

ORDINARY, MS

Public DEPARTMENT.
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[Despatch Abstract].

Improvement of the present
system of rainfall registration.

13 OCT 50
The Rev: Dept.
- Mob: Rep.
The Revenue Sec: 10/1/50

Madras—contd.

Rainfall Divisions.	Districts.	Stations.
MADRAS SOUTH CENTRAL— <i>contd.</i>	Salem— <i>contd.</i>	Dharmapuri.
		Haroor.
		Hosur.
		Krishnagiri.
		Namakal.
		Omair.
		Paramathy.
		Pennagaram.
		Rajapuram.
		Salem.
		Sankaridrug.
		Shevaroy Hills.
		Tiruchengod.
		Tirupatur.
		Uttankarai.
		Vaniyambadi.
	Coimbatore	Aravakurchi.
		Avanashi.
		Bhavani.
		Coimbatore.
		Dharapuram.
		Erode.
		Kangyam.
		Karur.
		Kollegal.
		Mettupalaiyam.
		Palladam.
		Perundurai.
		Pollachi.
		Satyamangalam.
		Talavadi.

Madras—contd.

Rainfall Divisions.	Districts.	Stations.
MADRAS SOUTH CENTRAL— <i>contd.</i>	Coimbatore— <i>contd.</i>	Udamalpet.
		Coonoor.
		Devala.
		Gudalur.
		Kaity.
		Kodanad.
		Kondahs.
		Kotagiri.
		Naduvattam.
		Ootacamund.
MADRAS HILLS	Nilgiris	Oykara.
		Wellington.
		Badvel.
		Chitvel.
		Cuddapah.
		Jammalamadugu.
		Kadiri.
		Kamalapuram.
		Madanapalle.
		Piler.
MADRAS CENTRAL	Cuddapah	Proddutur.
		Pulivendla.
		Pullampet.
		Rayachoti.
		Siddhavattam.
		Vayalpad.
		Anantapur.
		Bukkapatnam.
		Dharmavaram.
		Gooty.
	Anantapur	Hindupur.
		Kalyandrug.

Madras—contd.

Rainfall Divisions.	Districts.	Stations.
MADRAS CENTRAL—contd. ...	Anantapur—contd. ...	Madakasira. Penukonda. Tadpatri. Uravakonda. Yadaki.
	Bellary ...	Adoni. Alur. Bellary. Harpanahalli. Hospet. Huvinahadgalli. Kampli. Kudligi. Rayadrug. Siruguppa. Yemmiganur.
	Kurnool. ...	Atmakur. Cumbum. Kalva. Koilkuntla. Kurnool. Markapur. Nandikotkur. Nandyal. Owk. Pattikonda. Pyapali. Ramalla Kot. Sirvel.

G. C. Press, Simla,—No. 363 B. & A. D.—1-9-90,—100.

Madras—contd.

Rainfall Divisions.	Districts.	Stations.		
EAST COAST (SOUTH)—concl'd.	Trichinopoly—cont'd....	Kilpaluvur.		
		Kulitalai.		
		Lalgudi.		
		Manaparai.		
		Musiri.		
		Perambalur.		
		Trichinopoly.		
		Turaiyur.		
		Dindigul.		
		Kodaikanal.		
		Madura.		
		Melur.		
		Morekulam.		
		Mutukulatur.		
		Muturagunathapatnam.		
		Nelakotta.		
		Oosilampatti.		
MADRAS SOUTH	Madura	Pamban.		
		Periyakulam.		
		Palni.		
		Ramnad.		
		Sivaganga.		
		Tirushuli.		
		Tirumangalam.		
		Tirupatur.		
		Uthamapoliem.		
		Vattanem.		
		Vedasendoor.		
		Ambasamudram.		
		Huzoor.		
		Nanguneri.		
		Otapidaram.		
			Tinnevelly	

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Rev. 600/90
18-6-90

Madras—contd.

Rainfall Divisions.	Districts.	Stations.
MADRAS CENTRAL—contd. ...	Anantapur—contd. ...	Madakasira. Penukonda. Tadpatri. Uravakonda. Yadaki. Adoni. Alur. Bellary. Harpanahalli. Hospet. Huvinahadgalli.
	Bellary ...	Kampli. Kudligi. Rayadrug. Siruguppa. Yemmiganur.
	Kurnool. ...	Atmakur. Cumbum. Kalwa. Koilkuntla. Kurnool. Markapur. Nandikotkur. Nandyal. Owk. Pattikonda. Pyapali. Ramalla Kot. Sirvel.

