551.577 : 633.1(541.9)

NFLUENCE OF RAINFALL ON PRODUCTIVITY PERFORMANCE OF PADDY CROP IN ANDAMAN AND NICOBAR ISLANDS

Rainfall is one of the most dominant factors, which plays an important role in growth and development of crop plants. The annual variations in the rainfall in terms of amount and distribution reflects in the productivity performance of rainfed crops. In Andaman and Nicobar islands, paddy is the most important cereal crop occupying about two third of the cultivated land and entirely depends on the rainfall. Irrigation in these islands is almost negligible.

The relationship between crop yields and rainfall was studied extensively by several researchers (Nandkarni and Ghosh 1978, Mruthunjaya *et al.* 1983; Jodha and Purohit 1971) for different parts of the country. But evidence of such study for Andaman and Nicobar islands is almost non-existent. Thus an attempt has been made in this paper to examine the producivitiy performance of paddy in relation to rainfall.

2. *Materials and methods* — Commensurate with the objectives of the study, all the regions, namely, North Andaman, South Andaman, Little Andaman and Great Nicobar were considered.

The monthly rainfall data were collected from meteorological station, Andaman and Nicobar islands, Port Blair for the period of 1968-83. The data on yield per hectare of paddy crop for the same period was obtained from Department of Agriculture, Andaman and Nicobar islands. The relationship between yield per hectare of paddy crop and rainfall was examined by employing following functional form :

$$y = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + \ldots \ldots \quad (1)$$

where,

y = Yield of paddy crop in concerned region (kg/ha).

x_1 = Normal rainfall when rainfall is above normal otherwise actual rainfall (in mm) of concerned region.

x_2 = Difference between actual rainfall and normal rainfall in case of rainfall above normal otherwise it is zero in concerned region and

x_3 = Index of seasonal deviation in rainfall of concerned region.

Index of seasonal deviation may be defined as follows :

$$I = \sqrt{\frac{\overline{x_i^2} \; y_i}{\sqrt{n^2 \times 100}}}$$

where,

I = Index of seasonal deviation.

TABLE 1

Regression equations for the impact of rainfall on productivity per hectare adjusted for trend

Region	Eqn. No.	Regression coefficients of R^2			
		x_1	λ_2	x_3	
North Andaman	(i)	7.2674** (2.6905)	—4.2312* (2.0711)	—	0.4142
	(ii)	8.3688*** (2.6673)	—4.6087* (2.1160)	14.6552** (6.0730)	0.5853
South Andaman	(i)	5.4023* (2.5859)	—18.4280*** (4.7647)	—	0.5998
	(ii)	6.7084** (2.2547)	—27.2281*** (4.8736)	32.0766*** (5.9639)	0.7918
Little Andaman	(i)	8.6770*** (2.1987)	—8.7002** (2.9622)	—	0.5932
	(ii)	8.5541 (2.2967)	—8.7206** (3.0031)	12.4626* (5.6303)	0.6519
Great Nicobar	(i)	6.5786*** (2.1098)	—5.9891** (2.3568)	—	0.5168
	(ii)	9.8122** (3.1148)	—13.6967*** (4.0332)	20.7564* (9.8706)	0.6901

*, **, ***, significant levels at 10, 5 & 1 % respectively.

x_i = Deviation of rainfall in month 'i' from average rainfall in month.

y_i = Average or normal percentage share of month in the total rainfall of the period (one year) for which index is derived.

i = Respective months of the period for which index is derived.

n = When the whole rainfall year is taken. For the present study, crop growing season data were used.

3. *Results and discussion* — The results of regression equations are set out in table. The estimated regression coefficients revealed that the variable x_1 is positive and significant at various levels of significance in all the regions and in both models under study. The variable x_2 is negative and significant at various levels of significance in all the regions and models. The negative sign indicated that excess or above the normal rainfall adversely affected the yield of paddy crop in all the region under studies. The impact of seasonal deviation of the rainfall on the yield of paddy is positive and significant at various levels of significance which is welcome for the crop in different regions under study. The value of coefficient of determinant (R^2) was highest (0.7918) in South Andaman followed by Great Nicobar (0.6901), Little Andaman (0.6519) and North Andaman (0.5853), Table 1.

The results conclusively revealed that weather is the most important determinant of crop instability in Andaman and Nicobar islands. Though adequately and timely rainfall is admittedly an important factor for stable paddy production in Andaman and Nicobar islands but more

often compounded by lack of proper soil and water management techniques.

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