CHAPTER FIVE

POPULATION ECOLOGY OF PARIAH KITE

a) Population Fluctuations :

The Pariah kite population showed significant fluctuations during the period of investigations in 17 months. The number of kites roosting at all the nine roosts had varying population size in different seasons. Table 2 shows the monthly average number of kites at different roosts and the total number of kites in Kolhapur City during study period. The monthly average values of kites at each roost are also shown graphically in figure 8.

The roost R-I was the largest roost and had kites throughout the year in it. The number ranged from a minimum of 58 kites in February 1987 to the maximum of 364 kites in August 1987, the monthly average number of kites at the roost was 147, which was highest among all the roosts.

Roost R-II had kites only for six months during the investigations i.e. November and December in 1986 and January February, October and November, 1987. The maximum kits were recorded in October 1987 (n = 53) and the minimum values in February 1987 (n = 13). The monthly average number of kites for the study period was only 9 at this roost.

The second largest roost studied was R-III. The monthly average number of kites for the study period was 41 kites, it ranged from a minimum of 33 in December 1986 and a maximum of 71 in March 1988. During July, August and September there were no kites on this roost.

Roost-IV had very few kites, the monthly average values fluctuated from a minimum in April (n = 11) and maximum in

Table 1 : Monthly fluctuations in average values of Pariah kite, Milvus migrans population at nine communal roosts in Kolhapur city.

Year	Month	Number of P.kite at different roosts									Total No.of Kite
		R-I	R-II	R-III	R-IV	R-V	R-VI	R-VII	R-VIII	R-IX	
1986	Nov.	139	30	39	00	--	--	--	--	0	208
	Dec.	105	22	33	00	15	--	--	--	0	175
1987	Jan.	79	18	38	00	12	--	--	--	0	147
	Feb.	58	13	51	00	12	--	--	--	0	134
	Mar.	69	00	62	15	24	--	--	--	0	170
	April	92	00	58	11	20	--	--	--	0	181
	May	130	00	62	12	22	--	--	--	0	226
	June	221	00	40	00	09	--	--	--	0	270
	July	290	00	00	00	04	--	--	--	0	294
	Aug.	364	00	00	00	04	--	--	--	0	368
	Sept.	318	00	00	00	12	--	--	--	0	330
	Oct.	177	53	46	00	00	--	--	--	0	276
	Nov.	98	18	52	00	00	15	35	40	0	258
	Dec.	86	00	47	20	16	12	34	30	0	245
1988	Jan.	78	00	42	16	10	14	30	45	0	235
	Feb.	105	00	60	20	14	00	00	00	0	199
	Mar.	93	00	71	20	22	00	00	00	12	218