G. C. Press, Simla,—No. 363 E. & A. D.—1-9-90,—100.

Madras—contd.

Rainfall Divisions.	Districts.	Stations.
EAST COAST (CENTRAL) ...	Kistna ...	Bapatla. Bezvada. Gudivada. Guntur. Masulipatam. Nandigama. Narsaraopet. Nuzvid. Palnad. Repalle. Satlenapalle. Vissannapett. Vinukonda.
	Nellore ...	Atmakur. Darsi. Gudur. Iskapalle. Kandukur. Kanigiri. Kavali. Kistnapatam. Monapalem. Nellore. Ongole. Pakala. Rapur. Tada. Udayagiri. Venkatagiri.
EAST COAST (SOUTH) ...	Chingleput ...	Chingleput. Conjeeveram.

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Rev: 600/800
18-6-90

Madras—contd.

Rainfall Divisions.	Districts.	Stations.
EAST COAST (SOUTH)—contd.	Chingleput—contd.	Madurantakam. Ootramalur. Ponneri. Poonamallee. Saidapet. Sattivadoo. Sriperumbudur. Tiruvallur.
	North Arcot.	Arcot. Arkonam. Arni. Chandragiri. Chittoor. Gudiyatam. Kalabasti. Kangundi. Maderpank. Palmaner. Polur. Punganur. Putthoor. Tirupati. Tirutani. Vellore. Venkatagiri Kota. Walajapet. Wandiwash.
	South Arcot	Bhuvanagiri. Chengam. Chidambaram. Cuddalore. Gingee.

Madras.—contd.

Rainfall Divisions.	Districts.	Stations.
EAST COAST (SOUTH)—contd.	South Arcot—contd....	Kallakurchi. Mannargudi. Merkanam. Panruti. Tindivanam. Tirukoilur. Titagudi. Tiruvannamalai. Ulundurpet. Vanoor. Villupuram. Vriddhachalam.
	Tanjore ...	Arantangi. Kumbakonam. Mannargudi. Mayavaram. Mutupet. Nannilam. Negapatam. Nidamangalam. Patukota. Shiyali. Tanjore. Tiruturaipundi. Tiruvadi. Tiruvalur. Tranquebar. Vallam. Vederaniyam.
	Trichinopoly ...	Ariyalur. Illuppur. Jayankondacholapuram.

Madras—contd.

Rainfall Divisions.	Districts.	Stations.
EAST COAST (SOUTH)—concl'd.	Trichinopoly—cont'd....	Kilpaluvur. Kulitalai. Lalgudi. Manaparai. Musiri. Perambalur. Trichinopoly. Turaiyur. Dindigul. Kodaikanal. Madura. Melur. Morekulam. Mutukulatur. Muturagunathapatnam. Nelakotta. Oosilampatti. Pamban. Periyakulam. Palni. Ramnad. Sivaganga. Tirushuli. Tirumangalam. Tirupatur. Uthamapoliem. Vattanem. Vedasendoor. Ambasamudram. Huzoor. Nanguneri. Otapidaram.
	MADRAS SOUTH ... Madura ...	
	Tinnevelly ...	

Madras—contd.

Rainfall Divisions.	Districts.	Stations.
EAST COAST (NORTH)—concl'd.	Vizagapatam—concl'd.	Narsapatnam. Naurungapur. Paderu. Palkonda. Parvatipur. Pottungi. Rayagbada. Salur. Srungavarapukota. Vizianagrum. Waltair. Yellamanchili. Alamur. Amalapuram. Bhadrachalam. Chintalapudu. Cocanada. Coringa. Ellore. Kottapeta. Narsapur. Peddapuram. Pentapadu. Pithapuram. Polavaram. Prattipadu. Gokavaram. Rajahmundry. Ramachandrapuram. Sivakodu. Tanuku. Tuni. Tallapudi.

Madras.

Rainfall Divisions.	Districts.	Stations.
EAST COAST (NORTH)	Ganjam	Aska.
		Balliguda.
		Berhampore.
		Calingapatam.
		Chatrapur.
		Chicacole.
		Gopalpur.
		Ichapur.
		Narsannapet.
		Pattupore.
		Pundi.
		Parlakimedi.
		Purushottapur.
		Rambah.
		Russellkonda.
		Sompet.
		Surada.
		Tekkali.
		Udayagiri.
	Vizagapatam	Anakapalle.
		Balachervu.
		Bimlipatam.
		Bobbili.
		Chipurupalle.
		Chodavaram.
		Gajapatinagar.
		Gudem.
		Gunipur.
		Jeypore.
		Koraput.
		Kuppili.
		Malkangiri.

