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*New rainfall series for
the districts, meteorological
sub-divisions and
country as whole of India*

*P. Guhathakurta,
A. L. Koppa,
Usha Krishnan
and
Preetha Menon*

NATIONAL CLIMATE CENTRE
OFFICE OF THE
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INDIA METEOROLOGICAL DEPARTMENT
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**New rainfall series for the districts,
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P. Guhathakurta, A. L. Koppar, Usha Krishnan, Preetha Menon

pguha@indpune.gov.in



**National Climate Centre
India Meteorological Department
PUNE, INDIA
411005**

ncc@indpune.gov.in

Executive Summary

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16	Abstract	India Meteorological Department is maintaining and regularly updating the oldest rainfall series (1875- till date for the country as a whole and for the meteorological subdivisions. This data utilizes by a wide variety of community for different application. So far there is no such series for the districts of the country. The present report discusses the new rainfall series of all available districts form 1901 to till date. Also the subdivision and all India series are generated from the district series. The report gives the detail information regarding the number of stations and districts for every year for which data are generated. It also compares the series with the available series of the department.
17	Key Words	Rainfall data series, districts, subdivisions.

1. Introduction

India Meteorological Department (IMD) after its establishment in 1875, took initiative to install more and more rain-gauges around the country to capture the complex variation of rainfall across the country. India Meteorological Department collects rainfall data of all the rain-gauge stations from all over the country, and then scrutinizes, processes and finally archives at National Data Centre, Pune. IMD also prepares different rainfall data products. Blanford (1886) the first head of the India Meteorological Department took personal effort to collect rainfall data from all the provinces and had brought out the detailed analysis of rainfall pattern over India. His work is well referred and is recognized as the most valuable information on rainfall distribution over India. Due to these efforts of IMD, a long time series of rainfall data from a fairly uniform network of stations is available for research work. These rainfall data is available for 36 meteorological subdivisions and all India starting from 1875 onwards. Many researchers used these precious data for examining the spatial and temporal variation of rainfall across the country.

1.1 *Status of existing rainfall series of India Meteorological Department*

Rainfall data of around 9000 rain-gauge stations of variable period are available at the National Data Center of India Meteorological Department. These data are being received at Hydrology division of India Meteorological Department, Pune from departmental observatories as well as different state Rainfall Registration Authorities. At present rainfall data of around 7500 rain-gauge stations are being received. The monthly rainfall series (1875-1991) of meteorological subdivisions are available at India Meteorological Department is based on the simple arithmetic mean of monthly rainfall values of the concerned rain-gauge stations within the each sub-division.

In order to accommodate larger demands from the state authorities, India Meteorological Department has started District Rainfall Monitoring Scheme (DRMS) initially from 1989 for only the southwest monsoon season and later from 1992 round the year. Monthly rainfall series for each Subdivision and also all India is available from 1992 onwards using the DRMS stations data which are varying around 2000 to 2500 stations. However different methodologies are used for this data series. Simple arithmetic mean was used to compute districts rainfall. For subdivision rainfall arithmetic mean of districts rainfall was used up to the year 2004. From 2004, for getting

subdivision rainfall, area weighted method of district rainfall is being used till date. The series from 1992 to 2010 is prepared on near real time and is based on the DRMS data of lesser number of stations than the prior values.

Thus the subdivision rainfall series 1875-2010 is not based on the uniform methodology and also not on uniform number of stations. However it is difficult to have a long series of data of uniform number of station to represent more than 600 districts of the country but it is possible to have rainfall series based on uniform methodology.

An effort was made to construct homogeneous rainfall series using uniform number of stations by Guhathakurta and Rajeevan (2006). This data series is based on 1476 stations and is from 1901-2003 and used 458 districts. This data series is not updated further.

1.2 *Need for the new series*

There is a large demand from different users for long term data series for every district and the country. Variable number of stations as well as variable methods of computations were used for the present data series for subdivisions and all India (1875-2010). For the analysis of variability of rainfall in districts or subdivision scale it is extremely necessary to have good data series. It is also necessary for developing empirical based rainfall forecast models for sub-divisions, homogeneous regions and country as a whole.

2. Data and methodology

Monthly rainfall data of 6926 stations for the period 1901 to latest are taken from the archival of National Data Center of India Meteorological Department. The data available for all the stations are of variable periods.

India Meteorological Department has recently updated the rainfall normal (1951-2000) and rainfall monitoring are now done for 641 districts. All the raingauge stations are therefore reallocated to represent all these new districts. Monthly rainfalls of all the districts are then computed by arithmetic mean of the available stations in the concern district of individual year. The availability of data for the first half of the 20th century is very poor for Arunachal Pradesh. Data series could be prepared for most of

the districts of this state from the year 1965-66 with only exception for Changlang district and East Siang district. Year-wise number of stations for which data were used to compute the district values is also made (not shown).

From the district rainfall series so constructed, subdivision rainfall series for all the months, seasons and annual are constructed using the district area weighted method. Finally all India rainfall for all the months, seasons and annual are computed using the area weighted method from the subdivision values.

3. Result and Analysis

3.1 Details about the new rainfall series

Table 1 shows the information regarding the district rainfall series that has been computed for the different years starting from 1901. Availability of the district data and also missing years for each state in the final rainfall series is shown. The availability of data for the first half of the 20th century is very poor for Arunachal Pradesh. Data series could be prepared for most of the districts of this state from the year 1965-66 with only exception for Changlang district and East Siang district. Andhra Pradesh is categorized as the best state where district series can be prepared for all the years from 1901 to 2005-06 except 3 years missing for the district Adilabad, 4 years missing for the district Karimnagar, 2 year missing for the district Vizaynagaram and 1 year missing for the district Medak. Year-wise number of stations for which data were used to compute the district values are also made (not shown). District series can be prepared up to the year 2009 for the two states viz. Uttar Pradesh and Kerala. Other states having good data availability are Goa, Tamilnadu and Rajasthan.

Table 2 shows the year wise number of district used for each of the 36 meteorological subdivisions while Table 3 displays the number of stations used for each year to get the subdivision values. Fig.1 shows the location. Number and name of the 36 subdivisions. For the subdivision Rayalseema, rainfall data series is made available for all the four districts for all the year from 1901 to 2006 without any missing year. Similarly for coastal Karnataka, all the three districts data are made available from 1901 to 2003 and for Madhya Maharashtra all the 10 districts data are made available from 1901-2004. The availability of district data is reasonably good for all the meteorological subdivisions also up to the year 2004-2005.

Figures 2 and 3 represent the number of stations and districts for the country as a whole for which the data can be made available against the individual year starting from 1901 to 2009. There is significant decrease in the number of stations and also number of districts after 2003-04. Number of stations has declined from 4325 in 2003 to 3426 in the year 2004 and it decreased to 2123 in 2005. As a result the number of districts for which monthly rainfall values has been computed from 535 in 2003 to 515 in the year 2004 and 440 in 2005. The values are very poor in the subsequent years.

There are many reasons for poor data availability in the recent years. One reason is the delay in receipt of rainfall data from the state authorities. However as mentioned earlier rainfall data of around 2500 raingauges stations including state raingauges are being received separately in near real time and monthly values of districts and subdivisions are available in the archive. These monthly values for the districts, sub-divisions and country as a whole can be considered for the recent 5-6 years as a near real time data and can be replaced their after once data from all the state raingauge stations received in delayed mode.

3.2. *Comparison of the new rainfall series with the existing rainfall series of IMD*

As mentioned earlier, there is no uniform methodology used for computation of the existing subdivision and all India monthly rainfall series of IMD. Prior to the year 2002, for computation of monthly rainfall of particular subdivision, simple arithmetic mean of all stations available at the time of computation was used. Also from 1992 to 2010, computation was made on near real time basis and thus less number of stations (around 2000-2500) is used. Also there is no long series of district monthly rainfall series available. Only available district rainfall series in IMD is from 1992 which also has been computed using near real time data and thus having less number of stations.

Present series gives monthly rainfall series of on an average 544 districts/year are computed based on an average 3116 number of stations/year of the country. For computation of subdivision values, district area weighted method is used over the complete period (1901-2009).

Table 4 presents the comparative descriptive statistics between the new series and existing series of all India rainfall based on the data period 1901-2005. The reason for selecting this period is that from 2006 onward the data availability is very poor and it

will not be practical to compare in this period. This will help in providing the information on the statistics of the existing rainfall series as well as the new rainfall series and also how the new series is varying with the existing one. Second and third columns of Table 4 give the mean rainfall for the IMD series and the new series for all the months, seasons and annual. The differences between the two series are very less. We have also performed two well known statistical test viz. student's t test and z test to see if there is any difference between the means.

The null hypothesis in this case is

H₀: The difference between the means is equal to 0.

Against the alternative hypothesis

H_a: The difference between the means is different from 0.

As the computed p-value is greater than the significance level $\alpha=0.05$, one cannot reject the null hypothesis H₀.

This is done separately for all the months, seasons and annual and the result of the test is same for all.

There is hardly any difference in median values but there exists some differences in the mode values for some months and seasons. Mode is the value that occurs most frequently in a [data set](#). The differences are noticed for the month of April-August, November and December and for the seasons Jan-Feb and Oct-Dec. This is because of that the new series is based on more number of stations than the existing series and also there is difference in the methodology of computation. The last four columns of Table 4 are very important as they show whether the new series has caused shifting in extreme values and corresponding year of the all India rainfall from the existing one. Highest and lowest monthly rainfall values during the period 1901-2005 and the corresponding year of occurrence are shown. Except for the month of December and the winter season (Jan-Feb) there is no change in the year of occurrences of maximum values. Maximum southwest monsoon rainfall of 1122.8 mm present in the existing series in the year 1917 has changed to 1084.3mm in 1917 in the new series. Compare to maximum rainfall there are more changes in the year of occurrence of minimum rainfall. This change is noticed for the month of January, April, August and December and for annual. This table brings another important feature. Though mean monthly rainfall is highest for the month of July and lowest for the month

of December, maximum monthly rainfall value is highest in July but lowest in February, the second lowest is January. The lowest value in minimum monthly rainfall is for December and highest value in minimum monthly rainfall is August not the July month.

4. Conclusions

For the first time long rainfall series for districts of the country from the year 1901 are made available. There are great demands from the users and particularly state authorities to have long series of district rainfall data for their regions. Also a better and uniform methodology is used for the computation of the new rainfall series. The limitation of the new series is the low number of stations used for the computation of rainfall for the recent years. The series uses the rainfall data of all the raingauge stations of the country that received in delayed mode. Thus there is a data gap for 4-5 years in the archive. However the rainfall values used by IMD for districts, subdivisions and all India based on near real time data under District Rainfall Monitoring Scheme (DRMS) using around 2500 stations are available on near time basis.

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S.N.	DISTRICT	AVAILABILITY	MISSING YEARS	S.N.	DISTRICT	AVAILABILITY	MISSING YEARS
				Andhra Pradesh			
1	ANJAW	1976-2006		1	ADILABAD	1901-2006	1923 -1925
2	CHANGLANG	1929-2006	1952 - 1965, 1967, 1970 - 1978	2	ANANTAPUR	1901-2006	
3	DIBANG VALLEY	1969-1986	1970 - 1975	3	CHITTOR	1901-2006	
4	EAST KAMENG	1966-2005	1967, 1970 - 1975	4	CUDDAPAH	1901-2006	
5	EAST SIANG	1916-2005	1952 - 1956, 1988, 1989	5	EAST GODAVARI	1901-2006	
6	KURUNG KUMEY	1966-1986	1967, 1970 - 1977, 1979, 1980	6	WEST GODAVARI	1901-2006	
7	LOHIT	1929-2006	1954 - 1970	7	GUNTUR	1901-2006	
8	LOWER DIBANG VALLEY	1969-1986	1970 - 1975	8	HYDERABAD	1901-2006	
9	LOWER SUBANSIRI	1965-1980	1978	9	KARIMNAGAR	1901-2006	1912 - 1915
10	PAPUM PARE	1966-2006	1967, 1970 - 1977, 1979, 1980, 1982, 1998	10	KHAMMAM	1901-2006	
11	TAWANG	1971-1972		11	KRISHNA	1901-2006	
12	TIRAP	1966-2004	1967, 1970, 1989, 1991 - 1996	12	KURNOOL	1901-2006	
13	UPPER SIANG	1966-1997	1967, 1970, 1975	13	MAHBUBNAGAR	1901-2006	
14	UPPER SUBANSIRI	1966-2006	1967, 1970, 1988 - 1992	14	MEDAK	1901-2006	1967
15	WEST KAMENG	1965-2006		15	NALGONDA	1901-2006	
16	WEST SIANG	1966-1986	1967, 1970	16	NELLORE	1901-2006	
				Assam			
1	CACHAR	1901-2006		17	NIZAMABAD	1901-2006	
2	DARRANG	1901-2005	1988, 1989, 1990	18	PRAKASAM	1901-2006	
3	GOALPARA	1901-2006		19	SRIKAKULAM	1901-2006	
4	KAMRUP	1901-2006	1958, 1960 - 1965, 1968 -1973	20	VISAKHAPATNAM	1901-2006	
5	LAKHIMPUR	1901-2006		21	WARANGAL	1901-2006	
6	N.C. HILLS	1901-2006	1986 -1990	22	RANGAREDDY	1901-2005	
7	NOWGONG	1901-2006		23	VIZIANAGARAM	1901-2005	1985, 1986
8	SIBSAGAR	1901-2006	1970, 1988 -1990	Chhatisgarh			
9	BARPETA	1901-2006	1953, 1955, 1958, 1960 1961 -1965, 1969 -1972, 1974, 1975	1	BASTAR	1910-2006	
10	DHUBRI	1901-2005	1970	2	BILASPUR	1901-2006	
11	DIBRUGARH	1901-2006	1958, 1960 - 1965, 1967 -1968 1971,1973, 1974, 1980, 1986, 1988, 1989, 1990	3	DANTEWARA	1939-1999	1960,1969-1971
12	JORHAT	1901-2006	1970	4	DHAMITARI	1901-1999	1970, 1971, 1981, 1982
13	KARBI ANGLONG	1953-2006	1954, 1958, 1960 - 1972, 1974	5	DURG	1901-2006	2001- 2004
14	KARIMGANJ	1901-2002	1958, 1960 -1965, 1967 -1968 1971,1973, 1974, 1980, 1986, 1988, 1989, 1990	6	JANIGIR	1902-2006	2000 -2004
15	KOKRAJHAR	1901-2006	1951, 1958, 1960 -1965, 1969, 1970, 1972 - 1980	7	JASHPURNAGAR	1901-2006	2000
16	SONITPUR	1901-2006	1915, 1917, 1944	8	KANKER	1927-2003	
17	NALBARI	1903-2006	1957 -1971	9	KORBA	1901-1999	1971
18	BONGAIGAON	1978-2006	2003 - 2005	10	KOREA	1913-1999	1959, 1969 - 1972,1983
19	MORIGAOON	1976-2006		11	KOWARDHA	1902-1999	1960,1964-1967,1970,1984
20	GOLAGHAT	1901-2006	1963, 1971, 1973 - 1975	12	MAHASAMUND	1902-1999	1969 - 1972 1981, 1982
21	TINSUKIA	1901-2006	1953, 1962, 1963, 1976	13	RAIGARH	1901-2006	
22	DHEMAJI	1979-2002	1988 - 1990	14	RAIPUR	1901-2006	2003
23	HAILAKANDI	1901-2006	1958, 1960 - 1970,1972 - 1978, 1980, 1981	15	RAINANDGAON	1902-2004	
24	UDALGURI	1901-2004	1960, 1983, 2003	16	SURGUJA	1901-2006	
25	BAKSA	1901-2006	1970, 1971, 1973, 1977	17	BIJAPUR	1939-1999	1960, 1961, 1969 - 1971
26	CHIRANG	1981-2006	1988 - 1990, 1994	18	NARAYANPUR	1939-2000	1961, 1969, 1970, 1971
27	KAMRUP METROPOLITAN	1902-2005	1910, 1942, 1945, 1982, 1984				

Table 1. Availability of data of the districts and also missing years for different states (Contd.)