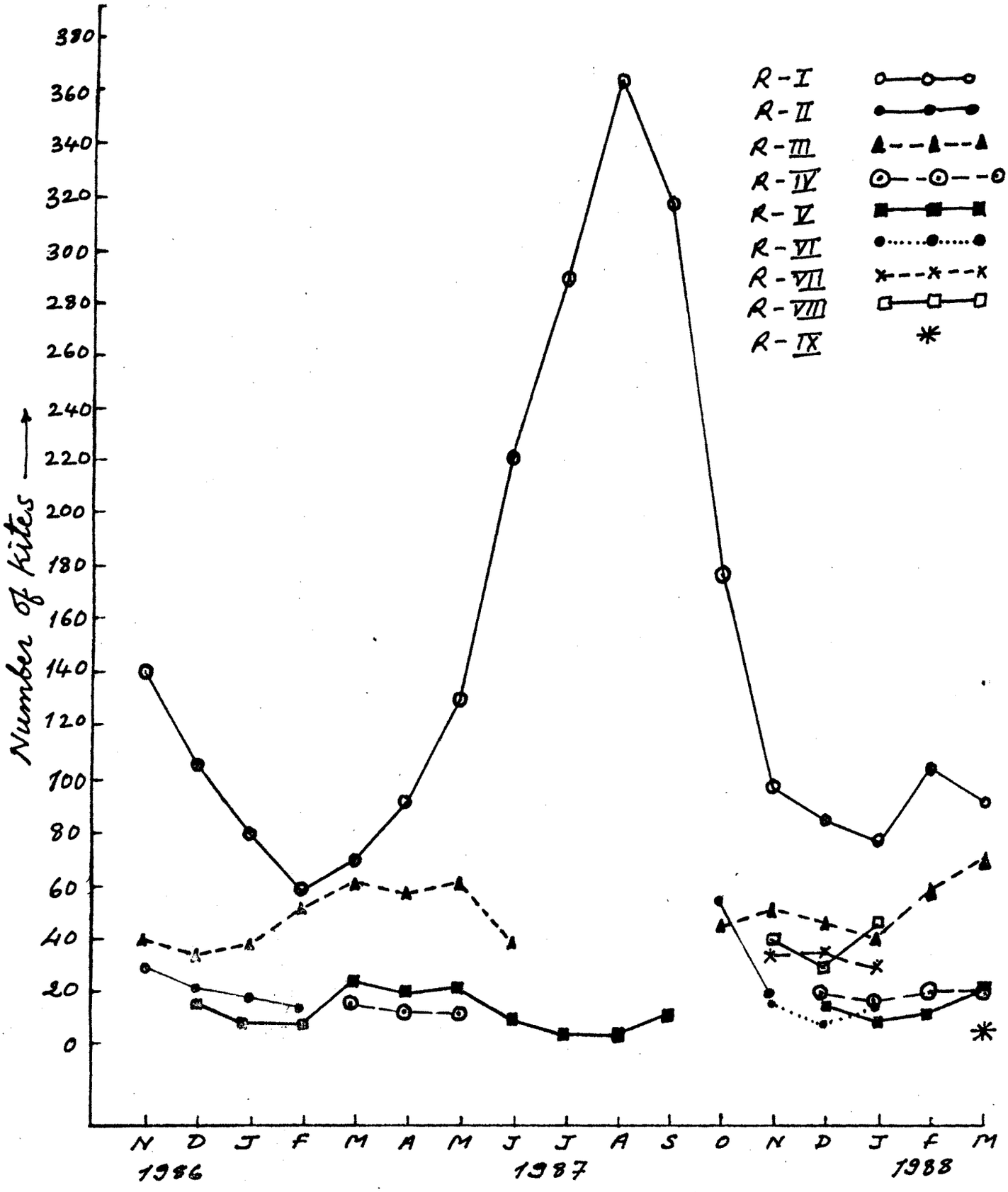

Fig 8 : Monthly average number of Pariah kite, Milvus migrans recorded at nine different roosts in Kolhapur City.

February and March 1988 (n = 20). The annual average number of kites at the roost was merely .7. The roost was abandoned for almost 10 months.

The roost R-V was only second to R-III in duration and occupancy as it was occupied throughout the study period except for two months i.e. October-November 1987. The roost was discovered in December 1986. The average number of kites per month during the period at the roost were 12. The roost had low kite density which was minimum in July-August 1987 (n = 4) and maximum in March 1987 (n = 24).

Roosts R-VI, R-VII and R-VIII were discovered in November 1987 and therefore the kite population in them could not be ascertained. However, the enquiry with people in the neighbourhood revealed that the roosts did not have any kite population earlier. Also at the end of the field observations i.e. during February and March 1988 the roosts were abandonded. During the occupancy the roosts had almost uniform kite populations in November, December 1987 and January 1988. But even for a temporary duration the kite population was significant. The kite population (n = 12) was reported only ones i.e. in March 1988 in roost R-IX.

The total monthly average kite population in the city has been given in the Table 2 and the period of occupancy of roosts is given in fig. 9. It is clear from the figure that R-I was the only permanant roost among all the nine roosts studied. Rest of the roosts were temporary and were occupied for some time only at different durations. Roost R-II and R-IV