Subd. 699
18-10-20

Madras.

Rainfall Divisions.	Districts.	Stations.
EAST COAST (NORTH)	... Ganjam	Aska. Balliguda. Berhampore. Calingapatam. Chatrapur. Chicacole. Gopalpur. Ichapur. Narsannapet. Pattupore. Pundi. Parlakimedi. Purushottapur. Rambah. Russellkonda. Sompet. Surada. Tekkali. Udayagiri.
	Vizagapatam	Anakapalle. Balacheruvu. Bimlipatam. Bobbili. Chipurupalle. Chodavaram. Gajapatinagar. Gudem. Gunipur. Jeypore. Koraput. Kuppili. Malkangiri.

1890.

GOVERNMENT OF INDIA.
REVENUE AND AGRICULTURAL DEPARTMENT.

METEOROLOGY.



FILE NO. 3
SERIAL NO. 19

RESOLUTION.

To

Circular No. $\frac{6}{3-19}$ Met.

Dated Simla, the 29th August 1890.

SUBJECT.

Improvement of the present system of rainfall registration throughout India.

[W. F. C.]

Extract from the Proceedings of the Government of India in the Revenue and Agricultural Department (Meteorology), dated Simla, the 29th August 1890.

READ again—

Letter from the Meteorological Reporter to the Government of India No. 520-S, dated 5th October 1889.

Circular to the Local Governments and Administrations, No. 77—1-54, dated 24th October 1889, with endorsement to the Foreign Department of the same No. and date.

Read—

The following replies to the Circular of 24th October 1889.

From the Chief Commissioner, Central Provinces, No. 1595—107-S, dated 3rd December 1889.

From the Chief Commissioner, Assam, No. 2041-G-R, dated 18th December 1889.

From the Chief Commissioner, Coorg, No. 1945—648, dated 24th December 1889.

From the Foreign Department, No. 4874, dated 28th December 1889.

From the Government of the North-Western Provinces and Oudh, No. 22—1-824, dated 6th January 1890.

From the Government of Bombay, No. 121, dated 9th January 1890.

From the Foreign Department, No. 347-I, dated 30th January 1890.

From the Foreign Department, No. 612-I, dated 19th February 1890.

From the Punjab Government, No. 40, dated 25th February 1890.

From the Foreign Department, No. 699-I, dated 27th February 1890.

From the Government of Bengal, No. 1020—107, dated 17th March 1890.

From the Foreign Department, No. 1063-I, dated 27th March 1890.

From the Chief Commissioner, Ajmere and Merwara, No. 926-S, dated 28th March 1890.

From the Foreign Department, No. 1192-I, dated 14th April 1890.

From the Foreign Department, No. 1243-I, dated 18th April 1890.

From the Government of Madras, No. 247, dated 31st March 1890.

From the Secretary for Berar to the Resident, Hyderabad.

From the Chief Commissioner, Burma, No. 95—6-G, dated 6th May 1890.

From the Foreign Department, No. 1706-I, dated 22nd May 1890.

Read also—

Letter from the Meteorological Reporter to the Government of India, No. 203—S, dated 15th May 1890.

RESOLUTION.

In addition to the rain gauges attached to Meteorological stations under the supervision of the Imperial Meteorological Department rainfall is registered at a large number of stations in each province for local purposes. The information collected is published in various forms and is also to some extent utilized in the preparation of the weekly memoranda on the weather which appear in the *Gazette of India*. Registration at these provincial rainfall stations (as they may be termed) is not, however, conducted on a uniform system: the

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gauges used are of different patterns; the sites selected are sometimes defective; inspection is not everywhere regular and, in most provinces, the results are not critically examined. Owing to these causes readings are not always reliable and the data collected though available in a scattered form, are not easily accessible to the public.

2. Having regard to the many important interests, public and administrative, served by an accurate record of the rainfall of the country the Imperial Meteorological Reporter, with the concurrence of the Government of India, formulated certain proposals for improving the provincial registration of rainfall and bringing it into harmony with the system adopted at the Imperial Meteorological stations. These proposals were circulated for the consideration of Local Governments and Administrations last October, and the replies, which His Excellency the Governor General in Council is glad to observe are almost unanimously in favour of the measures suggested, have been communicated to the Meteorological Reporter who now submits his final recommendations on the subject.