S.N.	DISTRICT	AVAILABILITY	MISSING YEARS	S.N.	DISTRICT	AVAILABILITY	MISSING YEARS
	Bihar				Goa		
1	ARARIA	1901 - 2006		1	NORTH GOA	1901-2006	
2	ARWAL	1901 - 2006	1971,1973,1977-1985,1987-1988,1990	2	SOUTH GOA	1901-2006	
3	AURANGABAD	1901 - 2006	1971-1973		Gujarat		
4	BANKA	1901 - 2006	1971-1973,1982-1985	1	AHMEDABAD	1901-2006	
5	BEGUSARAI	1901 - 2006	1952,1971-1973	2	AMRELI	1901-2006	
6	BHABUA	1901 - 2006	1971	3	BANASKANTHA	1901-2006	
7	BHAGALPUR	1901 - 2006		4	BARODA	1901-2006	1920
8	BHOJIPUR	1901 - 2006	1990	5	BHAUNAGAR	1901-2006	
9	BUXAR	1901 - 2006	1924,1952,1971-1973	6	BROACH	1901-2005	2000
10	CHAMPARAN.EAST	1901 - 2006		7	BULSAR/VALSOD	1901-2006	1991, 1999, 2000
11	CHAMPARAN.WEST	1901 - 2006	1971-1973	8	DANGS	1903-2003	
12	DARBHANGA	1901 - 2006		9	JAMNAGAR	1901-2006	
13	GAYA	1901 - 2006		10	JUNAGADH	1901-2006	
14	GOPALGANJ	1901 - 2006	1971, 1973	11	KAIRA/KHEDA	1901-2005	2000
15	JAHANABAD	1901 - 2006	1951, 1953, 1971-1973, 1977-1978, 1982-1985,1987-1988,1990	12	KUTCH	1901-2006	
16	JAMUI	1901 - 2006	1971-1972	13	MEHSANA	1927-2005	1991, 2000
17	KATI HAR	1901 - 2006	1971-1973	14	PANCH-MAHALS	1901-2005	1991, 2000
18	KHAGARIA	1901 - 2006	1924,1927-1928, 1960,1971-1973	15	RAJKOT	1901-2006	
19	KISHANGANJ	1901 - 2006		16	SABARKANTHA	1901-2006	
20	LAKHISAROI	1964 - 2006	1971-1973	17	SURAT	1901-2006	
21	MADHEPURA	1901 - 2006	1935-1945,1952,1959-1960, 1971,1973	18	SUREDRANAGAR	1901-2003	1999, 2000
22	MADHUBANI	1901 - 2006	1971-1973	19	GANDHINAGAR	1974-2003	1979- 1990, 1998- 2000
23	MUNGER	1901 - 2006	1971-1973	20	ANAND	1901 - 2006	
24	MUZAFFARPUR	1901 - 2006		21	DOHAD	1901-2003	
25	NALANDA	1901 - 2006	1971, 1973	22	NARMADA	1901-2003	1997, 1999, 2000
26	NAWADAH	1901 - 2006	1971-1973	23	NAVSARI	1901-2003	1991, 1999, 2000
27	PATNA	1901 - 2006		24	PATAN	1901-2003	1991, 1998 -2000
28	PURNEA	1901 - 2006		25	PORBANDAR	1901 - 2006	
29	ROHTAS	1901 - 2006		26	TAPI	1901-2003	1969, 1991, 1999, 2000
30	SAHARSA	1901 - 2006	1971-1973		Himachal Pradesh		
31	SAMASTIPUR	1901 - 2006	1971-1973	1	BILASPUR	1954-2003	
32	SARAN	1901 - 2006	1971-1973	2	CHAMBA	1921-2003	1933 - 1943, 1949
33	SHEIKHPURA	1901 - 2006	1960, 1971-1973	3	KANGRA	1901-2005	
34	SHIBHAR	1976 - 2006	1977-1979	4	KINNAUR	1901-2005	1950
35	SITAMARHI	1901 - 2006	1963, 1971-1973	5	KULU	1901-2005	1963
36	SIWAN	1901 - 2006	1971-1973	6	LAHUL AND SPITI	1903-2005	1911 - 1932, 1945 - 1949
37	SUPAUL	1901 - 2006	1958	7	MANDI	1951-2005	
38	VAISHALI	1901 - 2006	1971-1973, 2003	8	HAMIRPUR	1901-2003	1966, 1969, 1978
	Delhi			9	SIMLA	1901-2005	
1	NEW DELHI	1901-2005	1980	10	SIRMUR	1951-2005	
2	CENTRAL DELHI	1941-2005	1951	11	SOLAN	1901-2005	
3	NORTH DELHI	1999-2005	2000	12	UNA	1901-2005	1953, 1960, 1963, 1966
4	NORTH WEST DELHI	1941-2001	1957, 1966 - 1970, 1972, 1974, 1975, 1989, 1990, 1999, 2000		Tripura		
5	SOUTH DELHI	2004-2005		1	NORTH TRIPURA	1938-2004	1954
6	SOUTH WEST DELHI	1964-2005	1969 - 1998	2	DHALAI	1956-2004	1984
7	WEST DELHI	1959-2005		3	WEST TRIPURA	1901-2005	
				4	SOUTH TRIPURA	1938-2004	1954, 1984

Table 1. Availability of data of the districts and also missing years for different states (Contd.)

S.N.	DISTRICT	AVAILABILITY	MISSING YEARS	S.N.	DISTRICT	AVAILABILITY	MISSING YEARS
Haryana							
1	AMBALA	1901-2005		1	BOKARO	1901-2005	1933
2	BHIWANI	1901-2005	1966, 1967, 1985, 1986, 1987, 1989	2	CHATRA	1901-2004	1971 - 1973
3	FARIDABAD	1901-2005	1966, 1967	3	DEOGHAR	1901-2006	1990
4	FATEHABAD	1901-2005	1966, 1967	4	DHANBAD	1901-2004	
5	GURGAON	1901-2005		5	DUMKA	1901-2006	
6	HISSAR	1901-2005		6	GARHWA	1902-2004	1971 - 1974, 1977 -1988
7	JHAJJAR	1901-2005	1966, 1967	7	GIRIDIH	1905-2006	
8	JIND	1901-2005	1950- 1953, 1961,1966 -1970	8	GODDA	1901-2004	1971 - 1973
9	KAITHAL	1901-2005	1966, 1967, 1987- 1989	9	GUMLA	1901-2004	1971 - 1973
10	KARNAL	1901-2005	1910	10	HAZARIBAGH	1901-2005	
11	KURUKSHTRA	1901-2005	1966, 1967, 1985, 1986, 1987, 1988, 1989	11	JAMTARA	1901-2004	1987
12	MAHENDRAGARH	1954-2005	1901- 1953, 1966	12	KHUNTI	1906-2004	1971 -1974
13	MEWAT	1901-2005	1966, 1967	13	KODARMA	1903-2004	1981 - 1985, 1988, 1990
14	PALWAL	1901-2005	1966, 1967,1985-1989	14	LATEHAR	1902-2005	
15	PANCHKULA	1951-2005	1901- 1950, 1963, 1966, 1967, 1970	15	LOHARDAGA	1901-2004	1971 - 1974
16	PANIPAT	1901-2005	1966, 1967	16	PAKUR	1901-2004	1971 - 1973 ,1977, 1978
17	REWARI	1901-2005	1966, 1967, 1989	17	PALAMAU	1901-2006	
18	ROHTAK	1901-2005	1966	18	RAMGARH	1901-2004	1907, 1959, 1971 - 1973
19	SIRSA	1901-2005	1952, 1966, 1967	19	RANCHI	1901-2006	
20	SONEPAT	1901-2005	1966, 1967,1985- 1989	20	SAHEBGANJ	1901-2004	1971 - 1973
21	YAMUNANAGAR	1901-2005	1962, 1964 ,1966- 1970	21	SERAIKELA	1901-2004	1971 - 1974
Jammu & Kashmir							
1	ANANTNAG SOUTH	1901-2004	1957	22	SIMDEGA	1901-2004	1901-2004
2	NORTH BARAMULLA	1901-2004		23	SINGBHUM EAST	1901-2006	
3	DODA	1911-2004	1951 - 1959	24	SINGBHUM WEST	1901-2006	
4	JAMMU	1901-2004		Kerala			
5	KATHUA	1901-2004	1957, 1963 - 1965, 1970 - 1978, 1980 - 1995	1	ALAPUZHA	1901-2009	2006
6	LADAKH	1901-2004	1985 - 1989, 1991 - 1997	2	CANNUR	1901-2009	2006
7	POONCH	1901-2002	1956 - 1960, 1963 - 1965, 1970 - 1980, 1983, 1984, 1987, 1988, 1990, 1991	3	ERNAKULAM	1901-2009	2006
8	REASI	1901-1993	1957, 1963, 1966, 1970 - 1983, 1986 - 1992	4	KOTTAYAM	1901-2009	2006
9	UDHAMPUR	1901-2004	1957, 1963 -1965, 1974	5	KOZHIKODE	1901-2009	2006
10	KULGAM	1962-2004		6	MALAPURAM	1901-2009	1987, 1988, 2005, 2006
11	BADGAM	1901-2003	1948 - 1958, 1984 -1989, 1995 - 1998	7	PALAKKAD	1901-2009	2006
12	KUPWARA	1916-2004	1957, 1989, 1991	8	KOLLAM	1901-2009	2006
13	PULWAMA	1901-2004	1949 - 1951, 1957, 1983 - 1993, 1995	9	THRISSUR	1901-2009	2005, 2006
14	SRINAGAR	1901-2004		10	THIRUVANANTHAPURAM	1901-2009	2006
15	RAMBAN	1901-1985	1957, 1958, 1959, 1961, 1963, 1964 ,1965, 1970 ,1971, 1973, 1976 - 1983	11	IDUKKI	1901-2009	2005, 2006
16	SHOPIAN	1960-1996	1968, 1986 - 1992	12	KASARGOD	1901-2009	1987, 2005, 2006
17	KISTWAR	1901-1962	1952 - 1960	13	PATHANAMTHITTA	1901-2009	1987, 2005, 2006
18	KARGIL	1908-2001	1945 - 1954, 1959 - 1965, 1967 - 1974, 1976 - 1997, 2000	14	WYNAD	1901-2009	1987, 2005, 2006
19	SAMBA	1901-1969	1957, 1963, 1964, 1965	Meghalaya			
20	BANDIPORE	1962-1994	1983 - 1992	1	EAST GARO HILLS	1976-1986	
				2	WEST GARO HILLS	1901-1997	
				3	EAST KHASI HILLS	1901-2005	
				4	WEST KHASI HILLS	1983-1997	
				5	JAINTIA HILLS	1901-2005	1958, 1960-1966,1969-1982
				6	RI BHOI	1960-2006	1962-1974,1978,1981-1984

Table 1. Availability of data of the districts and also missing years for different states (Contd.)