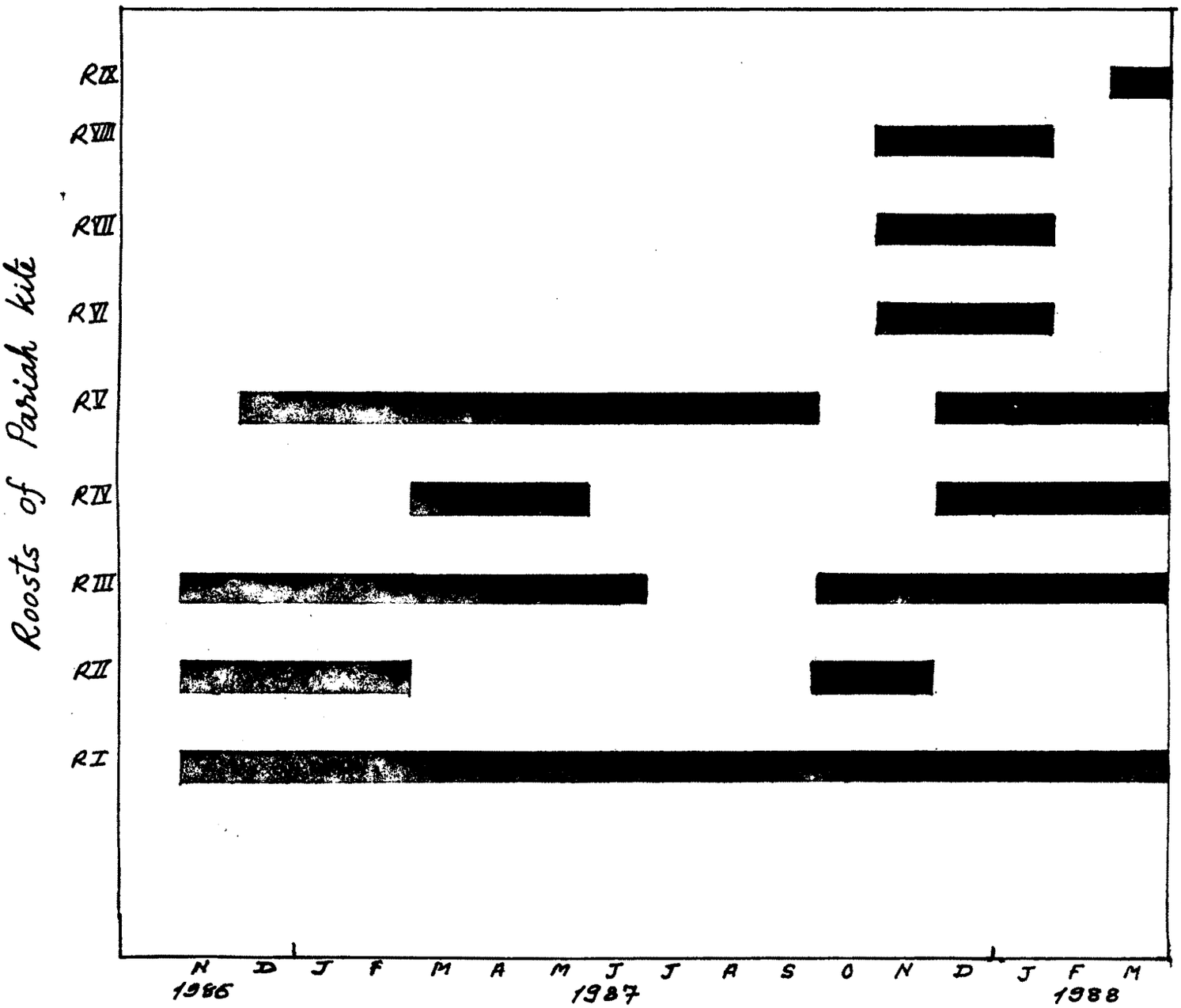

Fig 9 Period of occupation of permanant and temporary roosts of Pariah kite during the study period, November 1986 – March 1988.

were occupied alternately except in the four months of rainy season (June-September). However, it could not be confirmed that the same kites occupied both the roosts at different times. The Roost R-V was occupied for longest duration except in October-November 1987. Interesting observation in this case was even during the monsoon months there were kites in the roost, though in very low numbers.

The fluctuations in the total number of kites in Kolhapur city had clear correlation with the monsoon precipitation (Fig.10). The annual lowest value (n = 134) was recorded in February 1987. Than there was gradual increase in the number of kites till it reached the annual peak (n = 368) in August 1987. The values decreased again to reach the annual minimum of 1988 (n = 199) in February 1988. The annual high values of kite population were recorded in the rainy months of June-September when the rainfall values were also the annual highest. The lowest kite population was recorded in winter months.

It could not be confirmed whether there were outside kites coming and directly occupying a specific roost as the kite population increased in the premonsoon season and monsoon season. It was also observed that there was frequent shifting of kites from a temporary to permanent roost or vice versa or between two or more temporary roosts (Table 2). Because of the similarity in size colour and sexes it was not possible to identify the specific birds possibly using different roosts in different seasons. Perhaps more detail study with colour dyes could give better results in this respect. However the general

