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An economic analysis of crop insurance and its feasibility in eastern Uttar Pradesh

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Abstract
Fluctuation of the yield of major crops in India is a common phenomenon due to natural hazards, like drought, flood, pest and disease. Hence the income of farmer's become instable perhaps crop insurance scheme is a suitable method to reduce such uncertainties. An attempt has been made to study the economic aspects of crop insurance scheme and its feasibility. The study is based on secondary data. The results reveal that there was a wide fluctuation in the yield of food grains in eastern Uttar Pradesh. The crop insurance was not found only feasible but it appeared self sustaining in the long run. Rainfall was also varied which is main reason for fluctuation of yield.

Keywords: Economic, crop insurance, feasibility, eastern

Introduction
The success and failure of the crop depends on natural condition i.e. favorable and unfavorable conditions. Sen (1967) [1] ±has reported that probability of drought in the state like Uttar Pradesh is once in three rears. About 32.4 per cent villages and 16.8 per cent area in the eastern U.P. is affected every year by flood, besides 57.84 per cent area is under rainfed. Singh (1961) suggested that diversification (Raising crop with milch animal) and crop insurance are mainly two methods for reducing uncertainty in farm income. Under crop insurance the crop loss suffered by few farmers get distributed amongst many farmers over many years in large area. Thus crop insurance is a technique of protecting farmers against elements of risk and uncertainty in crop production and also stabilizing farm income.
In present paper an attempt has been made;
1. To study the extent of yield fluctuations of major crops.
2. To examine the crop Insurance.
3. To study the extent of variability in annual rain falls in eastern U.P.

Research Methodology
Yield and rainfall data were collected from Directorate of Agriculture U.P. Lucknow and extent of variation was work out by following formula;

$$CV\% = \frac{\sigma}{\overline{X}}$$

Where
C V= Co-efficient of variability
σ = Standard Deviation
$\overline{X}$ = Estimated mean

To examine the possibilities of crop insurance in eastern U.P., the method followed by Singh (1972) [3] was used. It is assumed that whole average size of farm in eastern U.P. is under food grains production.

Result and Discussion
Table-1. Clearly indicates that rainfall in eastern U.P. is highly instable by indicating 68.30 per cent variability in annual rainfall over the period of 11 years, variability 86.76 per cent was recorded in Gorakhpur region while lowest rainfall variability 59.35 per cent was observed in Varanasi region. On an average Eastern U.P. received 204.62 annual rainfalls during reference period.

Table 1: Region wise annual rainfall variability over the period 1970-71 to 1981-82.

Parameters	Regions			
	Faizabad	Gorakhpur	Varanasi	Eastern U.P.
S.D.	50.94	50.67	36.25	139.76
Mean	80.53	63.01	61.09	204.64
C.V.%	63.26	86.76	59.35	68.30

Extent of Crop Yield Variability: The table 2 show yield variability in eastern U.P. for selected crops. Table-2 reveals that co-efficient of variation was highest for maize 39.11 per cent followed by Rice, Wheat, Bajra, Gram, Jawar. The lowest yield instability was recorded for Barley indicating there by less risky crop the region. On the basis of acreage wheat and Rice are the major Rabi and Kharif crops in the region involving greater amount of risk than other crops except Maize, suggesting scope for crop Insurance Scheme in the area.

Table 2: Crop yield variability in Eastern U.P. (1963-64 to 1982-83). (Unit Kg./hectare)

Crops	Average yield	Variance	Standard Deviation	Co-efficient of Variance(per cent)
Rice	763.15	62875.56	250.75	32.85
Jwar	751.95	43559.86	208.71	27.75
Bajra	854.35	65402.95	255.74	29.93
Maize	644.79	63604.84	252.20	39.11
Wheat	1160.79	123833.61	351.90	30.32
Barley	962.35	16009.84	126.53	13.15
Gram	706.90	38021.10	194.99	27.58

Feasibility of the crop insurance: An attempt has been made to estimate the average losses in the yield and to determine premium rates for such losses in respect of food grain crops on the average size of farm. The average size of farm in eastern U.P. is 0.76 hectare. Table-3 shows that if average farmer of Eastern U.P. growing food grains paid 37.38 Kg. per year as Crop Insurance premium, he would have paid only 747.60 Kg. at the end of twelve years period. In this situation the same farmer would have also received 747.60 Kg. as indemnity. Thus the total and average of indemnity received would be exactly equal to the total and average amount of insurance premium paid during twelve years. Thus it can be suggested that crop Insurance Scheme is not only feasible but it also appear self-sub staining in long run.

Table 3: Operation of a Crop Insurance Programme on an average size of farm (0.76 hetare holding) growing food grain crops in Eastern U.P.

Years	Food grain yield per hec.(Kg.)	Amount by which the yield in any given year falls below the average(Kg.)	Average premium paid per year (Kg.)	Size of farm 0.76 ha. Indemnity when yields falls below average (Kg.)
1963-64	763.43	59.49	37.38	45.21
1964-65	843.71	-	37.38	-
1965-66	719.75	103.17	37.38	78.40
1966-67	551.57	271.35	37.38	206.22
1967-68	862.86	-	37.38	-
1968-69	726.17	96.75	37.38	73.53
1969-70	851.71	-	37.38	-
1970-71	928.14	-	37.38	-
1971-72	606.43	216.49	37.38	164.53
1972-73	802.57	20.35	37.38	15.46
1973-74	850.43	-	37.38	-
1974-75	737.86	85.06	37.38	64.64
1975-76	917.71	-	37.38	-
1976-77	911.14	-	37.38	-
1977-78	1175.57	-	37.38	-
1978-79	890.86	-	37.38	-
1979-80	691.71	131.21	37.38	99.71
1980-81	881.86	-	37.38	-
1981-82	980.86	-	37.38	-
1982-83	980.43	-	37.38	-
Total	16458.40	983.87	747.60	747.60
Average	822.92	49.19	37.38	37.38

Conclusion

Fluctuations in rainfall are a chronic problem in the eastern U.P. during the period of 1971-72 to 1981-82. The degree of instability was highest in Gorakhpur and lowest in Varanasi region. There was a wide fluctuation in the food grain crops leading to a high degree of instability of the economy of the region. The crop insurance is feasible programme and appears to be self-sub staining in the crop run.

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