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Resource use efficiently of maize cultivation in Auriya District of U.P.

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Abstract
Maize belongs to family Poacea. Maize is the one of the miracle cereal crop of the world. It is the third most important food gain crop of India followed by Wheat and Rice. Maize is grown throughout the country on an area about 6 million hectare, contributing about 25 per cent of the total area of the continent. Maize grains contains about 10 percent protein. 4 percent oil, 70 percent Carbohydrate, 2.3 percent crud fibre, 10.4 percent albuminoids and 1.4 percent ashes.
This research study is based on 100 respondents of four size groups viz. Marginal, small, medium and large. The respondents were drawn out by multistage stratified proportionate random sampling method. The study period pertains to agricultural year 2014-15. Overall average size of holding was observed 1.42 hectare in the study area. Cabb-Douglas production function was applied for estimating the resource use efficiency. The study reveals diminishing return to scale. High value of R2 (Coefficient of multiple determination) ranging from 0.89 to 0.93 was observed from the functional analysis which indicates that 89 to 93 percent variation in yield is explained by included factors in function not analysis MVP (Marginal Value Productionty) of X_1, X_2 and X_3 were found more than unity except X_4 factor. This indicates that there is further scope of investment of these factors to obtain optimum utilization of those factors for harvesting optimum production.

Keywords: Resource, Maize Cultivation

1. Introduction
Diarrhoea Maize (Zea maize L.) belongs to family Poacea. Maize is the third most important food crop in India followed by wheat and rice. In India, about 28 percent of produced maize is used for food purpose, 48 percent for poultry feed, 12 percent for milling industries and 1 percent as seed. (AICRP-2007). Maize grain contains about 10 percent protein, 4 percent oil, 70 percent carbohydrate, 2-3 percent fiber, 10.40 percent albuminoids and 1.4 percent ashes.
Deriving by structural change in agricultural and food consumption pattern, maize seems to be an important cereal crop of future. Among the states of India, Andhra Pradesh ranks first in production followed by M.P., Kernatka, Rajasthan and U.P. In U.P. maize was cultivated on an area about 698000 hectares with production 11544.92 quintals having productivity 2.23 tonnes ha-^{1}. (Directorate of maize research, New Delhi, 2013-14).
Auriya district of U.P. enjoys sufficient acreage under maize cultivation with comparatively low productivity. There is sufficient scope of increasing productivity of maize in this district. Maize is one of the important lucrative crop for this area and proper cultivation of this crop can enhance the earnig capacity of the farmers. Keeping the above facts in due consideration the study entitle "Resource use efficiency of maize cultivation in Auraiya Distt. of U.P. Assumes special significance and importance, the study was carried out with objective, (i) to workout resource use efficiency of maize cultivation in the study area.

Materials and Methods
Multistage stratified purposive random sampling procedure was applied for selection of district, Block, village and respondents. Auriya district was purposively selected. "Sahar" block was enjoying highest acreage under maize cultivation also selected purposively. According to acreage under maize cultivation, five top ranking villages were selected from sahar block. Ultimately 100 respondents of different stratum viz. marginal, small, medium and large were drawn from selected villages following proportionate random sampling procedure. Cobb-Douglas production function was applied for estimating resource use efficiency of factors viz X_1, X_2, X_3 and X_4 standing for per hectare cost of seed, manure and fertilizer, irrigation charges and human labour, respectively.
Cobb-Dauglas Production function's formula

$y = a X_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4}.e^u$
Formula in log form –
$\log y = \log a + b_1 \log x_1 + b_2 \log x_2 + b_3 \log x_3 + b_4 \log x_4 + e^u$
Where y = output (Rs./ha)
b_1 to b_4 = production elasticities of X_1 to X_4

