PREDICTION OF RAINFALL AT PATTAMBI

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The objective of this paper is to predict the monthly and annual amounts of precipitation and also the number of rainy days at Pattambi, in Palghat District, Kerala State, during a normal year, by using the point estimate, namely the arithmetic mean and interval estimates based on different levels of probability.

Materials and Methods

Records of monthly rainfall and number of rainy days per month maintained at the Rice Research Station, Pattambi for the period 1927-76 have been utilised for this study. The point estimate, namely, the arithmetic mean of monthly and annual precipitation have been worked out. For getting interval estimates, the percentile values namely P_{10}, P_{25}, P_{50}, P_{7}, $\cdot$ P_{90} are computed. P denotes the value of the variate such that $a\%$ of the fre lies below it and $(100-a)\%$ of the frequency lies above it. Thus the $(100-2a)\%$ confidence interval is formed by taking P_a P_{100-a} as the boundaries. In this way it is possible tc work out the 80% and 50% confidence limits for monthly and annual amounts of precipitation and also for number of rainy days pe month and per year. Similarly one can state with confidence of $(100-a)\%$ that the variate-rain fall or number of rainy days-will take values below P_{100-a} or above P_a.

Results and Discussion

The mean annual precipitation at Pattambi is found to be 2606.3mm and the standard deviation of the amount of precipitation is 536.05 mm, The mean number of rainy days per year is 118.24 and the standard deviation is 13·52 days. The mean values of monthly amounts of precipitation and number of days are given in Table 1. The frequency distributions of annual amount of rainfall and annual number of rainy days are given in tables 2 (a) and 2 (b). It is found that the distributions obey the normal probability law. Hence the percentiles can be estimated by using the tables of normal probability integral· (Fisher & Yates. 1957.)

The monthly rainfall data and the data on number of rainy days per month do not conform to the normal distribution. Hence the percentiles are computed by using the formula, P_a $\left(\dfrac{N.a}{100} \right)^{c}_{f}$ where L is

the lower boundary of the percentile class, N the total frequency, m the cumulative frequency upto the percentile class and c the class interval.

Table 1

Mean monthly rainfall and number of rainy days.

Month	Rainfall (mm)	Number of rainy days.
January	2.87	0.28
February	9,80	0.68
March	17.76	1.28
April	86.38	5.12
May	225 56	9.56
June	632.20	22.54
July	638.36	25.28
August	356.57	19.74
September	191.34	12.46
October	267.58	12.80
November	128.23	6.84
December	29.74	1.66

Table 2 (a)

Distribution of annual rainfall

Rainfall (mm)	No. of years
1534 — 2070	8
2070 — 2606	22
2606 — 3142	13
3142 — 3678	5
3678 — 4214	1
4214 — 4750	J
	50

Table 2 (b)

Distribution of annual number of rainy days

No. of rainy days	No. of years
86 — 102	7
102 — 118	18
118—134	17
134 — 150	6
150 — 166	A
	50

The percentile values for annual and monthly precipitation and number of rainy days are given in Table 3.

Table 3.

Percentiles of rainfall data and on number of rainy days.

Percentiles of rainfall data

Annual	1919	2245	2606	2968	3293
January	1	3	5	8	10
February	1	3	7	10	37
March	2	4	8	33	64
April	21	36	81	145	181
May	37	80	150	322	533
June	314	447	579	609	844
July	233	492	667	786	971
August	144	220	320	450	600
September	40	84	167	294	388
October	120	170	267	371	489
November	33	53	113	197	317
December	2	5	9	48	100

Percentiles of data on number of rainy days.

	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}
Annual	98	107	118	129	139
January	0	0	0	0	1
February	0	0	0	1	2
March	0	0	0	2	3
April	2	3	5	7	10
May	3	- 5	8	13	17
June	16	21	2?	25	28
July	20	22	26	28	30
August	13	16	21	24	25
September	4	8	13	17	20
October	7	10	13	16	20
November	2	4	7	10	12
December	0	0	i	2	5

These figures show that with a confidence of 80%, the amount of rainfall that can be expected at Pattambi in a normal year will be between 1919 and 3293 mm. It can also be stated that rainfall at Pattambi during a

normal year will be more than 1919 mm with a confidence of 90% and above 2245 mm with a confidence of 75%. Further it can be seen that the probability of annual rainfall exceeding 3293 mm is only 0.10 and that for exceeding 2968 is 0.25. Similar inferences can be drawn regarding the annual number of rainy days and also for monthly precipitation and number of rainy days per month.

Summary

Based on data relating to monthly and annual amounts of precipitation and also number of rainy days at Pattambi, point estimate 'namely arithmetic mean and interval estimates based on different levels of probability for the monthly well as annual amounts of rainfall and number of rainy days have been computed. These form the estimates for purposes of prediction during a normal year.

സംഗ്രഹം

പട്ടാമ്പിയിൽ, 1927 മുതൽ 1976 വരെയുള്ള കാലഘട്ടത്തിലെ പ്രതിമാസവും വാർഷി കവുമായ വർഷണത്തിന്റെയും വർഷപാതമുള്ള ദിനങ്ങളുടെ സംഖ്യയുടെയും ദത്തങ്ങള ആധാര മാക്കി, ഇവയ്ക്ക് സമാന്തരമാധ്യം എന്ന rat^AfijcD ബിന്ദുവും വിവിധ സാദ്ധ്യതാതലങ്ങള ആസ്പദമാക്കിയുള്ള അന്തരാളാകലനങ്ങളും പരികലനം ചെയ്തിരിക്കന്നു. ഇവ ഒരു പ്രസാ മാന്യവർഷത്തിലെ വർഷണത്തെയും വർഷപാതമുള്ള ദിനങ്ങളുടെ സംഖ്യയെയും പ്രവചിക്കന്ന തിനുള്ള ആകലനങ്ങളാകന്നു.

REFERENCE

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(M.S. Received: 21-3-77)