S.N.	DISTRICT	AVAILABILITY	MISSING YEARS	S.N.	DISTRICT	AVAILABILITY	MISSING YEARS
	Maharashtra				Karnataka		
1	AHMEDNAGAR	1901-2004		1	BAGALKOTE	1901-2005	
2	AKOLA	1901-2006		2	BANGALORE RURAL	1901-2002	1999
3	AMRAOTI	1901-2006		3	BANGALORE URBAN	1901-2005	
4	AURANGABAD	1901-2006		4	BELGAUM	1901-2005	
5	BHANDARA	1901-2005	1964, 1965	5	BELLARY	1901-2005	
6	BEEED	1901-2004	1941	6	BIDAR	1902-2005	1910, 1919 - 1922, 1928
7	BOMBAY CITY	1901-2006	1922	7	BIJAPUR	1901-2004	
8	BULDHANA	1901-2006		8	CHAMARAJNAGAR	1901-2003	1997
9	CHANDRAPUR	1901-2006		9	CHICKMAGALUR	1901-2005	
10	DHULIA	1901-2005		10	CHITRADURGA	1901-2005	
11	JALGAON	1901-2006		11	DAVANAGERE	1901-2003	
12	RAIGARH	1901-2006		12	DHARWAR	1901-2003	
13	KOLHAPUR	1901-2006		13	GADAG	1901-2005	
14	NAGPUR	1901-2006		14	GULBARGA	1901-2005	
15	NANDED	1901-2006		15	HASSAN	1901-2005	
16	NASIK	1901-2006		16	HAVERI	1901-2003	
17	OSMANABAD	1901-2006	2005	17	KANARA NORTH	1901-2005	
18	PARBHANI	1913-2006		18	KANARA SOUTH	1901-2005	
19	PUNE	1901-2006		19	KODAGU	1901-2005	
20	RATNAGIRI	1901-2006		20	KOLAR	1901-2003	
21	SANGLI	1901-2006		21	KOPPAL	1952-2003	
22	SATARA	1901-2006		22	MANDYA	1901-2005	
23	SHOLAPUR	1901-2006		23	MYSORE	1901-2005	
24	THANE	1901-2006		24	RAICHUR	1901-2005	
25	YEOTMAL	1901-2006		25	SHIMOGA	1901-2005	
26	WARDHA	1901-2006	2005	26	TUMKUR	1901-2003	
27	LATUR	1951-2006	1952, 1967	27	UDUPI	1901-2003	
28	GADCHIROLI	1901-2004		28	RAMNAGARA	1901-2002	1999
29	JALNA	1951-2004		29	CHICKBALLAPUR	1901-2003	1982
30	SINDHUDURG	1901-2006		30	YADGIR	1931-2003	1939, 1982
31	NANDURBAR	1901-2004			Nagaland		
32	GONDIA	1901-2006		1	MOKOKCHUNG	1901-1975	1958 - 1968, 1970
33	HINGOLI	1931-2004	1989	2	TUENSANG	1966-1981	1969, 1978 - 1980
34	WASHIM	1901-2006	2005	3	KOHIMA	1948-2005	1949,1951,1967-1969,1976,1978
35	BOMBAY SUBURBAN	1901-1989	1916, 1952, 1953, 1967, 1976	4	DIMAPUR	1901-1986	1958 - 1978
	Manipur			5	KIPHIRA	1998-2004	
1	BISHNUPUR	1957-1977	1958, 1964	6	MON	1928-2004	1958-1975,1984,1987-1992
2	CHANDEL	1959-1979	1964	7	PHEK	1995-2004	
3	CHURACHANDPUR	1959-2003	1964, 1979, 1985 - 1989	8	PEREN	1930-2004	1950,1951,1957-1994,2000
4	IMPHAL EAST	1901-2005		9	WOKHA	1901-2004	1953, 1958 - 1996
5	IMPHAL WEST	1957-1977	1958, 1964, 1976	10	ZUNHEBOTO	2002-2002	
6	SENAPATI	1928-2005	1944 - 1951, 1954-1958, 1978 - 1989, 1992		Sikkim		
7	TAMENLONG	1922-1976	1956, 1958, 1964, 1965, 1968, 1972, 1973	1	NORTH SIKKIM	1971-2007	1982, 1985, 1986
8	THOUBAL	1959-1977	1945 - 1958, 1964	2	WEST SIKKIM	1971-2004	1982-1984,1986,1988-1990
9	UKHRUL	1922-1977		3	EAST SIKKIM	1971-2007	1982, 1983, 1985, 1986
				4	SOUTH SIKKIM	1971-2007	1981 - 1989

Table 1. Availability of data of the districts and also missing years for different states (Contd.)

S.N.	DISTRICT	AVAILABILITY	MISSING YEARS	S.N.	DISTRICT	AVAILABILITY	MISSING YEARS
	Mizoram				Punjab		
1	AIZWAL	1901-2005	1966, 1967, 1968, 1970 - 1984	1	AMRITSAR	1901-2005	
2	CHAMPHA	1901-2005	1953, 1958, 1960 - 1985	2	BARNALA	1953-2005	1971
3	KOLASIB	1909-2005	1955, 1958, 1960 - 1965, 1967 - 1985	3	BHATINDA	1901-2005	1950, 1951, 1953
4	LAWNGTLI	1986-2005		4	FATEHGARH SAHIB	1954-2005	1971
5	LUNGLEI	1901-2005	1958, 1960 - 1965, 1967, 1969 - 1978, 1980 - 1983	5	FEROZEPUR	1901-2002	
6	MAMIT	1999-2005		6	GURDASPUR	1901-2005	
7	SAIHA	1986-2005		7	HOSHIARPUR	1901-2002	1971, 1972
8	SERCHHIP	1982-2005		8	JULLUNDAR	1901-2002	
	Orissa			9	KAPURTHALA	1954-2002	1971
1	ANGUL	1901-2006		10	LUDHIANA	1901-2005	
2	BOLANGIR	1902-2006		11	MANSA	1954-2002	1971-1972
3	BALASORE	1901-2006	1972	12	MOGA	1901-2002	1971, 1984-1987
4	BARGARH	1906-2003	1901-1905, 1980	13	MUKTESAR	1901-2002	1971, 1984-1987
5	BHADRAK	1901-2006		14	NAWANSHAHAR	1901-2002	1951, 1971
6	BOUDH	1901-1997	1951, 1953, 1959 - 1963, 1965, 1966, 1968, 1969, 1971, 1972, 1980, 1993 - 1996	15	PATIALA	1901-2005	
7	CUTTACK	1901-2006		16	ROOPNAGAR	1901-2002	1966, 1967, 1970-1972
8	DEOGARH	1906-2004	1951, 1953, 1954, 1956, 1959 - 1963, 1965, 1966, 1968, 1969, 1972, 1980, 1982-1990	17	SANGRUR	1901-2002	1950, 1951, 1953, 1971
9	DHENKANAL	1901-2004	1951, 1953, 1959 - 1966, 1969, 1972, 1993	18	SAS NAGAR	1901-2002	1966-1967, 1971-1972
10	GAJAPATI	1901-2004	1951, 1953, 1959 - 1966, 1969, 1972, 1983	19	FARIDKOT	1901-2002	1971
11	GANJAM	1901-2006		20	TARN TARAN	1901-2002	1971, 1972
12	JAGATSINGPUR	1901-2006	1951, 1953, 1959 - 1963		Union Territory		
13	JAIPUR	1901-2005	1951, 1953, 1959 - 1963, 1965, 1966, 1968, 1969, 1972	1	DADRA & N.HAVELI	1961-1995	1962, 1963, 1968, 1984-1990
14	JHARSUGUDA	1919-2006		2	DAMAN	1977-1992	1980, 1986 - 1991
15	KALAHANDI	1902-2005	1914, 1950 - 1954, 1959 - 1966	3	DIU	1928-2001	1962, 1981, 1987 - 1989
16	KENDRAPADA	1901-1997	1951, 1953, 1956, 1957, 1959 - 1963, 1965, 1966, 1968, 1969, 1972, 1977, 1980, 1981, 1993-1996	4	PUDUCHERRY	1968-2006	1989, 1992
17	KEONJHAR	1901-2006	1951, 1953	5	CHANDIGARH	1954-1990	
18	KHURDA	1901-2006		6	KARAIKAL	1970-2006	1971 - 1974, 1977, 1992
19	KORAPUT	1901-2006	1963, 1999, 2000, 2001		Uttarakhand		
20	MALKANGIRI	1901-1998	1951, 1953, 1954, 1959 - 1963, 1965 - 1969, 1972, 1980, 1981	1	ALMORA	1901-2000	1983, 1984, 1993 - 1995
21	MAYURBHANJ	1901-2006	1951, 1953, 1969	2	CHAMOLI	1901-2006	
22	NOWRANGAPUR	1901-2005	1951, 1953, 1959 - 1966, 1968, 1969, 1972, 1977 - 1981	3	CHAMPAWAT	1901-2005	1962, 1967
23	NAYAGARH	1901-1998	1951, 1953, 1959 - 1966, 1968 - 1970, 1972, 1976, 1977, 1979, 1980, 1995	4	DEHRA DUN	1901-2006	
24	NAWAPARA	1911-2004	1951	5	HARDWAR	1901-2005	1964
25	KANDHAMAL	1901-2006	1951, 1953	6	NAINITAL	1901-2006	
26	PURI	1901-2006	1960	7	PAURI GARHWAL	1901-2000	1957, 1984, 1993 - 1995
27	RAYAGADA	1901-2004	1951, 1953, 1959 - 1963, 1965, 1966, 1968, 1969, 1972, 1976, 1977	8	PITHORGARH	1901-2006	
28	SAMBALPUR	1901-2006		9	TEHRIGARHWAL	1955-2006	
29	SONEPUR	1911-2003	1962, 1980, 1981, 1995	10	UTTAR-KASHI	1955-2005	1961, 1964
30	SUNDARGARH	1911-2006	1941 - 1950	11	UDHAM SINGH NAGAR	1901-1999	1983, 1984, 1993, 1994
				12	RUDRAPRAYAG	1901-2005	1983, 1984, 1993 - 1995
				13	BAGESWAR	1990-2000	1993 - 1995

Table 1. Availability of data of the districts and also missing years for different states (Contd.)

S.N.	DISTRICT	AVAILABILITY	MISSING YEARS	S.N.	DISTRICT	AVAILABILITY	MISSING YEARS
	Tamilnadu				Rajasthan		
1	CHENNAI	1901-2006	1903, 1909, 1912, 1917, 1921, 1930, 1936, 1940, 1944 -1950	1	AJMER	1901-2006	
2	COIMBATORE	1901-2006		2	ALWAR	1901-2000	
3	CUDDALORE	1901-2006		3	BANSWARA	1901-2005	
4	DHARAMPURI	1901-2006		4	BARMER	1901-2006	
5	DINDIGUL	1901-2006		5	BHARATPUR	1901-2003	2001
6	ERODE	1901-2006		6	BHILWARA	1901-2005	2004
7	KANCHEEPURAM	1901-2006		7	BIKANER	1901-2006	
8	KANNIYAKUMARI	1901-2006		8	BUNDI	1901-2000	
9	KARUR	1901-2006	1965	9	CHITTORGARH	1901-2005	2001, 2002
10	MADURAI	1901-2006		10	CHURU	1906-2006	
11	NAGAPATTINAM	1901-2006		11	DUNGARPUR	1901-2005	
12	NAMAKKAL	1901-2001		12	GANGANAGAR	1906-2006	
13	NILGIRIS	1901-2006		13	JAIPUR	1901-2006	
14	PERAMBALUR	1901-2003	1965	14	JAISALMER	1901-2006	
15	PUDUKOTTAI	1901-2006		15	JALORE	1901-2005	
16	RAMANATHAPURAM	1901-2006		16	JHALAWAR	1901-2006	
17	SALEM	1901-2006		17	JHUNJHUNU	1901-2005	
18	SIVAGANGAI	1901-2004		18	JODHPUR	1901-2006	
19	TANJAVUR	1901-2006		19	KOTAH	1901-2006	
20	THENI	1901-2001		20	NAGOUR	1901-2000	1952
21	THIRUVALLUR	1901-2005		21	PALI	1901-2005	
22	THIRUVARUR	1901-2004	2003	22	SAWAI MADHOPUR	1901-2005	
23	TIRUCHIRAPPALLI	1901-2006		23	SIKAR	1901-2004	
24	TIRUNELVELI	1901-2006		24	SIROHI	1901-2005	
25	TIRUVANNAMALAI	1901-2004		25	TONK	1901-2004	
26	THOOTHUKUDI	1901-2006		26	UDAIPUR	1901-2006	
27	VELLORE	1901-2006		27	DHOLPUR	1901-2005	2001
28	VILLUPURAM	1901-2004		28	BARAN	1901-2000	
29	VIRUDHUNAGAR	1901-2006		29	DAUSA	1901-2000	1965, 1967
30	KRISHNAGIRI	1901-2004		30	RAJASMAND	1901-2000	
31	ARIYALUR	1901-2003	1965	31	HANUMANGARH	1906-1995	
32	TIRUPUR	1901-2004		32	KARAULI	1901-1995	1967, 1968
	West Bengal				West Bengal		
1	BANKURA	1901-2006		15	24 PARGANAS N	1901-2005	
2	BIRBHUM	1901-2006		16	24 PARGANAS S	1901-2005	
3	BURDWAN	1901-2006		17	DINAJPUR SOUTH	1901-2001	1949
4	COOCH BEHAR	1901-2007		18	WEST MIDNAPORE	1901-2005	
5	DARJEELING	1901-2007		19	KOLKATA	1901-2005	1911
6	HOOGLY	1901-2005	1957, 1958, 1964, 1967, 1970				
7	HOWRAH	1901-2005					
8	JALPAIGURI	1901-2007					
9	MALDA	1901-2005	1976				
10	MANBHUM PURULIA	1901-2002					
11	EAST MIDNAPORE	1901-2005					
12	MURSHIDABAD	1901-2006					
13	NADIA	1901-2006	1989				
14	DINAJPUR NORTH	1901-2004	1960,1970,1971,1979-1989,1995,1996				

Table 1. Availability of data of the districts and also missing years for different states (Contd.)