3. The first proposal is that, in order to facilitate comparison and reduce the labour of compilation, rainfall should be registered at a common hour, *viz.*, 8 A.M., and that a common week ending 8 A.M. on Saturday should be adopted throughout India for all rainfall returns. His Excellency the Governor General in Council sanctions these measures, and they may be brought into force at once. The hour suggested has already been almost universally adopted since May last, and there is a general agreement regarding the advisability of prescribing a common week. The acceptance of this latter proposal does not imply any alteration of the existing arrangements for the weekly report on crops and weather telegraphed to the Government of India, nor is it intended to impose on Local Governments and Administrations the publication of any additional returns; but whenever weekly statements are compiled or published they should conform to the period now prescribed.

4. The necessity for inspection of rain gauges is generally recognized and in several provinces orders appear to be in force providing for their inspection by local officers. But the Government of India is unable from the information supplied to gather the extent to which supervision is exercised over the performance of this duty, and it seems probable that in some districts it is not systematically carried out. It is proposed that the Meteorological Department should issue a brief set of rules or instructions for the inspection of rain gauge stations and forms on post cards in which the results of inspection could be briefly reported. To these proposals the Government of India has no objection. The Meteorological Reporter should prepare the instructions as soon as convenient and forward copies for distribution to Local Governments and Administrations, who may consider it desirable to issue editions in the vernacular for the use of the subordinate native officials who themselves register or supervise the registration of rainfall. As regards the submission of inspection reports, it is suggested that one copy should be sent to the Meteorological Reporter to the Government of India on the occasion of each inspection, and that he be empowered to offer suggestions upon points brought to notice in the reports. It is not proposed that he should correspond with inspecting officers. But it will probably be convenient that a duplicate inspection report be submitted to the officer charged with the collection and publication of rainfall data for the whole Province where such an officer exists, and, in the absence of objection by the Local Government or Administration, and to save time, the Reporter might be permitted to address his suggestions to this officer direct. The Government of India would prefer this arrangement wherever it is acceptable to Local Governments, but so long as an efficient system of supervision is maintained, it is content to leave to their discretion the adoption of any other plan which may be considered suitable.

5. Uniformity of gauge is an essential requisite for obtaining accurate data and there is a general consensus of opinion in favour of the instrument recommended by the Meteorological Reporter, *viz.*, the Symons rain-gauge. Considerable progress is reported to have been made already in the introduction of this pattern, and the Government of India desires to see its substitution for the less efficient

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float-gauges wherever these are still in use. It is strongly recommended by the Meteorological Reporter that all gauges should be obtained through the Meteorological Department, by which they would be carefully tested before issue. No inconvenience is, the Government of India believes, likely to result from this measure which is accordingly sanctioned. The Meteorological Reporter will frame rules for the supply of rain-gauges for the approval of Government.

6. In regard to the publication of rainfall data it appears that returns either weekly or monthly or both are regularly published in the Provincial Gazettes in different forms suited to local requirements. These returns will not be interfered with; but the Meteorological Reporter urges the desirability of publishing a complete collection of the rainfall data for India in an annual volume admitting of easy reference for the use of officers and others interested in accurate rainfall statistics. It is pointed out that while the present methods of publication may suffice for ordinary current wants, the returns are too scattered and incomplete for the purposes of comparison and the discussion of questions connected with the distribution of rainfall; they are not readily accessible to students of Meteorology and when required for engineering or other schemes involving an investigation of rainfall must be compiled at considerable trouble and expense. It has been found moreover that the materials for such compilations are not always forthcoming owing to the destruction of the original records. The labour of preparing and publishing an annual return for the whole of India in the Imperial Meteorological Office would, however, add largely to the work and expenditure of that Department, and, while recognizing the importance of the suggestion, the Government of India hesitates to impose this large additional burden on the Meteorological Reporter. This officer suggests that in addition to weekly rainfall statements all Local Governments should also publish complete monthly statements in the appended form which is modelled on that already in use in Bengal. The form will cover one or more pages of foolscap, and will be suitable for binding into the local Gazettes as well as into the proposed annual volume. In order to assist Local Governments and Administrations in filling in the first three columns of the statements, lists are enclosed showing the various rainfall divisions now exhibited in the weekly maps published by the Department together with the districts and stations at present included in each division. Should any station be added to or expunged from the list by any Local Government, the alteration will be shown at its proper place in the Provincial List. It will also be convenient that intimation of all such alterations should be separately given to the Meteorological Reporter direct. The Reporter also should be informed without delay of any changes that may take place in the head quarter stations of districts. The columns "average rainfall for the month," and "average number of rainy days" will be filled in from data furnished by the Imperial Meteorological Office. The columns 40 and 41 will be inserted or omitted and, if inserted, the periods for them may be chosen at the discretion of Local Governments. Each Government would send to the Meteorological Reporter to the Government of India after publication of each statement a fixed number of copies, and the whole would be bound up into annual volumes and distributed to those officers and foreign recipients of Meteorological publications who take special interest in rainfall data. His Excellency the Governor General in Council accepts these suggestions and trusts that they will meet with the concurrence of Local Governments. In the case of Kashmir, Rajputana, Central India and Baluchistan the monthly statements will be forwarded in manuscript by the Provincial Officers concerned and printed by the Imperial Meteorological Department.

