

## Effect of socio-economic characteristics on productivity of pearl millet

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### ABSTRACT

Pearlmillet (*Pennisetum typhoides* L.) is one of the most important cereal crops in India. The productivity is influenced by the production methods as well as the socio-economic characteristics of pearl millet grower. The data pertained to the year 2008-09 in order to study the effect of socio-economic characteristics of the grower on the productivity of pearl millet crop. Linear function was fitted to the data. Results revealed that, regression coefficients of family size (0.212), livestock (0.301) and capital investment on bullock pair (0.003) were positive and significant. Thus, it inferred that if one added person to family size, one added unit of livestock and one added rupee to investment on bullock pair could lead to increase the productivity of pearl millet by 0.212, 0.301 and 0.003 quintal, respectively.

### INTRODUCTION

India is the largest producer of pearl millet crop in the world. The total area under pearl millet cultivation in the country is 9.81 million hectares. The production of pearl millet is 9.24 million tonnes while its productivity is 942 kg per hectare. Productivity of pearl millet is affected due to production technology. In production, important inputs are like labour, fertilizers, manures and seed. Timely application of inputs can increase the productivity. But it is fact that, pearl millet productivity can also be affected due to experience of farmer, his educational standard and family workers. It is also influenced by economic condition of farmer in which land holding, livestock and capital investment on farm can be considered. Patil (2006) revealed that the socio-economic characteristics of pearl millet grower were like fifth standard of education family size of 5.63 persons and land holding with 2.34 hectares. Pearl millet is staple food of farm families in Beed district of Maharashtra. It is predominating cereal crop in cropping pattern with 16.20 per cent. Socio-economic factors are also rather considered than that of technical factors for increasing pearl millet productivity in the district. By managing such social as well as economic factors, pearl millet productivity can be increased which can help to increase the profitability of the crop. By keeping in view the above aspects, the present study has been

undertaken.

### METHODOLOGY

Multistage sampling design was adopted for selection of the district, tehsil, villages and farmers. At the first stage, Beed district was purposively selected for present study because of higher area under pearl millet. In the second stage, Georai tehsil was purposively selected from Beed district because of the highest area under *Kharif* pearl millet crop. In the third stage, eight villages from Georai tehsil were selected on the basis of highest area under rainfed pearl millet crop. At the fourth stage, the list of pearl millet growers was obtained from each of eight villages. From each village, twelve farmers were randomly selected. In this way ninety six pearl millet growers were selected for present study. The analytical technique was used to determine effect of socio-economic characteristics on productivity of pearl millet by application of linear functional form as follows.

$$Y = f(X_1, X_2, X_3, \dots, X_n)$$

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_nX_n$$

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8$$

where, Y=yield per hectare in quintals, a = Intercept of production function, bi= partial regression coefficients of the respective resource variable (i = 1, 2, 3, ... , 8), X<sub>1</sub> = Age in year, X<sub>2</sub> = Education level in five quantum scores, X<sub>3</sub>=Family size in persons, X<sub>4</sub> = Occupation level in three quantum scores, X<sub>5</sub>=

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Land holding in hectare,  $X_6$  = Milch animal in number,  $X_7$  = Capital investment on commonly used assets and farm building in Rs.,  $X_8$  = Capital investment on bullock pairs in Rs.

## RESULTS AND DISCUSSION

The findings obtained from the present study are presented below:

### *Socio-economic status of pearl millet grower:*

Socio-economic characteristics of pearl millet growers were calculated and are presented in Table 1. The results revealed that age of owner was higher on large farm (48.78 years) followed by 45.56 and 44.87 years on medium and small farms, respectively. In general, age of owner was found to be 46.40 years. In case of education level, it was observed that there was higher education as 2.21 scores on large farm than that of medium (2.00 scores) and on small farm (1.93 scores). On an average, education standard was found to be 2.04 scores. It implied that the education standard of pearl millet grower was found more than Primary education. In case of family size, there was higher family size with 6.71 persons on large farm while it was 5.40 and 5.31 persons on medium and small farms, respectively. It inferred the farm size decreased with decrease in family size. On an average, family size was 5.80 persons. The occupation level was found to be increased with an increase in the farm size. On an average occupation level was 1.28 score. It implied that, pearl millet grower was not depending on agriculture fully but he entered in other business. Holding size of the grower was 4.46 hectares on large farm followed by 3.11 hectares on medium farm and 2.44 hectares on small farm. In general, holding size of the grower was found to be 3.33 hectares. The result revealed that area under

pearlmillet was 1.31 hectares on large farm followed by 0.44 and 0.32 hectare on medium and small farms, respectively. In general, area under pearl millet was 0.69 hectare. It was obvious that capital investment on commonly used assets was higher as Rs.27,401.56 on large farm than that of Rs.19,561.50 on medium farm and Rs.13,465.62 on small farm. On an average, capital investment on commonly used assets was Rs.20,142.89. Capital investment on bullock pair increased with increase in farm size and it was Rs.38,249.90. It was observed that there was higher livestock as 1.87 standard units on large farm as compared to other farms. In general, the livestock was 1.23 standard units in the study area.