S.N.	DISTRICT	AVAILABILITY	MISSING YEARS	S.N.	DISTRICT	AVAILABILITY	MISSING YEARS
1	AGRA	1901-2009		47	MAU	1901-2009	1983, 1984
2	ALJARH	1901-2009		48	MAINPURI	1901-2009	
3	ALLAHABAD	1901-2009		49	MATHURA	1901-2009	
4	AMBEDKAR NGR	1901-2009	1964, 1968, 1983, 1984, 1993, 1994, 1995, 1999	50	MAHARAIGANJ	1901-2009	1983, 1984
5	AURAIYA	1901-2009	1958, 1983, 1984	51	MEERUT	1901-2009	
6	AZAMGARH	1901-2009	1983, 1984	52	MIRZAPUR	1901-2009	
7	BAGHPAT	1901-2009	1961, 1968, 1983, 1984, 1993, 1994, 1995	53	MORADABAD	1901-2009	
8	BAHRAICH	1901-2009		54	MUZAFFARNAGAR	1901-2009	
9	BALLIA	1901-2009	1968, 1983, 1984	55	PILIBHIT	1901-2009	1968, 1983, 1984
10	BALRAMPUR	1901-2009		56	PRATAPGARH	1901-2009	1983, 1984
11	BANDA	1901-2009	1968	57	RAE BARELI	1901-2009	1983, 1984
12	BARA BANKI	1901-2009		58	RAMPUR	1961-2009	1983, 1984
13	BAREILLY	1901-2009	1983, 1984	59	LUCKNOW	1901-2009	
14	BASTI	1901-2009		60	SHAHJAHANPUR	1901-2009	1968
15	BIJNOR	1901-2009	1968	61	SAHARANPUR	1901-2009	
16	BUDAUN	1901-2009		62	SIDDHARTHINAGAR	1901-2009	
17	BULANDSHAHR	1901-2009	1959, 1983, 1984, 1993, 1994, 1995	63	SITAPUR	1901-2009	1964, 1968
18	CHANDAUJI	1901-2009	1952, 1954, 1983, 1984	64	SULTANPUR	1901-2009	1983, 1984
19	KANSHIRAM NAGAR	1901-2009	1983, 1984	65	SONBHADRA	1901-2009	1968, 1983, 1984
20	DEORIA	1901-2009	1983	66	UNNAO	1901-2009	1968, 1983, 1984
21	ETAH	1901-2009	1983, 1984	67	VARANASI	1901-2009	
22	ETAWAH	1901-2009	1983, 1984	68	KHERI LAKHIMPUR	1901-2009	
23	FAIZABAD	1901-2009	1983, 1984	69	LALITPUR	1901-2009	1983, 1984
24	FARRUKHABAD	1901-2009	1983, 1984	70	KANPUR NAGAR	1901-2009	
25	FATEHPUR	1901-2009	1983, 1984	71	KANPUR DEHAT	1901-2009	1983, 1984
26	FIROZABAD	1901-2009	1983, 1984				
27	G.BUDH NAGAR	1990-2009	1993 - 1995, 2001 - 2003				
28	GAZIABAD	1901-2009	1983, 1984				
29	GHAZIPUR	1901-2009					
30	GONDA	1901-2009					
31	GORAKHPUR	1901-2009					
32	HAMIRPUR	1901-2009	1961, 1964				
33	HARDOI	1901-2009					
34	HATHRAS	1901-2009	1983, 1984, 1993, 1994, 1995				
35	JALAU	1901-2009					
36	JAUNPUR	1901-2009	1983, 1984				
37	JHANSI	1901-2009					
38	J.PHULE NAGAR	1901-2009	1953, 1968, 1983, 1984, 1993, 1994, 1995, 1999, 2001, 2002, 2003				
39	KANNAUJ	1901-2009	1983, 1984, 1993, 1994, 1995, 2000, 2003				
40	MAHOBA	1901-2009	1961, 1964, 1983, 1984, 2001, 2002, 2003				
41	CHITRAKOOT	1901-2009	1983, 1984, 1993, 1994, 1995				
42	KAUSHAMBI	1901-2009	1983, 1984, 1993, 1994, 1995				
43	KHUSHINAGAR	1901-2009	1983, 1984, 1993, 1994, 1995, 1996, 1999				
44	SANT RAVIDAS NGR	1980-2009	1981 - 1986, 1989, 1999, 2001 - 2003				
45	SHRAVASTI	1969-2009	1970, 1973 - 1995, 2001 - 2003				
46	S.KABIR NGR	1901-2009	1968, 1983, 1984, 1993, 1994, 1995, 2001, 2002, 2003				

Table 1. Availability of data of the districts and also missing years for different states in the new rainfall series

YR/SD NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
1901	1	0	23	8	6	13	22	19	36	39	28	10	20	15	7	14	7	22	25	17	15	8	8	10	4	11	8	9	10	4	32	3	8	16	14	1
1902	1	0	24	8	6	13	24	21	36	39	28	10	20	15	7	14	7	22	25	17	15	8	8	10	4	11	12	9	10	4	32	3	9	16	14	1
1903	1	0	25	8	6	13	24	22	36	39	28	10	20	15	8	14	7	22	25	17	16	8	8	10	4	11	12	9	10	4	31	3	9	16	14	1
1904	1	0	25	8	6	13	24	22	36	39	28	10	20	15	8	14	7	22	25	17	16	8	8	10	4	11	12	9	10	4	32	3	9	16	14	1
1905	1	0	25	8	6	13	24	23	36	39	28	10	20	15	8	14	7	22	25	17	16	8	8	10	4	11	12	9	10	4	32	3	9	16	14	1
1906	1	0	25	8	6	13	26	23	36	39	28	10	20	15	8	14	10	22	28	17	16	8	8	10	4	11	12	9	10	4	32	3	9	16	14	1
1907	1	0	25	8	6	13	26	23	36	39	28	10	20	15	8	14	10	22	29	17	16	8	8	10	4	11	12	9	10	4	32	3	9	16	14	1
1908	1	0	25	8	6	13	26	24	36	39	28	10	20	15	8	15	10	22	29	17	16	8	8	10	4	11	12	9	10	4	32	3	9	16	14	1
1909	0	0	25	9	6	13	26	24	36	39	28	10	20	15	8	15	10	22	29	17	16	8	8	10	4	11	12	9	10	4	31	3	9	16	14	1
1910	1	0	24	9	6	13	26	24	36	39	28	10	19	15	8	15	10	22	29	17	16	8	8	10	4	11	13	9	10	4	32	3	8	16	14	1
1911	1	0	25	9	6	12	29	24	36	39	28	10	20	15	7	16	10	22	29	17	16	8	8	10	4	11	13	9	10	4	32	3	9	16	14	1
1912	1	0	25	9	6	13	29	24	36	39	28	10	20	15	7	16	10	22	29	17	16	8	8	10	4	11	13	9	9	4	31	3	9	16	14	1
1913	1	0	25	9	6	13	29	24	36	39	28	10	20	15	7	16	10	22	29	17	16	8	8	10	5	11	14	9	9	4	32	3	9	16	14	1
1914	1	0	25	9	6	13	28	24	36	39	28	10	20	15	7	16	10	22	29	17	16	8	8	10	5	11	14	9	9	4	32	3	9	16	14	1
1915	1	0	24	9	6	13	29	24	36	39	28	10	20	15	7	16	10	22	29	17	16	8	8	10	5	11	14	9	9	4	32	3	9	16	14	1
1916	1	1	25	9	6	13	29	24	36	39	28	10	20	15	7	17	10	22	29	17	16	8	7	10	5	11	14	9	10	4	32	3	9	16	14	1
1917	1	1	24	9	6	13	29	24	36	39	28	10	20	15	7	17	10	22	29	17	16	8	8	10	5	11	14	9	10	4	31	3	9	16	14	1
1918	1	1	25	9	6	13	29	24	36	39	28	10	20	15	7	17	10	22	28	17	16	8	8	10	5	11	14	9	10	4	32	3	9	16	14	0
1919	1	1	25	9	6	13	30	24	36	39	28	10	20	15	7	17	10	22	29	17	16	8	8	10	5	11	14	9	10	4	32	3	8	16	14	1
1920	1	1	25	9	6	13	30	24	36	39	28	10	20	15	7	17	10	22	29	17	15	8	8	10	5	11	14	9	10	4	32	3	8	16	14	1
1921	1	1	25	9	6	13	30	24	36	39	28	10	20	15	8	17	10	22	28	17	16	8	8	10	5	11	14	9	10	4	31	3	8	16	14	1
1922	1	1	25	11	6	13	30	24	36	39	28	10	20	15	8	17	10	22	29	17	16	8	7	10	5	11	14	9	10	4	32	3	8	16	14	1
1923	1	1	25	11	6	13	30	24	36	39	28	10	20	15	8	17	10	22	29	17	16	8	8	10	5	11	14	9	9	4	32	3	9	16	14	1
1924	1	1	25	11	6	13	30	24	34	39	28	10	20	15	8	17	10	22	29	17	16	8	8	10	5	11	14	9	9	4	32	3	9	16	14	1
1925	1	1	25	11	6	13	30	24	36	39	28	10	20	15	8	17	10	22	29	17	16	8	8	10	5	11	14	9	9	4	32	3	9	16	14	1
1926	1	1	25	11	6	13	30	24	36	39	28	10	20	15	8	17	10	22	29	17	16	8	8	10	5	11	14	9	10	4	32	3	9	16	14	1
1927	1	1	25	11	6	13	30	24	35	39	28	10	20	15	8	17	10	22	29	17	17	8	8	10	5	11	15	9	10	4	32	3	9	16	14	1
1928	1	1	25	13	6	13	30	24	35	39	28	10	20	15	8	17	10	22	29	17	17	9	8	10	5	11	15	9	10	4	32	3	8	16	14	1
1929	1	3	25	13	6	13	30	24	36	39	28	10	20	15	8	17	10	22	29	17	17	9	8	10	5	11	15	9	10	4	32	3	9	16	14	1
1930	1	3	25	14	6	13	30	24	36	39	28	10	20	15	8	17	10	22	29	16	17	9	8	10	5	11	15	9	10	4	31	3	9	16	14	1
1931	1	3	25	14	6	13	30	24	36	39	28	10	20	15	8	17	10	22	30	18	17	9	8	10	6	11	15	9	10	4	32	3	10	16	14	1
1932	1	3	25	14	6	13	30	24	36	39	28	10	20	15	8	17	10	22	30	18	17	9	8	10	6	11	15	9	10	4	32	3	10	16	14	1
1933	1	3	25	14	6	13	30	23	36	39	28	10	20	15	8	17	10	22	30	18	17	9	8	10	6	11	15	9	10	4	32	3	10	16	14	1
1934	1	3	25	14	6	13	30	24	36	39	28	10	20	15	8	17	10	22	30	18	17	9	8	10	6	11	15	9	10	4	32	3	10	16	14	1
1935	1	3	25	14	6	13	30	24	35	39	28	10	20	15	8	17	10	22	30	18	17	9	8	10	6	11	15	9	10	4	32	3	10	16	14	1
1936	1	3	25	14	6	13	30	24	35	39	28	10	20	15	8	17	10	22	30	18	17	9	8	10	6	11	15	9	10	4	31	3	10	16	14	1
1937	1	3	25	14	6	13	30	24	35	39	28	10	20	15	8	17	10	22	30	18	17	9	8	10	6	11	15	9	10	4	32	3	10	16	14	1
1938	1	3	25	16	6	13	30	24	35	39	28	10	20	15	8	17	10	22	30	18	17	9	8	10	6	11	15	9	10	4	32	3	10	16	14	1

Table 2. Number of districts used for each year to get the subdivision values (Contd.)

YR/SD NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
1939	1	3	25	16	6	13	30	24	35	39	28	10	20	15	8	17	10	22	30	18	17	9	8	10	6	11	18	9	10	4	32	3	9	16	14
1940	1	3	25	16	6	13	30	24	35	39	28	10	20	15	8	17	10	22	30	19	17	9	8	10	6	11	18	9	10	4	31	3	10	16	14
1941	1	3	25	16	6	13	29	24	35	39	28	10	22	15	8	17	10	22	30	19	17	9	8	10	5	11	18	9	10	4	32	3	10	16	14
1942	1	3	24	16	6	13	29	24	35	39	28	10	22	15	8	17	10	22	30	19	17	9	8	10	6	11	18	9	10	4	32	3	10	16	14
1943	0	3	25	16	6	13	29	24	35	39	28	10	22	15	8	17	10	22	30	18	17	9	8	10	6	11	18	9	10	4	32	3	10	16	14
1944	0	3	24	15	6	13	29	24	35	39	28	10	22	15	9	17	10	22	30	19	17	9	8	10	6	11	18	9	10	4	31	3	10	16	14
1945	0	3	24	14	6	13	29	24	35	39	28	10	22	15	8	16	10	22	30	19	17	9	8	10	6	11	18	9	10	4	31	3	10	16	14
1946	1	3	25	14	6	13	29	24	36	39	28	10	22	15	8	16	10	22	30	19	17	9	8	10	6	11	18	9	10	4	31	3	10	16	14
1947	1	3	25	14	6	13	29	24	36	39	28	10	22	15	8	15	10	22	30	19	17	9	8	10	6	11	18	9	10	4	31	3	10	16	14
1948	0	3	25	15	6	13	28	24	36	39	28	10	22	15	8	14	10	22	30	19	17	9	8	10	6	11	18	9	10	4	31	3	10	16	14
1949	1	3	25	14	5	13	28	24	36	39	28	10	22	15	7	14	10	22	29	19	17	9	8	10	6	11	18	9	10	4	31	3	10	16	14
1950	1	3	25	14	6	13	26	24	36	39	28	10	21	13	8	14	10	22	30	19	17	9	8	10	6	11	18	9	10	4	31	3	10	16	14
1951	1	3	24	12	6	13	14	24	35	39	28	11	21	12	11	13	10	22	30	19	17	9	8	10	8	11	18	9	10	4	32	3	10	16	14
1952	1	1	25	16	6	13	29	24	33	39	27	11	21	15	11	13	9	22	30	19	17	9	7	10	7	11	18	9	10	4	32	3	11	16	14
1953	3	1	24	14	6	13	15	24	35	39	27	11	22	14	10	13	10	22	30	19	17	9	7	10	8	11	18	9	10	4	32	3	11	16	14
1954	3	0	25	13	6	13	27	24	36	39	27	11	25	20	12	13	10	22	30	19	17	9	8	10	8	11	18	9	10	4	32	3	11	16	14
1955	3	0	25	14	6	13	30	24	36	39	28	12	25	20	12	14	10	22	30	19	17	9	8	10	8	11	18	9	10	4	32	3	11	16	14
1956	3	0	25	14	6	13	28	24	36	39	28	12	25	20	12	13	10	22	30	18	17	9	8	10	8	11	18	9	10	4	32	3	11	16	14
1957	3	1	25	17	6	12	29	24	36	39	28	11	24	20	12	5	10	22	30	19	17	9	8	10	8	11	18	9	10	4	32	3	11	16	14
1958	3	1	18	7	6	12	30	24	35	39	27	12	25	19	12	12	10	22	30	20	17	9	8	10	8	11	18	9	10	4	32	3	11	16	14
1959	3	1	25	18	6	13	18	23	34	38	28	12	26	19	12	11	10	22	29	19	17	9	8	10	8	11	17	9	10	4	32	3	11	16	14
1960	3	1	18	15	5	13	17	24	33	39	28	12	26	20	11	15	10	22	29	20	17	9	8	10	8	11	15	9	10	4	32	3	11	16	14
1961	3	1	18	15	6	13	18	24	36	39	26	12	25	19	12	16	10	22	29	18	18	9	8	10	8	11	16	9	10	4	32	3	11	16	14
1962	3	1	17	15	6	13	17	24	36	39	29	11	25	20	12	19	10	22	30	19	17	8	8	10	8	11	18	9	10	4	32	3	11	16	14
1963	3	1	16	15	6	13	17	24	35	39	29	12	25	19	10	12	10	22	30	20	17	9	8	10	8	11	18	9	10	4	32	3	11	16	14
1964	3	1	18	9	6	12	25	24	37	37	27	11	26	20	12	13	10	22	29	19	18	9	8	10	8	10	17	9	10	4	32	3	11	16	14
1965	3	3	18	14	6	13	19	24	37	39	29	12	27	20	12	13	10	21	30	20	18	9	8	10	8	10	17	9	10	4	29	3	11	16	14
1966	3	11	22	15	6	13	19	24	37	39	29	12	9	17	10	18	10	22	29	18	18	9	8	10	8	11	17	9	10	4	32	3	11	16	14
1967	3	3	22	14	6	12	28	24	37	39	29	11	11	17	12	18	10	20	29	18	18	9	7	10	7	11	17	9	9	4	32	3	11	16	14
1968	3	11	21	14	6	13	20	24	37	32	24	12	24	20	12	17	10	21	30	20	17	9	8	10	8	11	18	9	10	4	33	3	11	16	14
1969	3	13	17	15	6	13	19	24	37	40	29	12	23	20	11	18	10	22	29	17	17	9	8	10	8	11	13	9	10	4	33	3	11	16	14
1970	3	3	13	15	5	12	29	24	37	39	29	12	22	19	12	13	10	22	26	18	18	9	8	10	8	11	11	9	10	4	34	3	11	16	14
1971	3	9	18	16	9	13	19	13	12	40	29	12	26	7	12	13	10	22	27	19	18	9	8	10	8	11	11	9	10	4	33	3	11	16	14
1972	3	9	18	14	10	13	19	13	15	40	29	12	25	14	12	14	10	22	27	20	18	9	8	10	8	11	16	9	10	4	33	3	11	16	14
1973	3	8	18	15	10	13	30	13	13	39	29	12	26	20	12	13	10	22	30	17	18	9	8	10	8	11	18	9	10	4	33	3	11	16	14
1974	3	8	17	16	10	13	30	19	37	39	29	12	25	20	12	12	10	22	30	17	19	9	8	10	8	11	18	9	10	4	33	3	11	16	14
1975	3	7	20	16	10	13	29	24	37	39	29	12	25	20	12	14	10	22	30	17	19	9	8	10	8	11	18	9	10	4	34	3	11	16	14
1976	3	12	25	14	9	13	26	24	37	39	29	12	26	20	12	13	10	22	30	17	19	9	7	10	8	11	18	9	10	4	34	3	11	16	14
1977	3	11	25	15	10	13	26	22	35	39	29	12	26	20	12	13	10	22	29	18	20	9	8	10	8	11	18	9	10	4	33	3	11	16	14