7. Two other proposals remain to be considered, the first relating to the division of the year into periods corresponding with the principal agricultural seasons, and the second to the definition of a rainy day.

As was anticipated, it has been found impracticable to make a division of the year which would be satisfactory for the whole of India. It will therefore be left for Local Governments to prescribe for provincial returns any divisions which may be considered best adapted to local wants. For the discussion of rainfall in the Simla daily and weekly reports and the annual report on the Meteorology

of India, the following divisions based on the four best marked periods of general rainfall in India, will be adopted :—

- 1st.—January 1st to 28th February, winter or cold weather rains, chiefly in Upper and Central India.
- 2nd.—March 1st to 31st May, the hot weather or spring rains of Bengal and Assam.
- 3rd.—June 1st to 15th October, the south-west monsoon rains.
- 4th.—October 16th to 31st December, the retreating south-west monsoon rains of the Peninsula.

In order to avoid breaking weeks of rainfall-registration, each of the periods will actually end upon the Saturday and begin upon the Sunday nearest to the dates above specified.

8. With regard to the necessity for the definition of a "rainy day" the Meteorological Reporter remarks that from an agricultural point of view it is not only necessary to know the total amount of rain but also the character of the rainfall. It is evident that a rainfall of 20 inches during a given period in two or three cyclonic downpours might be destructive to the crops, whilst the same amount occurring as frequent moderate showers in the same period might be beneficial in the highest degree. The only fairly satisfactory way of discriminating the character of the fall is by comparing the actual number of rainy days with the normal number, and the starting point for such a comparison will be a suitable definition of a rainy day. The Meteorological Departments of other countries have generally adopted a rainfall of '01" or upwards in twenty-four hours as defining a rainy day, and this has been followed in the Annual Reports on the Meteorology of India. A fall of '01" however appears to be too small to be of any value for agricultural purposes in this country. The knowledge of such a fall might be a useful indication of the prevalence of cloudy weather which is sometimes very desirable for the crops at certain periods. But the comparison usually desired appears to be between the actual number of days on which useful or heavy rain fell and the normal number of such rainy days; and the Government of India concurs with the Meteorological Reporter that a fall of '1" (one-tenth of an inch) in twenty-four hours will be the most convenient and suitable definition.

9. The proposals for the improvement of rainfall registration which have the approval of the Government of India may now be summarized.

- 1st.—That a common hour for registration, *vis.*, 8 A.M., and a common rainfall week ending on Saturday 8 A.M. should be adopted in the whole of India.
- 2nd.—That all rain-gauges should be *systematically* inspected, the services of the Meteorological Reporter to the Government of India being utilized for supervision of the duty of inspection wherever this is considered desirable.
- 3rd.—That Symons rain-gauges, tested by the Meteorological Department, should be the only description of gauge used.
- 4th.—That monthly returns of rainfall be published by each Local Government, of which copies would be bound together and issued as an annual volume by the Imperial Meteorological Department.
- 5th.—That the Imperial Meteorological Department should adopt a fixed division of the year into four periods corresponding with the periods of general rainfall for purposes of comparison.
- 6th.—That for the purpose of calculating the number of rainy days a fall of one-tenth of an inch and upwards be taken to denote a rainy day.

ORDERED—That copies of this Resolution be forwarded to the Local Governments and Administrations noted in the margin, and the Meteorological Reporter to the Government of India, for information and guidance, and to the Foreign Department for favour of communication to the Political authorities in the Native States concerned, also that the Resolution be published in the Supplement to the *Gazette of India*.

Madras.
Bombay.
Bengal.
North-Western Provinces and Oudh.
Punjab.

Central Provinces.
Burma.
Assam.
Ajmere.
Coorg.
The Resident at Hyderabad.

the Foreign Department for favour of communication to the Political authorities in the Native States concerned, also that the Resolution be published in the Supplement to the *Gazette of India*.

Ordered also that a copy be forwarded to the Public Works Department for information.

[True Extract]

J. W. Bennett
Offg. Secretary to the Government of India.

To
The Secretary to the Govt. of Madras.

With 50 S.C. of Circulars & forms
sent by Post