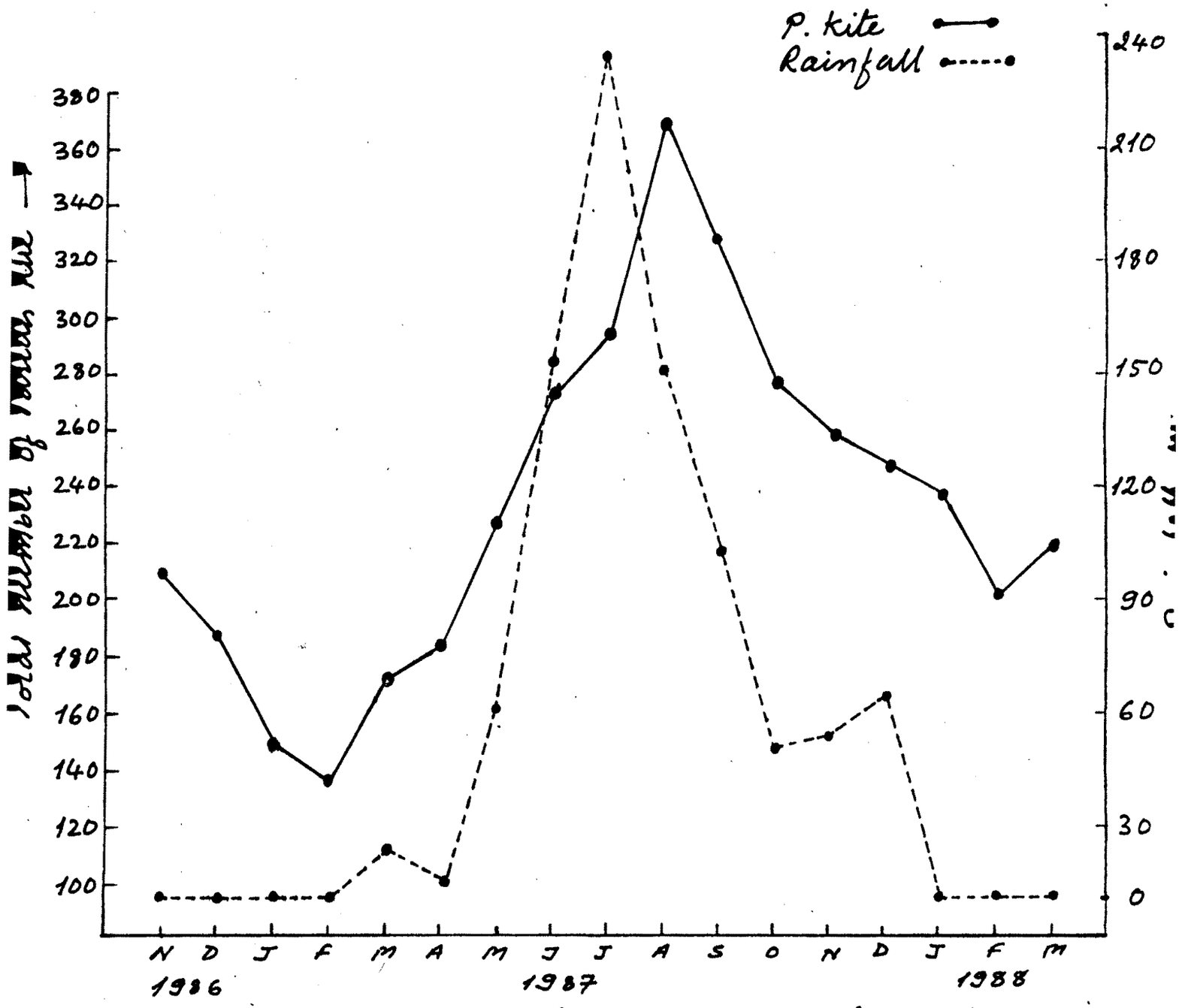

Fig 10: Monthly fluctuations in the total number of Pariah kite and monthly average values of rainfall in Kolhapur City.

impression, after the study, was the shifting of kite population from a temporary roost to the permanent roost was a common phenomenon at least during the four months of monsoon.

Pariah kites appear to have very specific fluctuations in their population, in which breeding plays a major role. Three clearcut seasons were observed which could be correlated to the behaviour, namely pre-breeding season (June to September), breeding season (October to February) and the post-breeding season (March to May). The pre-breeding season had the highest average population in the city (n = 316) which was followed by the post-breeding (n = 192) and breeding i.e. n = 166 and n=243 in the years 1986-87 and 1987-88 respectively. The average monthly kite population of the city during the study period was n = 231.

In order to understand the influence of the various climatic factors on the kite population fluctuations the correlation between monthly average population and the factor was studied. Table 3 gives such eight important correlations.

Temperature played significant role in the fluctuations in kite populations. There was a clear negative correlation with the maximum temperature values i.e. ($r = 0.5311$, $p = .0141$). At the same time there was a positive correlation with the minimum temperature values in the study area ($r = 0.5062$, $P = 0.0191$). Figures 11 and 12 reveal the relationship graphically. However, no correlation could be established between the average temperature values and kite populations ($r = 0.0268$, $P = 0.4594$) (Figure 13).

Table 3 : Correlation between monthly average number of Pariah kite, *Milvus migrans* and the eight important climatic factors studied during the investigations.

Sr. No.	Physical factors	Correlation (r)	Sample size (n)	One-tailed Significance (P)
1.	Maximum temperature	- 0.5311	17	0.0141
2.	Minimum temperature	0.5062	17	0.0191
3.	Average temperature	- 0.0268	17	0.4594
4.	Relative humidity	0.8583	17	0.0000
5.	Hours of sunshine	- 0.8310	17	0.0000
6.	Wind speed	0.3583	17	0.0789
7.	Rainfall	0.7498	17	0.0093
8.	Radiation	0.5633	12	0.0283