Table 2. Number of districts used for each year to get the subdivision values (Contd.)

YR/SD NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
1978	3	13	26	8	10	13	28	22	35	39	29	12	26	20	11	13	10	22	30	18	20	9	8	10	8	11	18	9	10	4	34	3	11	16	14	1	
1979	3	12	28	10	9	13	28	23	36	39	29	12	26	20	12	14	10	22	30	18	19	9	8	10	8	11	18	9	10	4	34	3	11	16	14	1	
1980	3	13	27	9	8	13	22	23	37	40	29	12	25	20	12	13	10	22	30	18	18	9	8	10	8	11	18	9	10	4	34	3	11	16	14	1	
1981	3	14	29	10	8	13	26	22	36	39	29	12	26	20	12	14	10	22	29	18	19	8	8	10	8	11	16	9	10	4	34	3	11	16	14	1	
1982	3	13	28	9	5	13	29	22	34	39	29	12	26	20	12	14	10	22	30	19	19	9	8	10	8	11	16	9	10	4	34	3	10	15	14	1	
1983	3	14	31	10	6	13	28	22	34	17	15	9	26	20	12	10	10	22	30	20	19	9	8	10	8	11	17	9	10	4	34	3	11	16	14	1	
1984	3	14	31	5	7	13	29	23	34	18	15	8	26	18	12	11	10	22	29	20	18	9	8	10	8	11	17	9	10	4	34	3	11	16	14	1	
1985	3	14	33	11	6	13	29	22	34	39	29	12	22	18	12	11	10	22	30	20	18	9	8	10	8	11	18	8	10	4	34	3	11	16	14	1	
1986	3	14	31	15	5	13	29	23	37	39	29	12	22	18	12	9	10	22	30	20	17	9	8	10	8	11	18	8	10	4	34	3	11	16	14	1	
1987	3	8	31	13	8	13	29	22	36	40	29	12	20	18	12	8	10	22	30	20	17	8	8	10	8	11	18	9	10	4	32	3	11	16	10	1	
1988	3	8	25	13	7	13	29	22	35	40	29	12	22	20	12	8	10	22	30	20	17	8	8	10	8	11	18	9	10	4	34	3	11	16	12	1	
1989	3	7	26	13	7	12	29	24	38	39	29	12	19	20	12	8	10	22	30	20	17	8	8	10	7	11	18	9	10	4	33	3	11	16	13	1	
1990	3	8	26	14	8	13	29	22	35	40	30	13	24	20	12	9	10	22	30	20	17	9	7	10	8	11	18	9	10	4	34	3	11	16	14	1	
1991	3	8	32	15	10	13	30	24	38	40	30	13	25	20	12	8	10	22	30	20	11	9	7	10	8	11	18	9	10	4	34	3	11	16	14	1	
1992	3	8	32	14	10	13	30	24	38	40	30	13	25	20	12	10	10	22	30	20	19	9	7	10	8	11	18	9	10	4	32	3	11	16	14	1	
1993	3	9	32	16	10	13	25	24	38	33	26	8	25	20	12	12	10	22	30	20	19	9	7	10	8	11	18	9	10	4	34	3	11	16	14	1	
1994	3	9	31	16	10	13	28	24	38	33	26	8	25	20	12	13	10	22	30	20	19	9	7	10	8	11	18	9	10	4	34	3	11	16	14	1	
1995	3	9	32	18	9	13	26	24	38	32	26	8	25	20	12	10	10	22	30	20	19	9	7	10	8	11	18	9	10	4	34	3	11	16	14	1	
1996	3	9	32	18	8	13	27	24	38	38	30	13	25	20	12	12	9	21	30	20	18	9	7	10	8	11	18	9	10	4	34	3	11	16	14	1	
1997	3	9	32	19	10	13	29	24	38	41	30	13	25	20	12	11	9	20	30	20	17	9	7	10	8	11	18	9	10	4	34	3	11	15	14	1	
1998	2	8	30	20	9	13	28	24	38	41	30	13	25	20	12	13	9	21	30	20	16	9	7	10	8	11	18	9	10	4	34	3	11	16	14	1	
1999	3	9	30	21	10	13	25	24	38	36	29	12	26	20	12	14	9	21	30	20	12	8	7	10	8	11	18	9	10	4	34	3	11	14	14	1	
2000	2	9	30	20	10	13	25	24	38	40	30	12	25	20	12	13	9	21	28	18	8	8	7	10	8	11	8	9	10	4	34	3	11	16	14	1	
2001	3	9	30	21	10	13	25	24	38	38	27	9	27	20	12	13	7	12	30	20	18	9	7	10	8	11	8	9	10	4	34	3	11	16	14	1	
2002	3	9	30	22	9	13	26	24	38	38	27	9	26	20	12	13	8	15	30	20	18	8	7	10	8	11	8	9	10	4	31	3	11	16	14	1	
2003	3	9	26	21	9	12	26	24	37	37	27	9	26	7	12	12	8	15	30	20	18	8	7	10	8	11	7	9	10	4	30	3	11	14	14	1	
2004	3	9	27	20	9	12	24	24	38	41	30	9	27	7	9	11	7	14	29	20	11	7	7	10	8	11	6	9	10	4	29	2	7	9	14	1	
2005	3	8	26	12	7	12	18	12	38	41	30	9	27	7	9	0	8	12	20	15	11	7	7	8	4	8	8	9	10	4	24	2	6	9	8	1	
2006	0	6	19	0	6	5	16	8	38	41	30	5	0	0	0	0	6	5	14	13	7	7	7	7	5	9	8	8	9	4	23	0	0	0	0	0	
2007	0	0	0	0	6	0	0	0	0	41	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0
2008	0	0	0	0	0	0	0	0	0	41	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0
2009	0	0	0	0	0	0	0	0	0	41	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0

Table 2. Number of districts used for each year to get the subdivision values

YEAR/SD NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
1901	1	0	80	10	22	56	52	39	72	112	114	34	40	45	16	23	30	82	40	38	57	27	32	88	4	59	11	90	12	44	172	21	39	87	47	1
1902	1	0	83	10	23	57	55	52	73	114	115	34	40	45	16	26	31	86	40	40	57	27	36	92	4	59	20	90	12	44	181	20	38	93	48	1
1903	1	0	83	10	23	57	57	53	77	114	115	34	40	44	17	27	31	86	40	40	58	27	36	96	4	59	23	90	12	44	185	20	37	93	50	1
1904	1	0	86	10	23	56	59	55	77	114	115	33	41	45	17	27	31	87	38	40	58	26	35	93	4	58	24	90	12	43	191	19	37	94	50	1
1905	1	0	86	10	23	58	60	61	81	115	115	33	41	45	17	27	31	87	40	42	58	27	36	92	4	60	26	92	12	47	198	20	38	92	61	1
1906	1	0	87	11	24	58	70	61	83	114	115	33	41	45	17	27	47	87	66	46	61	28	37	97	4	66	39	93	12	47	201	20	38	93	61	1
1907	1	0	89	11	24	62	69	62	81	116	116	33	41	45	17	27	47	88	70	47	61	28	37	93	4	64	39	93	12	47	200	20	38	95	66	1
1908	1	0	88	11	24	63	69	63	86	117	116	33	42	45	17	27	47	88	71	47	61	28	35	95	4	66	38	93	12	47	200	20	38	92	69	1
1909	0	0	87	12	24	67	72	63	87	117	116	33	42	45	17	28	47	90	71	47	61	28	36	96	4	67	39	93	12	47	198	20	38	93	69	1
1910	1	0	92	11	24	75	72	67	92	117	117	33	41	45	17	29	49	91	71	47	61	28	36	96	4	67	40	93	12	47	200	20	37	93	69	1
1911	1	0	92	12	24	76	78	68	99	116	122	33	43	46	16	30	49	92	72	47	61	28	35	95	4	67	40	93	12	49	204	19	37	91	69	1
1912	1	0	94	12	24	77	80	69	92	117	122	33	43	47	16	30	49	93	71	47	61	28	36	98	4	66	41	92	11	51	205	20	37	94	68	1
1913	1	0	94	11	22	74	81	72	97	117	122	33	41	46	16	30	49	93	72	48	61	28	36	96	5	67	42	93	11	51	204	20	37	92	70	1
1914	1	0	93	12	23	76	83	71	109	117	122	34	42	46	16	31	49	94	73	50	61	28	36	94	5	69	43	94	12	52	206	19	37	94	70	1
1915	1	0	94	13	23	82	88	77	115	117	121	34	42	46	16	31	49	93	73	51	61	28	36	96	5	71	44	95	12	52	209	20	35	93	69	1
1916	1	1	96	13	24	83	88	78	118	117	121	34	42	46	16	32	49	95	72	51	61	28	35	96	5	72	44	96	13	52	223	20	37	94	73	1
1917	1	1	95	13	24	82	92	79	119	117	122	34	42	46	16	32	49	95	74	53	61	28	34	98	5	70	44	96	13	52	218	20	37	94	73	1
1918	1	1	96	12	23	86	93	80	119	117	122	34	41	46	16	32	49	95	75	54	60	28	36	99	5	74	44	96	13	52	222	20	36	94	70	0
1919	1	1	96	13	24	95	97	81	121	117	122	34	42	46	16	32	49	94	74	53	61	28	36	97	5	73	45	96	13	52	222	20	35	94	71	1
1920	1	1	96	13	24	97	99	81	123	117	122	34	42	46	16	33	49	95	76	53	60	28	35	96	5	74	45	96	13	53	220	19	36	92	74	1
1921	1	1	98	13	25	98	99	81	126	116	121	33	42	46	17	33	48	95	74	54	61	28	37	97	5	75	45	95	13	54	221	20	35	92	74	1
1922	1	1	99	15	25	95	97	82	126	118	122	34	42	46	17	33	49	93	73	56	61	28	36	98	5	75	45	97	13	53	221	20	36	90	73	1
1923	1	1	99	15	25	99	101	84	130	118	122	34	42	45	17	33	49	94	79	56	62	28	37	98	5	75	44	96	12	54	224	20	36	94	73	2
1924	1	1	98	15	25	100	101	85	130	117	122	34	42	45	17	34	49	94	81	56	62	27	35	99	5	74	44	97	12	54	220	20	37	92	74	2
1925	1	1	99	15	25	96	102	85	131	118	122	34	42	45	17	34	49	82	71	54	62	28	36	100	5	75	43	96	12	54	222	20	36	92	72	2
1926	1	1	98	15	24	95	103	85	130	119	124	34	42	45	17	34	50	82	69	54	62	28	36	100	5	75	44	96	13	54	222	20	36	91	71	1
1927	1	1	99	15	24	97	102	86	128	119	124	34	42	45	17	35	50	82	71	75	71	29	36	99	5	79	60	97	13	55	225	20	35	95	73	1
1928	1	1	99	17	21	95	103	86	127	118	124	34	42	46	17	33	62	95	77	74	70	31	42	98	5	80	60	97	13	62	223	19	33	94	73	1
1929	1	3	99	17	23	97	105	86	128	119	124	34	42	46	17	33	66	104	84	75	71	31	40	96	5	81	59	97	13	62	226	20	36	95	75	1
1930	1	3	100	18	24	101	105	87	131	118	124	33	42	46	18	34	67	109	86	76	71	31	43	94	5	79	60	98	26	66	224	20	37	95	74	2
1931	1	3	99	18	24	99	105	88	132	120	125	33	42	46	18	35	68	116	101	76	72	31	41	98	8	80	59	97	41	65	224	20	41	93	74	2
1932	1	3	101	18	23	101	107	88	133	120	124	33	42	46	19	35	68	118	100	78	77	31	41	99	8	80	59	97	41	65	223	19	41	91	75	2
1933	1	3	100	18	24	101	108	89	135	121	124	33	42	46	19	35	68	118	101	78	77	31	43	98	8	80	57	98	48	65	230	20	41	108	75	2
1934	1	3	101	18	24	103	111	92	134	121	124	34	43	46	19	34	68	119	102	80	82	30	43	104	8	80	60	99	48	65	230	19	42	109	73	2
1935	1	3	101	18	23	103	108	93	137	121	124	34	43	45	19	34	68	119	103	80	82	31	45	105	8	81	59	99	50	67	231	20	41	109	76	2
1936	1	3	101	18	23	107	111	94	142	120	124	39	43	45	19	34	68	123	104	80	83	31	47	105	8	81	59	100	53	68	232	20	41	110	75	2
1937	1	3	101	18	25	110	112	96	141	121	124	38	43	45	19	34	68	122	106	80	83	31	46	106	8	78	59	99	53	70	230	20	42	112	76	2

