THE CHANGING BEHAVIOUR OF DECADAL MONTHLY MEAN RAINFALL DURING THE HALF CENTURY (1938-87) AT BANGALORE

Of the many meteorological parameters which influence the life of man, rainfall is one of the most important. At times it becomes a critical factor either because of its shortage or excess, in some part of the country or the other. The normal rainfall pattern of a place indicates the average likelihood rainfall of that place taken either weekwise, monthwise or seasonwise, over a large number of years. India Meteorological Department, publishes (1961, 1967) climatological tables periodically, covering the entire country. Prasad and Rao (1979) have reported a highly variable time series of rainfall with no secular trend in most part of our country. In the present communication the changing behaviour of decadal monthly mean rainfall of Bangalore during the latest fifty years (1938-87) has been described.

The monthly rainfall values of Bangalore were collected from IMD publications mentioned above and some values were personally collected from the central observatory, to cover the latest period of fifty years. The monthly mean rainfall, standard deviation and coefficient of variation were worked out for the above mentioned period of five decades, and the values are given in Table 1.

It is evident from this table that the coefficient of variation is generally high during the first four months of the year, as also during the last two months of every year, in all the five decades. The coefficient of variation is comparatively low during the SW monsoon season of June to September, as expected because the amount of rainfall is more in this period. Normally Bangalore gets thundershowers during the summer period of April & May and this table shows that out of these two months the rainfall of May is more reliable as coefficient of variation is comparatively less than that of April. Hence the rainfall of May could be utilised for the preparation of land etc for the ensuing kharif season, in and around Bangalore. With a certain amount of risk this rainfall could also be used for raising short duration crops during April and May.

As far as the rainfall of NE monsoon in concerned, it is clear that the variation, becomes increasingly more, as we proceed from October, November to December. The annual rainfall pattern of Bangalore is bi-modal with one peak during May and the other peak, which is more conspicuous, in the month of September. But the above table exhibits the highest peak during the month of October for the first three decades, namely, 1938-47, 1948-57 and 1958-67 whereas during the last two decades, i.e., 1968-77 and 1978-87 the peak has been shifted from October to September. Statistical tests for equality of means have shown that this shift is significant at five per cent significance level. This is an interesting change.

LETTERS TO THE EDITOR

TABLE 1

Decadal variation of mean monthly rainfall during the latest five decades at Bangalore

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Decade 1938-47													
Mean monthly rainfall (mm)	4.8	4.9	7.0	71.8	104.3	90.0	88.6	138.4	131.1	166.9	61.7	18.4	888.9
Standard deviation	6.4	13.7	8.2	55.7	53.6	33.5	41.9	97.6	50.4	100.4	53.2	25.8	163.7
Coefficient of variation	133.6	277.9	116.5	77.7	51.4	36.9	47.3	70.5	38.5	60.1	86.2	140.0	18.4
Decade 1948-57													
Mean monthly rainfall (mm)	2.9	8.6	8.3	33.9	105.2	74.2	172.7	153.9	132.4	195.1	35.1	19.0	941.1
Standard deviation	5.0	18.5	21.4	38.6	46.3	38.9	64.6	67.8	74.7	115.0	45.8	26.5	159.0
Coefficient of variation	172.4	215.1	257.3	113.8	44.0	52.4	37.4	44.1	56.4	58.9	130.5	139.4	16.9
Decade 1958-67													
Mean monthly rainfall (mm)	4.4	8.3	5.1	57.2	135.1	86.9	92.3	147.1	186.4	198.9	59.8	14.5	996.9
Standard deviation	3.8	21.2	7.4	44.4	70.3	21.0	71.2	74.5	66.7	123.2	53.3	26.2	163.9
Coefficient of variation	85.3	255.8	145.5	77.5	52.0	24.2	77.2	50.6	35.8	62.0	89.1	181.0	16.5
Decade 1968-77													
Mean monthly rainfall (mm)	2.3	2.5	2.1	35.7	115.6	70.5	97.4	144.0	218.9	155.6	67.4	37.6	949.4
Standard deviation	6.8	4.5	3.5	32.6	49.4	33.1	46.8	86.7	120.7	66.5	74.8	34.2	159.0
Coefficient of variation	295.8	181.5	166.7	91.4	42.8	46.9	48.0	60.2	55.1	42.8	111.0	90.9	16.8
Decade 1978-87													
Mean monthly rainfall (mm)	0.2	12.5	24.7	34.9	99.0	92.9	112.4	112.8	215.9	123.3	64.7	14.2	907.4
Standard deviation	0.5	18.1	31.4	36.6	30.7	70.9	55.9	42.7	101.4	55.6	51.9	20.6	147.8
Coefficient of variation	240.8	144.8	126.9	104.9	31.0	76.4	49.8	37.9	47.0	45.1	80.2	144.9	16.3

It is also interesting to note from the above table that the coefficient of variation of annual rainfall is almost constant for all the five decades considered in the present study, the highest being 18.4% during 1938-47 and the lowest 16.3% during 1978-87. The highest value of monthly coefficient of variation was observed for January during 1968-77, whereas the lowest value was for June in the decade 1958-67. It is evident from this study that there is no regular trend of either increase or decrease of the annual rainfall during the past fifty years at Bangalore. The year to year variations in the annual rainfall are local and statistically non-significant.

References

India Meteorological Department, 1961, *Rainfall normals of Mysore*, IMD, Pune, p. 178.

India Meteorological Department, 1967, *"Climatological tables"*, p. 159.

Prasad, B. and Rao, A.U., 1979, *Vayu Mandal*, **9**, p. 26.

P. S. KAVI

College of Agricultural Engineering,
Raichur-584 101

15 November 1988