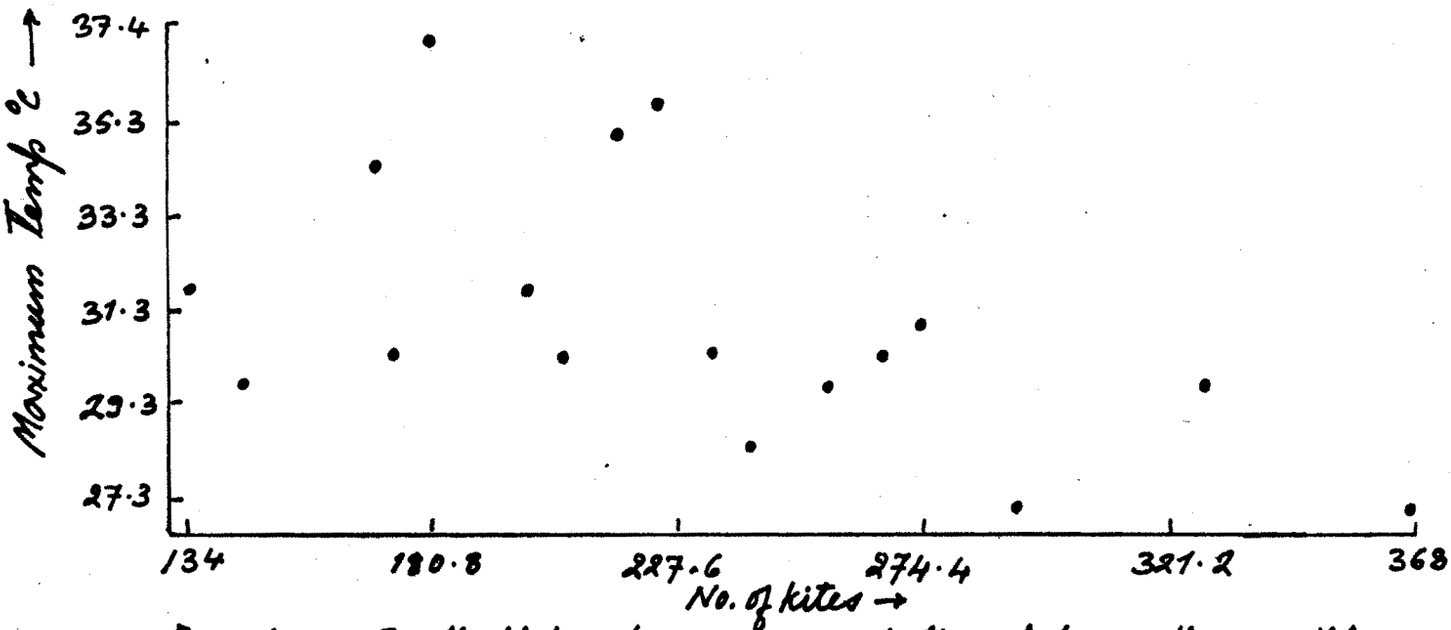

Fig 11 : Scatterplot showing correlation between the monthly average number of kites and maximum temperature.

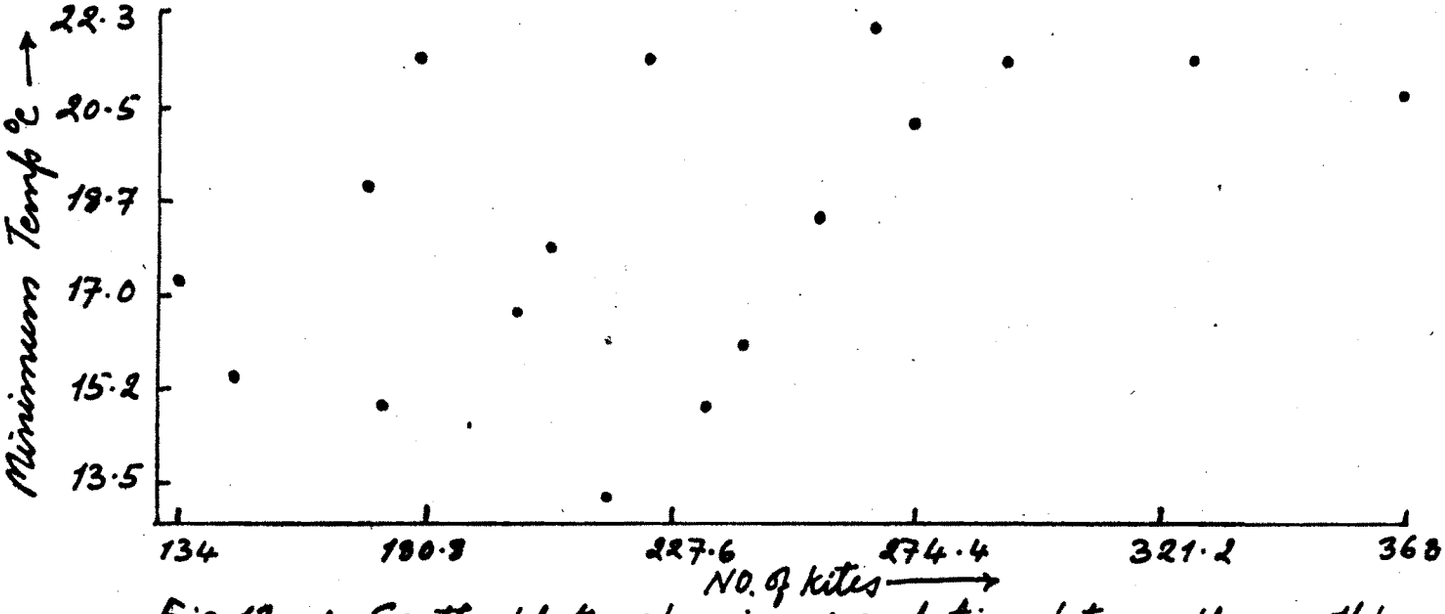

Fig 12 : Scatterplot showing correlation between the monthly average number of kites and minimum temperature.