Table 3. Number of stations used for each year to get the subdivision values (Contd)

YEAR/SD NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
1938	1	3	101	27	25	111	113	96	142	120	124	39	43	46	19	35	68	123	106	79	83	31	47	107	8	79	60	100	55	70	233	19	42	112	75	2
1939	1	3	101	27	24	110	114	96	140	122	124	39	43	46	19	35	68	123	106	79	83	31	44	110	8	80	71	99	56	70	235	19	41	110	73	2
1940	1	3	102	27	25	112	116	95	141	122	123	39	45	45	19	35	68	126	108	83	83	31	44	109	8	80	69	100	57	70	232	21	41	111	74	2
1941	1	3	103	27	24	113	103	95	142	123	124	39	51	47	19	37	68	126	108	85	83	31	44	108	7	81	69	99	58	70	235	21	42	111	74	2
1942	1	3	100	27	23	114	92	96	140	122	124	39	50	47	19	37	69	132	107	85	83	31	46	109	8	81	72	100	58	69	238	20	41	112	76	2
1943	0	3	98	27	23	104	112	96	139	124	124	39	51	47	19	38	69	132	109	83	83	31	45	106	9	81	71	100	65	69	233	20	41	112	72	2
1944	0	3	100	26	24	105	110	91	133	123	123	36	51	47	20	38	68	133	107	85	83	31	43	109	9	81	72	101	65	70	238	21	42	111	77	2
1945	0	3	100	25	24	99	106	97	132	125	125	38	51	47	19	32	70	134	109	86	83	31	45	110	9	83	72	102	65	70	237	21	42	111	76	2
1946	1	3	99	25	23	94	111	93	135	126	126	39	51	47	19	32	69	135	108	86	83	31	47	111	9	84	73	103	65	69	238	21	42	108	80	1
1947	1	3	96	25	22	84	109	90	136	126	126	39	51	47	19	29	69	135	107	86	83	31	46	109	9	83	74	103	64	71	234	21	42	108	78	2
1948	0	3	94	26	26	88	101	100	131	125	126	39	51	47	19	23	69	134	109	85	83	31	47	109	9	85	74	102	65	71	240	20	42	112	80	2
1949	1	3	93	25	21	75	81	98	131	128	126	39	52	47	18	24	70	135	108	87	82	31	47	103	9	86	74	103	64	70	234	20	41	114	80	2
1950	1	3	82	23	25	75	62	100	122	127	127	38	49	40	18	25	70	134	110	87	80	31	48	105	9	88	72	103	64	70	236	21	46	109	79	2
1951	1	3	86	21	26	77	20	120	140	128	112	44	54	42	52	24	51	121	114	102	88	31	47	107	30	86	77	187	86	82	310	20	45	112	83	2
1952	1	1	98	26	25	95	117	119	131	131	116	45	51	49	59	24	43	116	114	101	90	33	45	102	31	88	83	187	96	84	313	20	54	262	84	2
1953	6	1	92	24	24	93	21	116	125	122	121	45	49	45	61	24	44	124	119	96	91	39	48	104	34	90	87	189	103	85	319	20	55	257	84	2
1954	7	0	106	17	25	91	94	123	128	131	124	46	64	80	66	23	52	123	114	100	93	34	50	103	35	90	84	186	103	89	314	18	53	258	85	2
1955	6	0	102	26	21	80	98	126	130	130	124	51	62	78	72	24	53	122	116	101	127	43	58	113	35	90	84	188	102	90	325	20	59	269	85	2
1956	5	0	96	26	21	83	109	118	127	131	125	52	63	84	69	29	54	122	111	90	125	44	58	122	34	87	85	190	98	90	326	21	60	269	81	2
1957	5	1	99	32	23	82	107	110	120	130	124	51	58	86	73	15	64	215	110	92	125	44	56	129	37	88	81	189	140	87	328	21	69	282	83	3
1958	5	1	27	17	19	76	103	123	136	130	125	56	58	87	75	23	67	216	113	93	126	46	57	124	35	86	89	197	138	89	324	21	68	272	81	3
1959	6	1	92	29	21	84	26	124	137	132	127	63	64	83	69	24	65	216	110	94	127	47	57	125	35	85	85	195	141	80	328	20	64	270	81	1
1960	6	1	25	26	20	85	25	119	130	126	124	51	65	100	69	42	67	220	102	73	126	74	58	122	35	81	65	191	144	85	337	21	66	270	83	2
1961	6	1	23	29	22	84	26	139	182	134	113	57	60	93	65	51	66	225	108	79	118	77	53	123	38	76	75	199	142	91	327	20	66	267	80	2
1962	6	1	25	26	21	73	25	140	170	133	122	55	60	67	64	54	68	223	132	89	118	70	55	121	37	67	84	190	151	91	318	21	69	255	78	2
1963	6	1	24	29	19	59	25	143	170	132	118	58	59	73	65	34	65	223	133	94	116	76	49	108	34	55	83	196	144	90	318	20	69	256	77	2
1964	5	1	24	16	16	40	54	142	197	119	99	42	66	71	65	34	67	225	128	96	121	76	59	121	24	60	78	96	148	67	322	19	72	255	78	2
1965	5	3	24	26	17	44	29	156	217	144	133	65	71	70	70	35	68	202	135	99	110	58	46	89	26	57	83	99	75	60	205	20	71	239	79	5
1966	6	30	61	28	17	53	27	161	210	136	126	57	13	64	60	58	67	226	129	83	127	69	37	90	26	65	80	101	75	62	344	20	65	217	77	4
1967	7	3	54	27	18	48	102	157	189	127	123	55	15	66	71	61	66	169	114	69	127	69	37	93	26	45	66	94	57	65	322	21	66	219	73	3
1968	7	31	55	27	17	41	29	170	169	105	98	54	54	57	72	60	71	200	137	92	104	54	46	91	36	56	75	187	170	106	336	20	67	204	83	4
1969	7	40	26	27	15	33	27	160	162	137	133	56	54	62	73	65	66	219	118	73	79	75	46	107	35	72	60	192	183	105	338	22	71	229	79	4
1970	6	3	16	27	13	32	138	164	164	131	131	58	49	62	71	33	70	218	69	47	113	89	60	113	38	76	41	191	179	103	338	21	75	245	75	4
1971	7	12	30	28	40	32	115	54	14	137	136	59	79	8	81	32	138	284	85	59	143	91	60	120	36	76	34	198	153	89	333	22	99	259	74	4
1972	7	11	28	26	41	21	25	50	17	145	140	65	70	38	80	34	134	259	107	70	147	90	50	125	40	73	63	222	189	105	327	37	75	260	82	3
1973	7	10	30	28	37	24	128	54	16	137	136	60	65	72	79	32	134	264	119	55	155	93	60	121	38	76	63	201	169	98	350	42	119	301	70	3
1974	7	10	29	29	39	26	155	90	249	137	134	56	65	79	79	30	133	261	118	50	150	87	62	119	43	80	69	221	191	103	351	36	107	289	75	3

Table 3. Number of stations used for each year to get the subdivision values (Contd)

YEAR/SD NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
1975	7	9	34	29	42	23	127	191	287	135	135	56	65	78	79	32	130	257	127	58	147	88	63	123	43	81	71	190	166	102	358	25	72	247	75	3	
1976	6	23	66	26	48	21	98	186	274	142	138	59	68	84	78	31	131	254	128	58	152	91	54	119	50	78	74	193	156	106	350	44	113	277	77	4	
1977	7	26	70	29	50	22	89	124	245	140	135	53	71	89	63	30	157	345	125	61	158	89	52	120	44	76	67	203	176	110	343	25	76	269	79	4	
1978	7	27	72	17	50	24	109	131	242	133	114	46	69	92	62	33	98	314	130	63	152	83	52	121	39	77	63	205	185	110	344	27	124	267	59	4	
1979	6	27	70	19	45	22	138	139	256	141	124	57	66	89	58	35	111	286	133	62	142	93	65	118	42	77	68	201	170	107	338	42	84	290	55	4	
1980	7	28	66	18	40	21	52	135	281	147	136	52	68	90	67	32	101	303	126	54	159	110	54	122	43	80	70	164	108	338	44	123	307	54	3		
1981	7	27	85	19	45	19	122	106	255	137	120	50	70	93	64	34	86	288	124	57	153	106	64	114	46	74	64	225	178	136	376	103	276	497	49	2	
1982	7	27	88	15	35	35	114	130	262	137	114	50	71	91	63	35	88	276	127	71	142	105	61	118	48	79	59	234	167	126	377	99	221	367	54	2	
1983	7	26	85	18	15	36	117	133	271	28	22	24	68	86	65	19	85	242	125	69	142	100	61	111	40	75	63	216	158	125	375	102	266	428	87	2	
1984	6	25	94	5	18	35	157	137	258	27	23	21	67	85	57	20	93	266	110	83	141	98	60	119	44	66	62	213	173	125	380	95	254	478	41	2	
1985	8	26	92	19	28	36	153	124	267	140	120	52	53	90	64	19	84	243	127	93	148	105	60	106	43	72	71	197	172	97	316	97	249	484	58	2	
1986	8	27	96	32	32	37	151	152	340	137	114	49	51	86	64	16	71	221	127	88	147	109	55	114	41	87	73	199	161	93	288	97	252	472	63	2	
1987	8	9	88	31	26	38	152	132	309	141	117	48	49	85	66	16	66	207	131	95	141	94	62	120	48	89	68	184	155	100	356	92	275	488	26	2	
1988	6	8	47	32	27	36	152	117	263	136	112	44	50	90	68	14	72	224	164	119	145	101	56	127	49	85	78	212	175	119	461	120	338	581	27	2	
1989	8	7	46	29	25	20	158	191	387	141	109	39	45	89	60	12	70	217	172	121	141	107	58	96	38	80	93	512	500	280	360	112	350	583	22	2	
1990	8	9	53	38	27	29	163	125	236	142	113	42	58	87	63	15	71	223	171	130	151	105	58	119	49	108	101	206	136	115	400	123	391	573	63	3	
1991	7	9	162	40	37	57	366	183	396	138	115	47	67	85	75	12	73	226	172	139	20	107	62	111	52	124	87	456	508	302	406	118	373	608	63	3	
1992	7	9	173	40	49	49	353	185	407	137	111	46	68	82	65	18	67	213	151	116	156	119	62	122	52	122	73	493	484	292	425	115	373	595	62	3	
1993	7	10	175	42	42	39	73	194	409	124	101	16	73	83	78	25	84	240	170	127	168	112	61	126	53	128	89	508	477	293	459	118	374	576	63	3	
1994	6	10	171	34	42	36	74	181	354	117	102	15	72	89	71	30	76	245	175	128	169	118	62	125	54	129	86	520	468	268	491	116	367	584	63	3	
1995	8	10	163	35	30	29	70	183	384	110	100	14	72	83	60	20	77	244	176	118	143	91	60	123	55	131	86	325	385	201	494	118	350	517	63	3	
1996	7	10	165	38	30	33	83	173	379	152	124	55	72	85	59	19	41	99	178	121	174	103	62	123	52	124	80	351	399	207	485	114	357	562	63	2	
1997	5	11	152	41	45	41	94	183	374	184	131	72	72	81	58	19	27	66	184	122	157	109	59	117	53	127	87	354	405	213	534	116	256	458	53	2	
1998	3	10	160	45	42	40	94	182	343	184	130	66	72	82	60	22	37	71	180	122	170	109	60	128	74	138	83	349	388	205	477	106	349	550	53	2	
1999	7	11	158	55	47	44	73	170	334	157	125	55	76	84	60	23	35	77	172	123	26	13	65	127	68	107	81	356	403	211	456	117	354	473	53	2	
2000	3	12	143	54	44	44	62	172	310	171	131	51	73	83	60	22	44	90	145	103	9	13	39	118	71	103	50	358	406	214	477	108	349	478	50	2	
2001	6	13	135	59	50	53	69	171	284	137	101	17	75	83	69	21	8	14	180	126	142	92	65	126	71	134	14	342	386	205	555	110	341	509	49	2	
2002	4	12	136	62	51	33	72	159	250	140	98	16	72	84	74	21	9	20	176	126	137	91	65	114	71	136	14	342	388	205	484	115	346	519	48	3	
2003	4	13	62	58	49	30	65	189	227	139	98	19	70	10	77	21	10	18	176	125	138	89	66	111	71	136	12	342	390	204	492	113	203	447	48	3	
2004	4	13	63	60	50	31	60	216	205	185	135	19	76	10	19	20	9	18	163	117	25	11	66	125	71	134	10	341	391	204	499	5	9	11	48	3	
2005	3	11	60	32	29	30	20	43	266	192	139	15	77	11	19	0	9	17	27	22	25	10	19	15	5	14	12	341	387	203	32	5	8	11	11	3	
2006	0	7	37	0	22	16	17	16	317	191	128	7	0	0	0	0	6	5	15	14	7	10	12	9	5	9	12	14	9	6	32	0	0	0	0	0	
2007	0	0	0	0	21	0	0	0	0	181	116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	0
2008	0	0	0	0	0	0	0	0	0	180	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67	0
2009	0	0	0	0	0	0	0	0	0	179	116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	0