Similar results were observed by Patil (2006) with respect to age of farmer, education, holding size and so on. Shrivastav *et al.* (1996) studied income, saving and investment behaviour of farmers. They revealed that the sample farmers held, on an average, 4.14 hectares of land holding with an average family size of 8 members. The average income from all the activities for the small, medium and large farms were found to be to Rs.22617, Rs.50214 and Rs.87694, respectively.

### *Effect of socio-economic characteristics on productivity of pearl millet:*

Regression coefficients with respect to socio-economic characteristics regarding pearl millet were estimated and are presented in Table 2. Coefficients of multiple determination ( $R^2$ ) was 0.365 which indicated that 36.50 per cent variation in productivity of pearl millet was explained due to variation in all independent variables. F value was highly significant (6.263). In regard to regression coefficient of individual economic characteristics, regression coefficient with respect to capital investment on bullock pair was 0.003 which was

**Table 1 : Socio-economic characteristics of pearl millet grower**

Sr. No.	Particulars	Pearlmillet farm			Overall
		Small	Medium	Large	
1.	Age of owner (year)	44.87	45.56	48.78	46.40
2.	Education level in 5 quantum scores (illiterate/ Primary / High School/ Higher Secondary/ College level)	1.93	2.00	2.21	2.04
3.	Family size (Persons)	5.31	5.40	6.71	5.80
4.	Occupation level in 3 quantum scores (Agriculture/ Other business/ Service)	1.12	1.31	1.43	1.28
5.	Land holding (ha)	2.44	3.11	4.46	3.33
6.	Area under pearl millet (ha)	0.32	0.44	1.31	0.69
7.	Livestock in standard unit (No.)	0.88	0.96	1.87	1.23
8.	Capital investment on commonly used assets (Rs.)	13465.62	19561.50	27401.56	20142.89
9.	Capital investment on bullock pair (Rs.)	21843.75	35843.70	57062.50	38249.90

**Table 2 : Effect of socio-economic characteristics on productivity of pearl millet**

Sr. No.	Independent variable	Regression coefficient (bi)	Standard error	't' value
1.	Age (years)	-0.655	0.575	-1.139
2.	Education level in 5 quantum score (illiterate/ Primary/ High School/ Higher Secondary/College level)	-0.764	0.339	-2.254*
3.	Family size (persons)	0.212	0.090	2.355*
4.	Occupation level in 3 quantum scores (Agriculture / Other business/ Service)	-1.386	1.040	-1.333
5.	Land holding (ha.)	-2.932	1.247	-2.351*
6.	Livestock (No.)	0.301	0.142	2.121*
7.	Capital investment on commonly used assets (Rs.)	-0.005	0.002	2.500*
8.	Capital investment on bullock pair (Rs.)	0.003	0.001	3.000**
	Intercept a	16.421		
	R <sup>2</sup>	0.365		
	F-value	6.263**		
	n	96		
	Y	23.17		

\* and \*\* indicates significance of values of P=0.05 and 0.01, respectively

highly significant. It inferred that if Re.1 is increased in investment of bullock pair, it would lead to increase the productivity by 0.003q. In next order regression coefficient with respect to livestock was 0.301 which was significant. It implied that if one unit of livestock is increased on farm, it would lead to increase the productivity by 0.301 q. Similarly, regression coefficient with respect to family size was 0.212 which was also significant. When one person is increased in family size, it would lead to increase the productivity by 0.212 q. Regression coefficient with respect to land holding was -2.932 which indicated that when one hectare land holding is increased over existing land holding, it would lead to reduce the pearl millet productivity by 2.32 q. On the contrary regression coefficient with respect to education was -0.764 which was negatively significant. It inferred that, if education of owner increased by one score, it would lead to reduce the productivity by 0.764 q. Similarly, regression coefficient with respect to capital investment on commonly used assets was -0.005 which was also negatively significant. It implied that if Re 1 is increased on this investment, it would lead to reduce the productivity by 0.005 q. It could be concluded that, higher educated person and more capital investment on commonly used assets adversely affect the pearl millet productivity. Regression coefficients of age and occupation level were negative but non-significant. Therefore, in order to increase the productivity, family size, livestock and bullock pair might be given importance to increase the use of these variables in pearl millet production. Narayanmoorthy (2000) studied

farmers education and productivity of crops. He stated that, the coefficient of education implies that one per cent increase in the education level of the farmers will have an effect of 0.038 per cent in productivity of the crop.

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