Results and Discussion
The production function analysis was carried out to determine the efficiency of various resources viz X_1, X_2, X_3 and X_4 representing per hectare seed cost, per ha manure and fertilizer cost, per ha irrigation charges and per ha value of human labour cost, respectively. The magnitude of estasticity of production, standard error, coefficient of multiple determination and return to scale of maize production on different size group of farms are presented in Table-1

Table 1: Resource use efficiency estimates of maize on different size of sample farms in the study area'

Size group of sample farms (ha)	Production elasticities				Sum of elasticities	R^2	MPV			
	X_1	X_2	X_3	X_4			X_1	X_2	X_3	X_4
Marginal (below 1 ha)	0.241278 (0.108904)	0.420225** (0.054924)	0.055934 (0.093504)	0.092614 (0.061063)	0.810051	0.899814	11.57717	4.61672	2.457636	0.295359
Small (1-<2ha)	0.239365* (0.102665)	0.471528** (0.073749)	0.12125 (0.305018)	0.02927 (0.029374)	0.861412	0.920058	11.41.683	4.973436	3.730103	0.115824
Medium (2-<3ha)	0.190591 (0.193232)	0.330757** (0.103738)	0.227477 (0.155431)	0.081184 (0.164582)	0.83001	0.922659	9.131072	3.336222	5.823279	0.307887
Large (3ha & Above)	0.189902 (0.120714)	0.458423** (0.07079)	0.088929 (0.513797)	0.092339 (0.255999)	0.829594	0.929153	8.485145	4.422698	2.147515	0.354641

(Figures in parentheses show standard error of respective variable)
**1% level of significance.
**5% level of significance

It is evident from this table that magnitude of sum of elasticities or returns to scale were found less than unity on various size group of farms. This indicates that production of Maize is characterised by diminishing return to scale in the study area. High value of R^2 (Coefficient of multiple determination) ranging from 0.89 to 0.93 revealed that included factors explains 89 to 93 per cent variation in yield of Maize cultivation in the study area.
This table also reflects MVP (Marginal Value Productivity) of included factors in the functional analysis of Maize cultivation. It is clear from the table that MVP of X_1, X_2 and X_3 factors were more than unity in case of all categories of farms indicating that there is further scope of investment on these factors to optimize their application and allocation for realising optimum return from these factors. MVP value of X_4 factor was observed less than unity revealed that excessive investment was done by the farmers on this factor in the study area. X_2 factor was found statistically significant on all categories of farms while X_1 factor was found statistically significant on marginal and small farms. Remaining factors were observed statistically non-significant in the study area.

Conclusions
This research study is based on 100 respondents of four size groups viz. Margins small, medium and large. The respondents were drawn out by multistage stratified proportionate random sampling method. The study period pertains to agricultural year 2014-15. Overall average size of holding was observed 1.42 hectare in the study area. Cabb-Douglas production function was applied for estimating the resource use efficiently. The study reveals diminishing return to scale. High value of R2 (Coefficient of multiple determination) ranging from 0.89 to 0.93 was observed from the functional analysis which indicates that 89 to 93 percent variation in yield is explained by included factors in function not analysis MVP (Marginal Value Productionty) of X_1, X_2 and X_3 were found more than units except X_4 factor. This indicates that there is further scope of investment of these factors to obtain optimum utilization of those factors for harvesting optimum productions.

References

1. Navadkar DS. Economics production and marketing of Maize in Ahmed Nagar district of Maharastra. Agriculture Situation in India 2012; 69(6):309-316.
2. Raj Kumar, Chahal SS. An Economic Analysis of Maize Marketing in Punjab. International Research Journal of Agricultural Economics and Statistics. 2011; 2(1):79-86.
3. Sanjay Kumar, Growerm DK. Maize (fodder) in Punjab: an economic analysis: Indian Journal of Agricultural research. 2014; 48(4):307-312.
4. Verma AR. Economics of Production, resource use efficiency, marketing and constraints of Maize in Tribal District Dhar of M.P. Agricultural Marketing. 2007; 46(4):108-116.