Table 3. Number of stations used for each year to get the subdivision values

Time Scale	Mean		Median		Mode		Maximum		Minimum	
	IMD	New	IMD	New	IMD	New	IMD	New	IMD	New
January	19.1	19.4	16.8	18.2	15.4	16	56.4 (1943)	56.8 (1943)	4.3 (1914)	4.4 (1946)
February	22.3	22.7	21.1	21.8	28.9	9.8	51.8 (1937)	50.6 (1937)	3 (1960)	2.7 (1960)
March	26.6	27.8	23.2	25.3	18.6	19	61.5 (1967)	63.3 (1967)	6.9 (1909)	6.6 (1909)
April	37.9	38.1	37.6	37.1	37.1	31	70.5 (1977)	68.3 (1977)	12.8 (1999)	15.8 (1906)
May	62.3	63.0	59.5	59.5	58.6	59.4	117 (1990)	112.9 (1990)	31.3 (1907)	32.7 (1907)
June	168.3	169.4	167.4	168	126.2	191.3	277 (1938)	273.4 (1938)	87.4 (1905)	93.7 (1905)
July	295.5	290.9	297.1	294.1	326.3	284.9	382.7 (1988)	375.5 (1959)	146.2 (2002)	143.8 (2002)
August	261.9	256.7	260.2	254.3	303.7	274	347 (1926)	330.5 (1926)	188.8 (1913)	191.6 (1920)
September	173.7	171.6	173.6	171.7	173.7	171.7	285.6 (1917)	278.1 (1917)	94.4 (1907)	95.4 (1907)
October	78.9	77.3	71.3	70.5	67.7	69.8	159.2 (1917)	161.3 (1917)	20.4 (1918)	19.5 (1918)
November	30.7	29.7	27.5	26	10.9	29.4	77.8 (1979)	76.1 (1979)	3.6 (1954)	3.6 (1954)
December	15.7	14.8	14.9	14.4	4.9	16.1	58.5 (1997)	56.1 (1967)	1.7 (1939)	1.6 (1970)
January- February	41.1	41.3	40.3	41.9	37.3	24.7	74.2 (1901)	74.9 (1954)	10.6 (1902)	11.6 (1902)
March- May	126.4	127.8	124.5	124.6	109.2	107.3	226.8 (1990)	210.7 (1990)	80 (1910)	83.5 (1910)
June- September	897.6	889.3	905.4	895.7	953.2	965.2	1122.8 (1917)	1084.3 (1917)	693.5 (1972)	674.3 (1972)
October-December	124.6	121.2	120.3	120.9	139.7	152.7	213.8 (1956)	206.1 (1956)	52.4 (1908)	52.7 (1908)
Annual	1193.0	1182.0	1195.1	1189.5	1030.5	1030.8	1503.5 (1917)	1463.9 (1917)	963.5 (1905)	935.9 (2002)

Table 4. Comparison of the descriptive statistics between the new series and the existing IMD series of all India rainfall

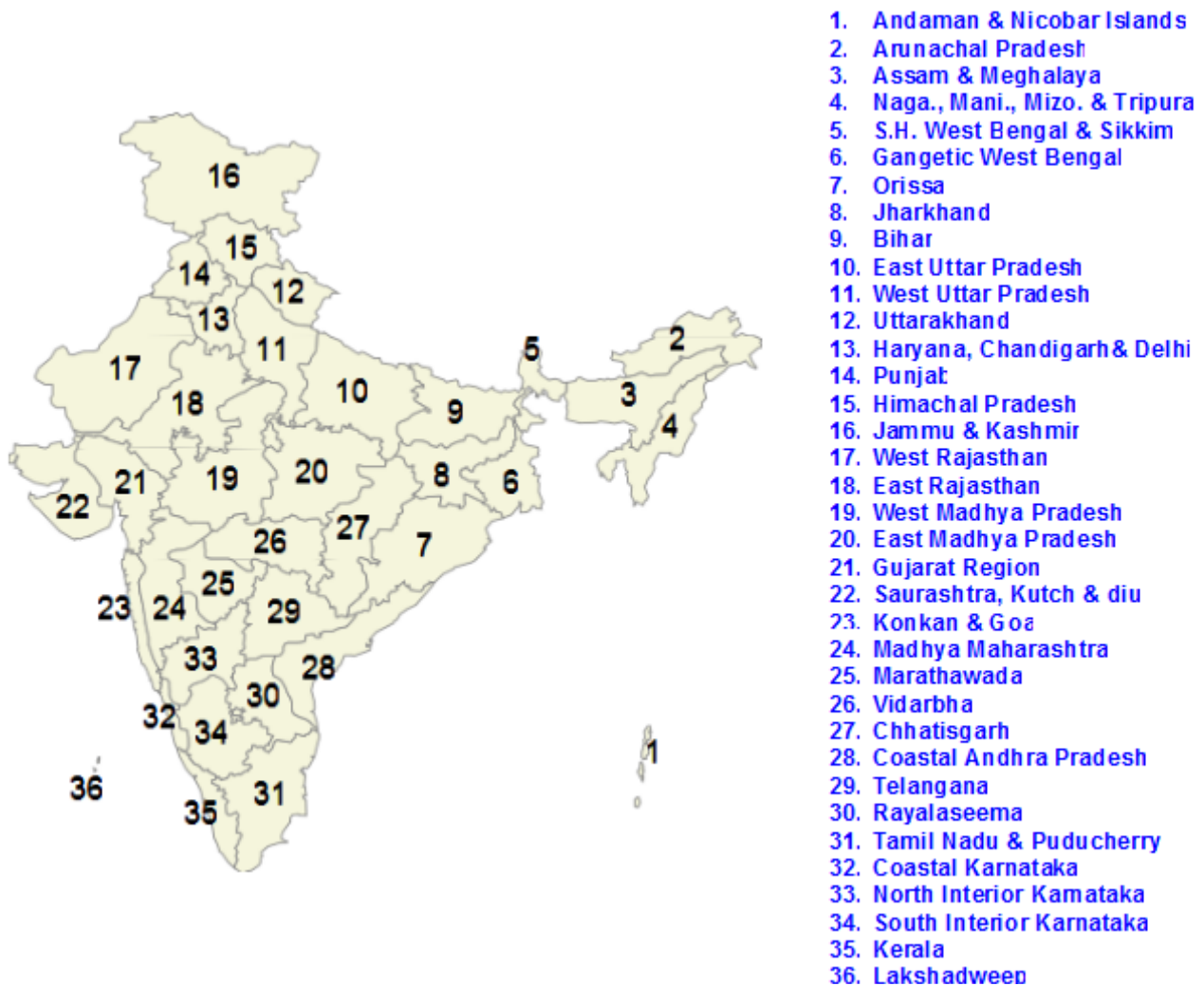


Fig. 1. Name and location of meteorological sub-divisions of India

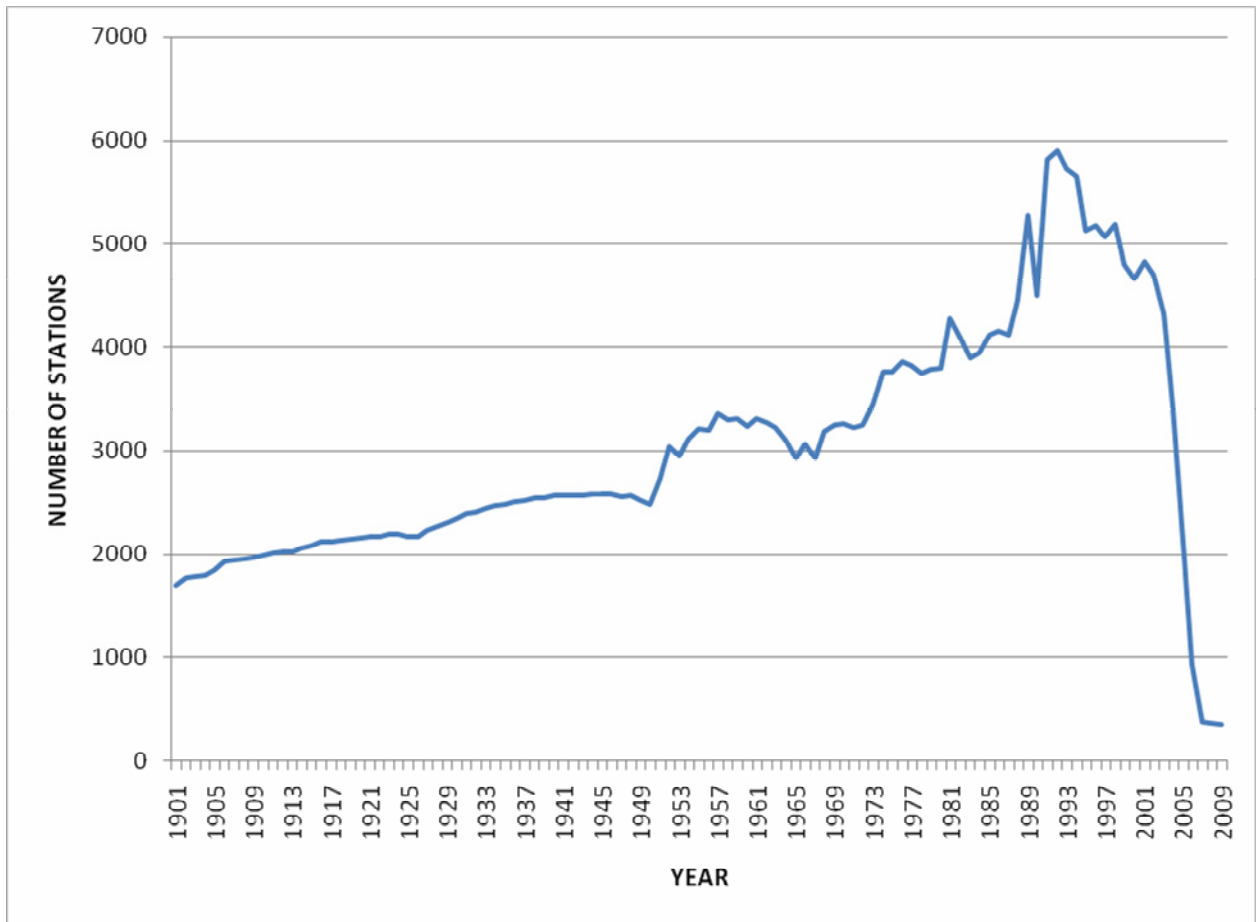


Fig. 2. Yearly frequency of number of raingauge stations for the country

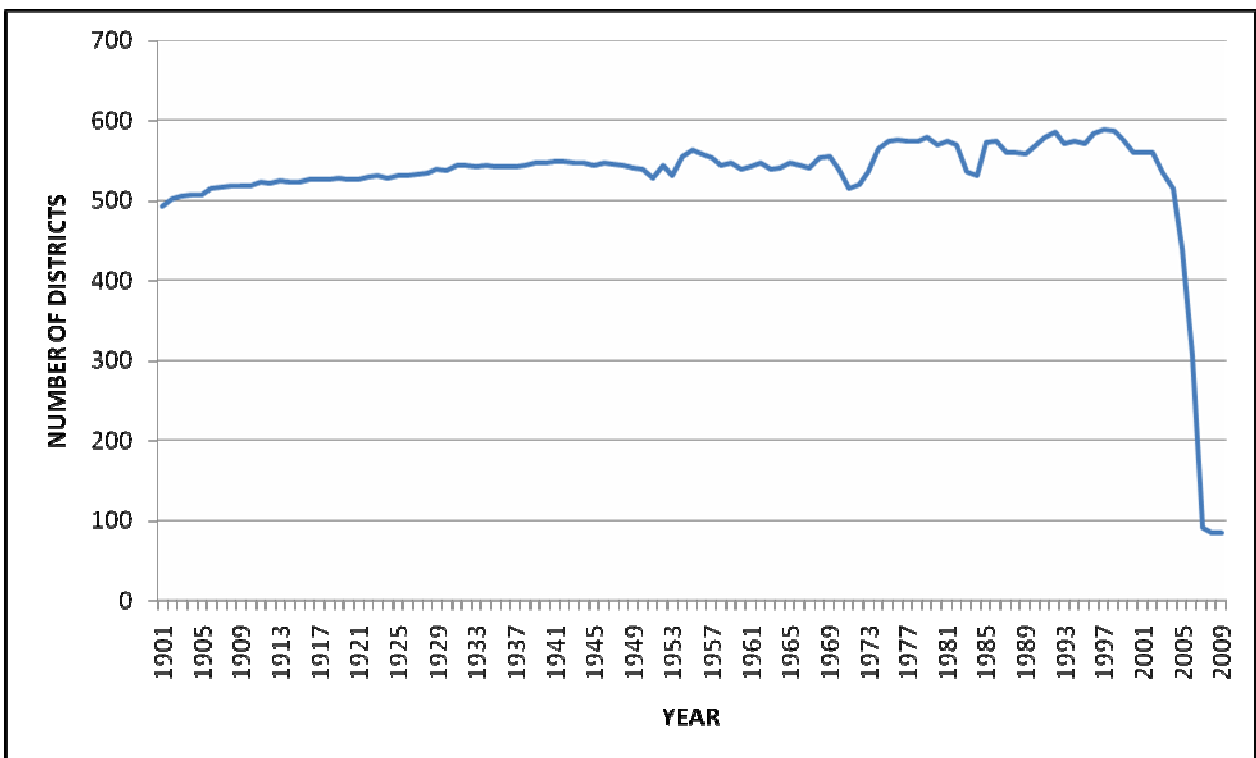
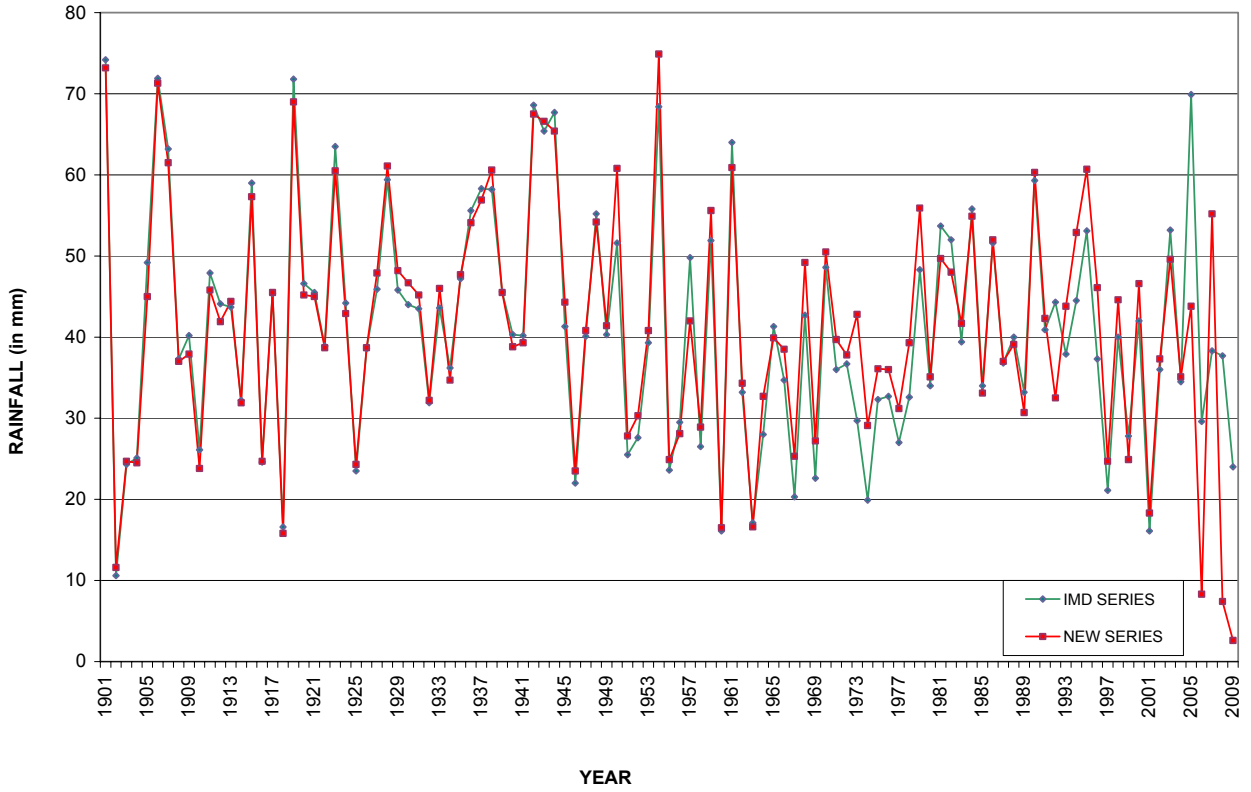