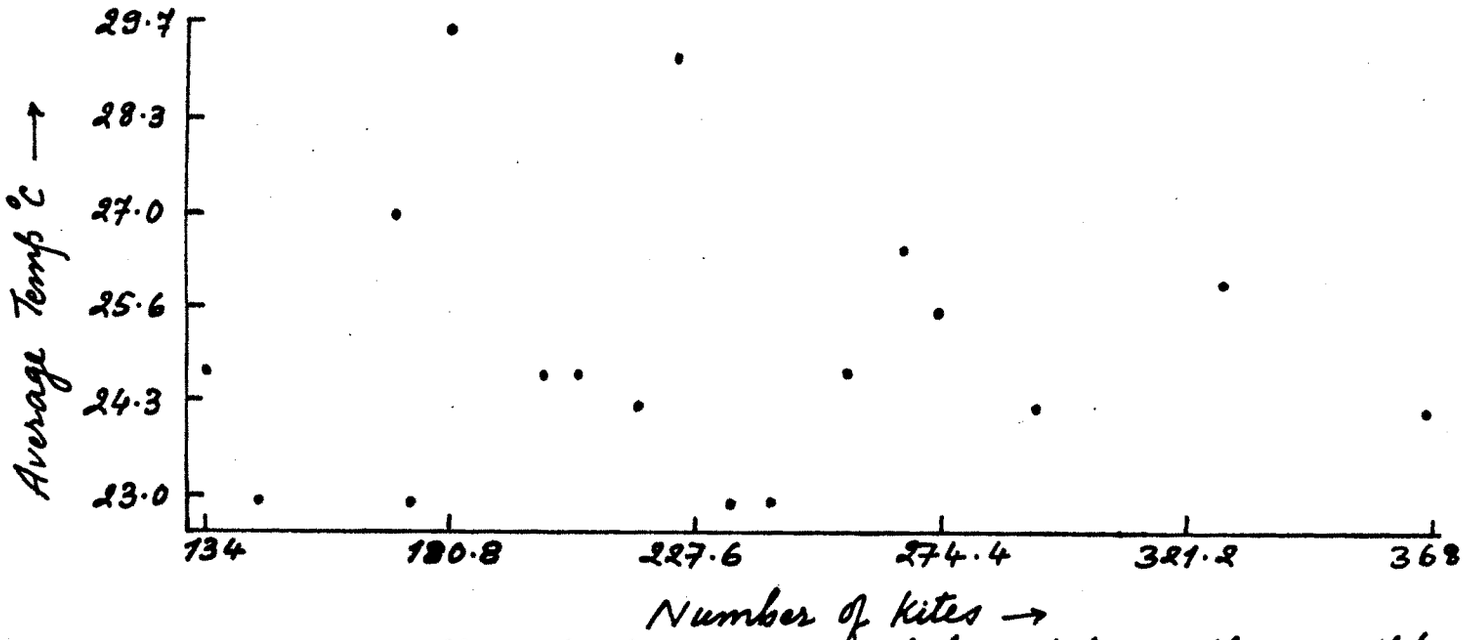

Fig 13: Scatterplot showing correlation between the monthly average number of kites and average temperature.

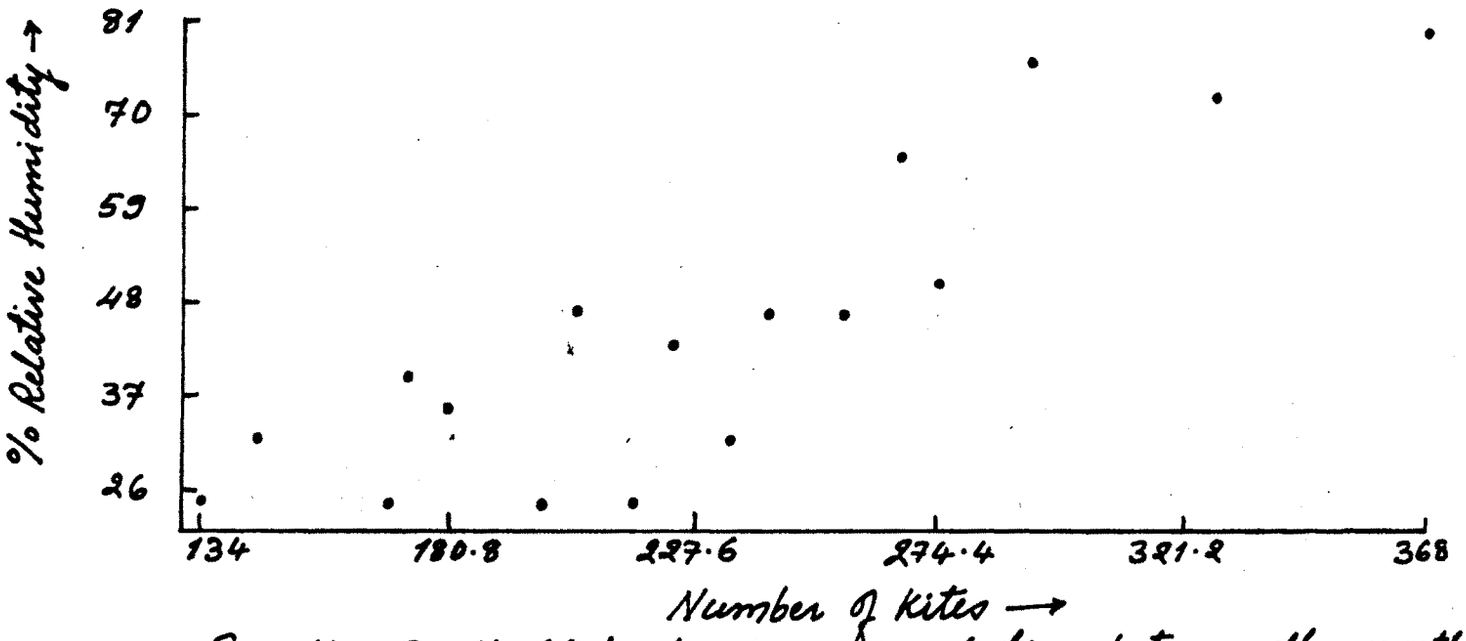

Fig 14: Scatterplot showing correlation between the monthly average number of kites and Relative Humidity.

