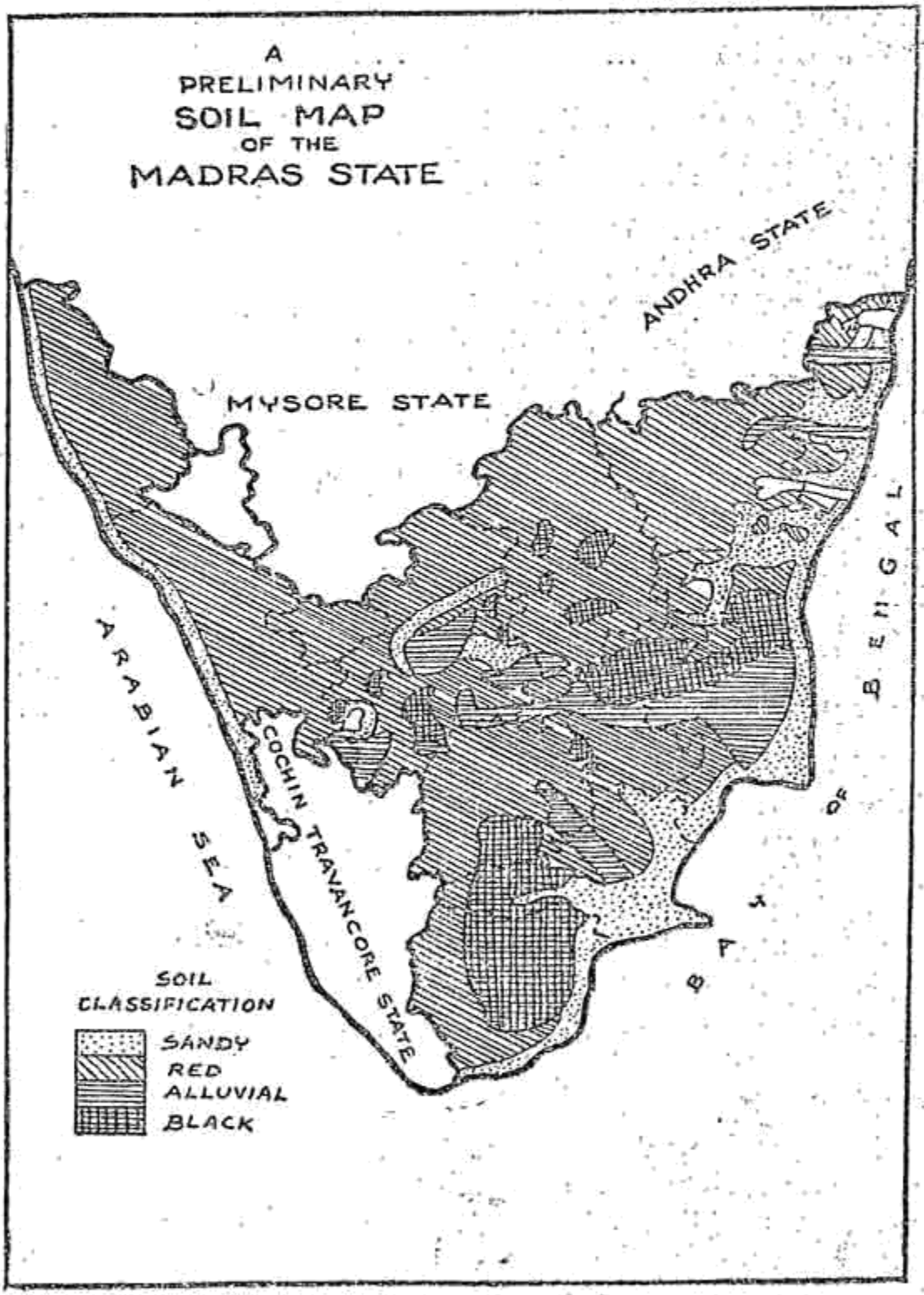

The Soil Map of Madras State as in 1955 is appended.