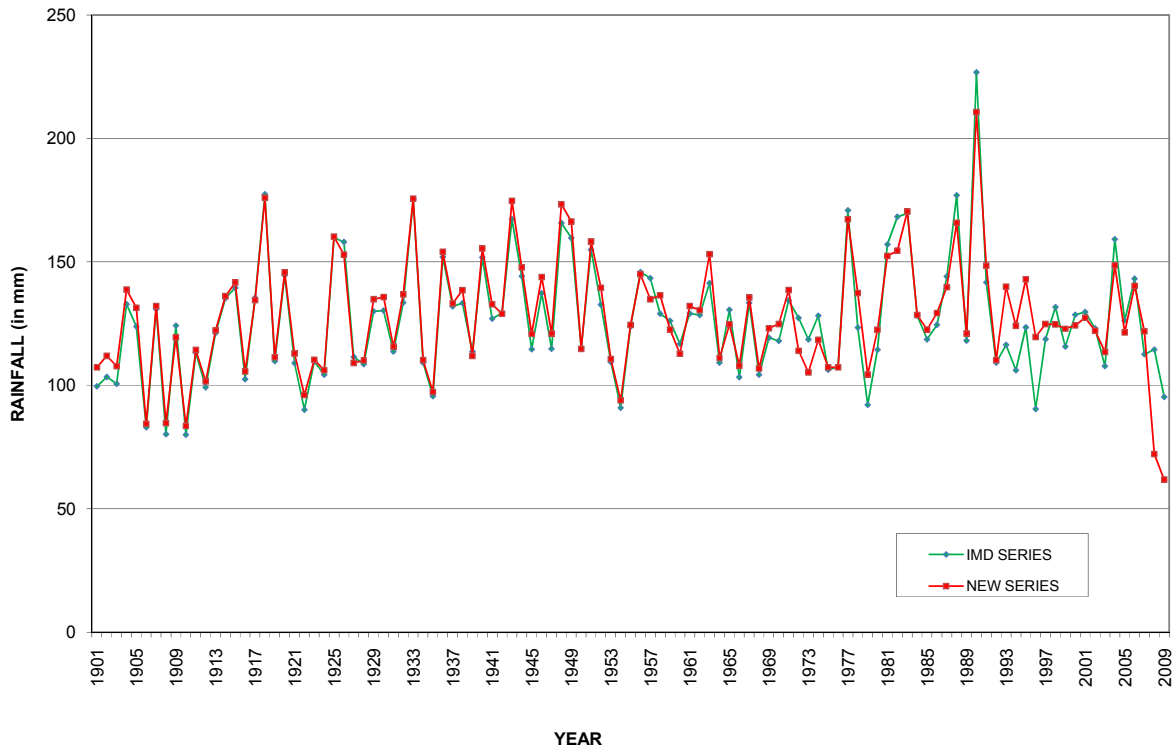
Fig. 3. Yearly frequency of number of districts for the country

JAN - FEB



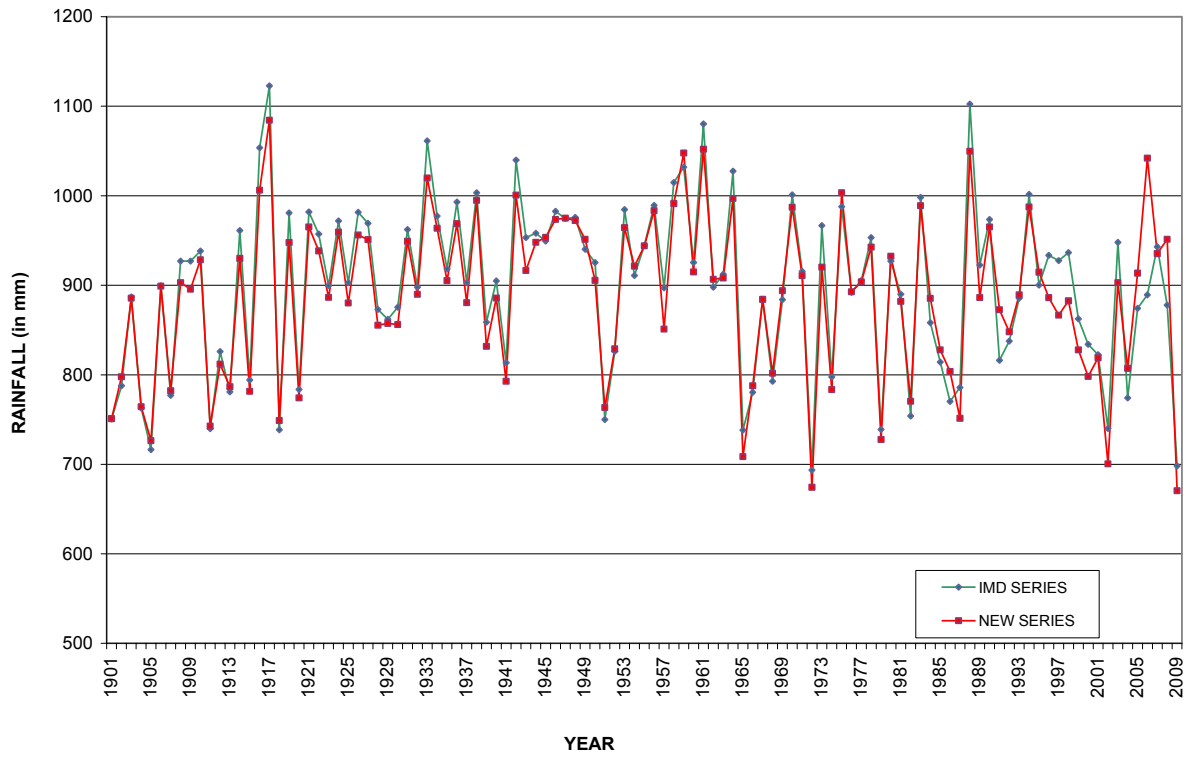
(a)

MARCH - MAY



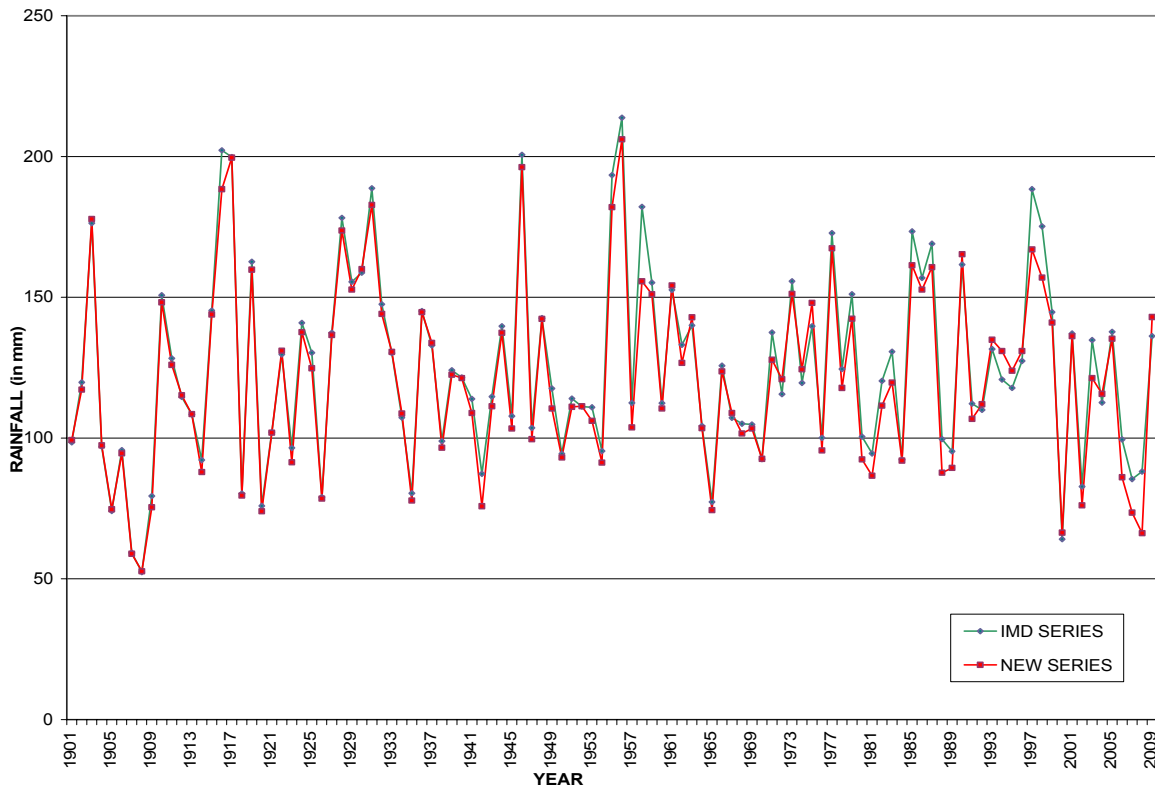
(b)

JUNE - SEPTEMBER



(c)

OCTOBER - DECEMBER



(d)

Fig. 4. Comparison of the seasonal rainfall between the new rainfall series and existing rainfall series of IMD.

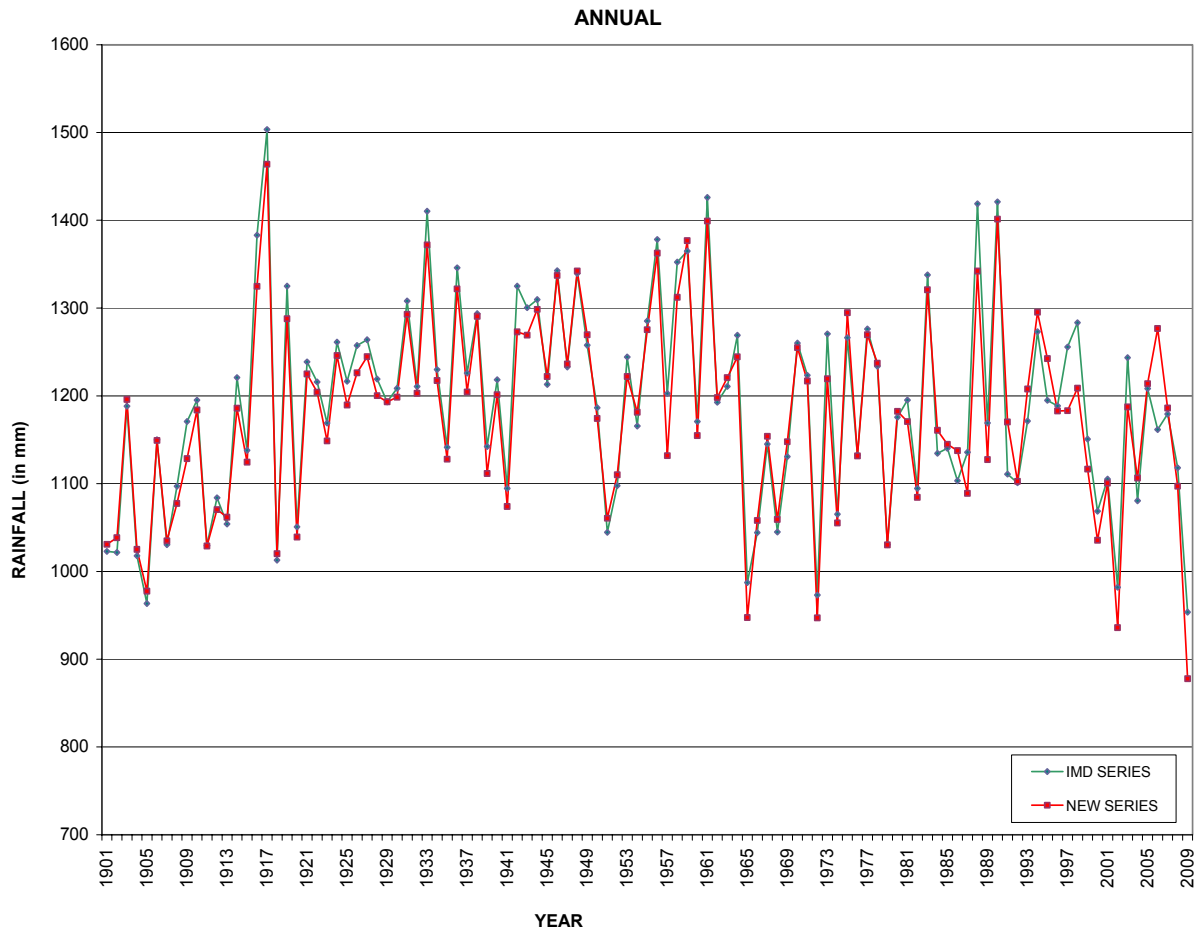


Fig. 5. Comparison of the annual rainfall between the new rainfall series and existing rainfall series of IMD.

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