There was a excelient and positive correlation between the percentage of relative humidity and the fluctuation of kites, ($r = 0.8583$, $P = 0.000$) Figure 14. The hours of Sunshine and the population was negatively correlated with ($r = -0.8310$, $P = 0.000$). This relationship can be nicely seen from figure 15.

There was no significant correlation between the wind speed values recorded in the afternoon and the population ($r = 0.3583$, $P = 0.0789$). The graphical presentation reveals very poor correlation pattern (Figure 16).

Radiation and rainfall had well correlation with the changes in the kite populations in Kolhapur city. The radiation values showed positive correlation ($r = 0.5633$, $P = .0283$) whereas the rainfall values also showed positive and very significant correlation ($r = 0.7498$, $P = 0.000$). Both the correlations have been presented graphically with the help of scatterplots in figures 17 and 18 respectively.

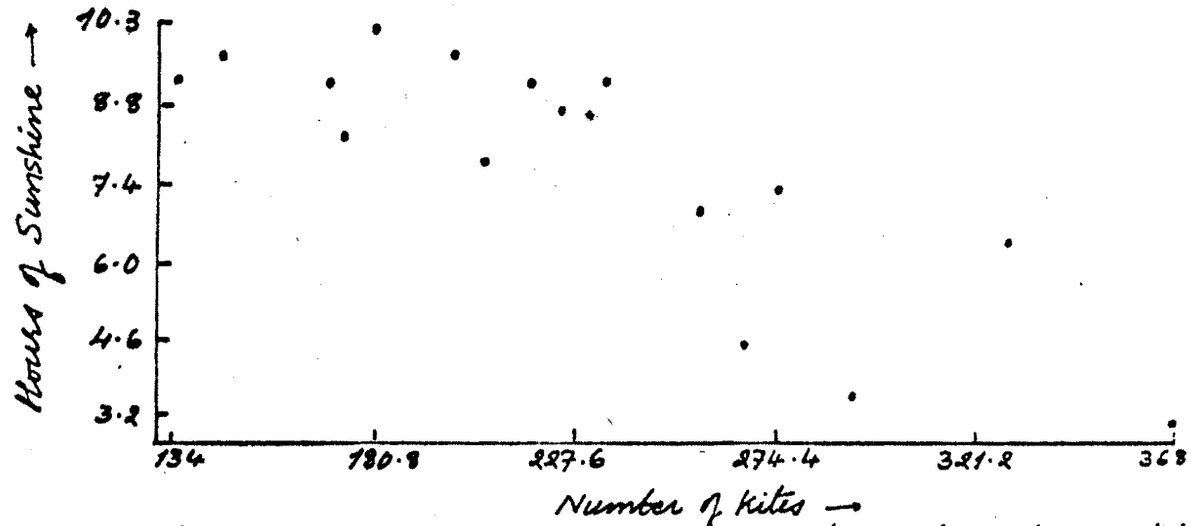

Fig 15: Scatterplot showing correlation between the monthly average number of kites and hours of sunshine.

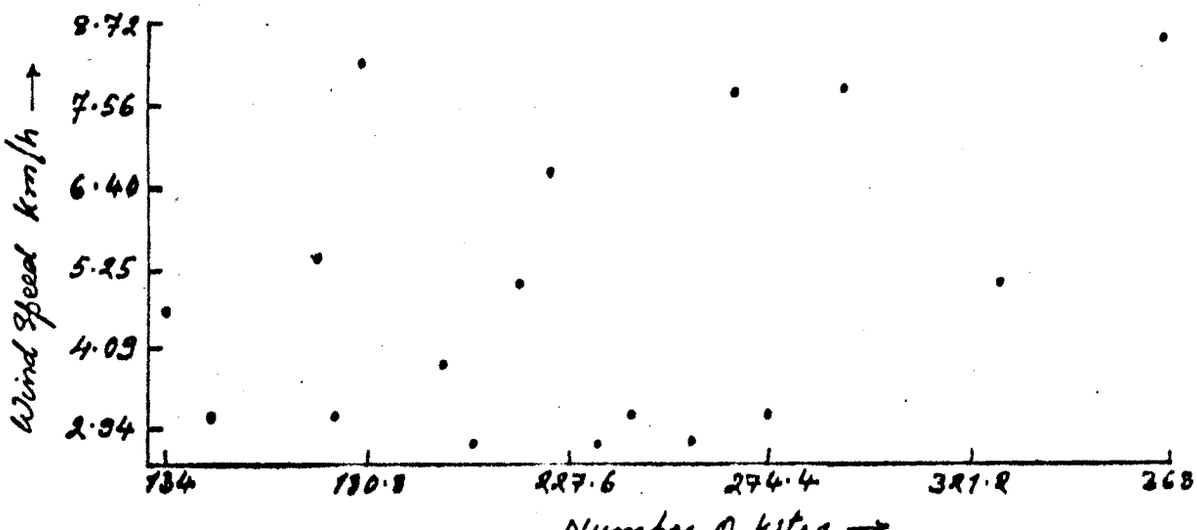

Fig 16: Scatterplot showing correlation between the monthly average number of kites and Wind Speed.

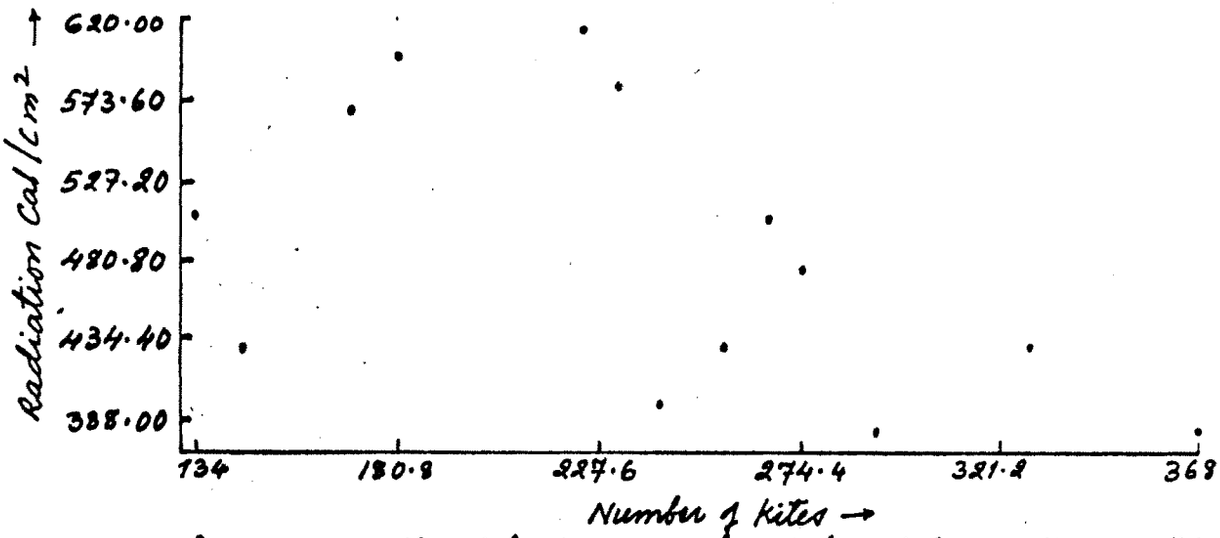

fig 17: Scatterplot showing correlation between the monthly average number of kites and Radiation.

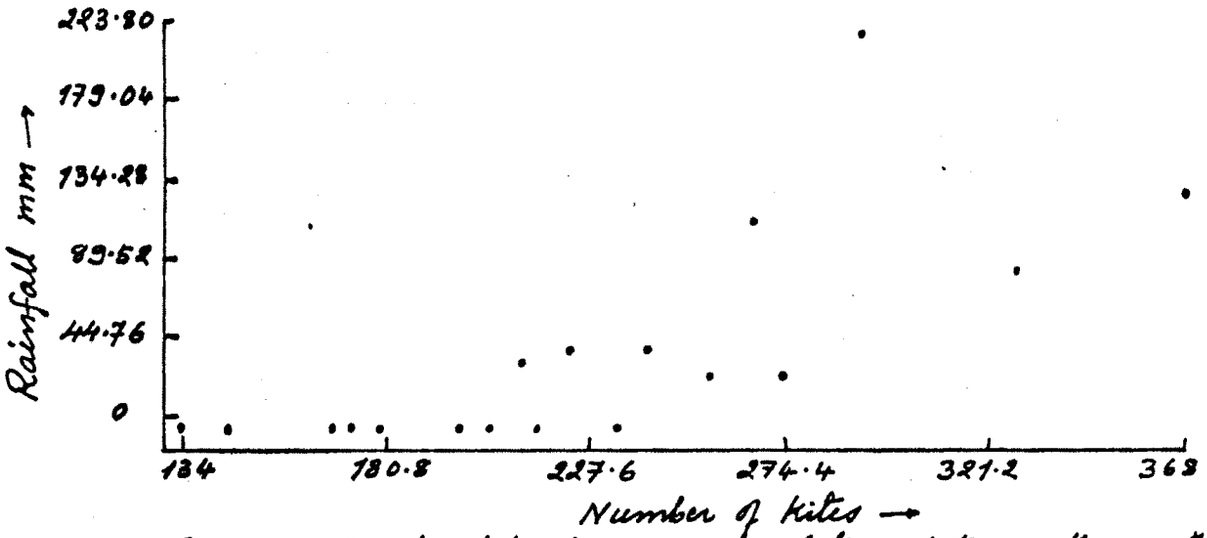

fig 18: Scatterplot showing correlation between the monthly average number of kites and Rainfall.