

Socio-economic factors effect on gross income of orchard farm in Goa state

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ABSTRACT

Investigation was carried out during the year 2013-14. In all 48 orchard farms were randomly selected from sixteen villages of two tehsils in South-Goa district of Goa State. Data were related to cropping pattern and livestock pattern as well as socio-economic determinants. The results revealed that land holding showed highly significant on orchard farm with regression coefficient of 20182.43. It means that addition of one hectare could cause to increase gross income of ₹ 20182.43. Regression coefficient of livestock was 5841.99. It means that addition of one livestock could cause to increase gross income of ₹ 5841.99. On the contrary, family size showed regression coefficient of -1170.62 which was negatively significant. There could be reduction of gross income by ₹ 1170.62 if addition of one member in family. In next order, distance of farm from village showed negative regression coefficient of -2519.15, it could adversely affect gross income of ₹ 2519.15. Thus, the farmers have to give more importance to land holding, livestock, family size and distance of farm from village in order to increase gross income on orchard farm

Keywords: Orchard farm, regression coefficient, gross income, linear function

In Goa state, orchard farming consisted with more than 75 per cent area under orchard crops and remaining area under seasonal crops and annual crops, dairy as

well as other farm enterprises. The state has about 94351 hectares under orchard farm with 1397591 tonnes of production. A orchard farm dominated with crops like cashewnut, coconut, mango, arecanut, sapota, black pepper, banana, nutmeg and pineapple. The orchard farm also consisted with livestock like cow, buffalo, goat and poultry. These crops and livestock are the income sources of the orchard farmers (Chikale *et al.* 1996 and Nagargoje, 2000).

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The gross income of the farm is directly depending on the technology of each of the crops. The income is also affecting due to metrological factors as well as infrastructural factors. The income can also affect due to socio-economic determinants of the farmers. The important determinants are like age of the farmer, education, family size, occupation, land holding, fragmentation of land, distance of farm from village, social category, bullock pair and livestock on the farm. In order to find out effective determinants, the present study has been undertaken.

DATABASE AND METHODOLOGY

Coefficients of variation (CV) used to measure the comparative variations of socio-economic characteristics. In order to know the dispersion, the standard deviation and coefficient of variation were estimated with the following formula. Standard deviation measures the dispersion between the observations and the dispersion is expressed in the form of coefficient of variation.

$$SD = \sqrt{\frac{\sum(Y - \bar{Y})^2}{(n - 1)}}$$

$$CV = \frac{SD}{Mean} \times 100$$

Linear multiple regression analysis

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

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

The equation fitted was as follows.

$$\hat{Y} = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10}$$

Where,

- \hat{Y} = Estimated gross income (Rs/ farm)
- a = Intercept of production function, bi = partial regression coefficients of the respective resource variable (i = 1, 2, 3....10), X_1 = Age of farmer in year, X_2 = Educational level in score, X_3 = Family size in member, X_4 = Occupational level in score, X_5 = Land holding in hectare, X_6 =

Fragmentation of land in number, X_7 = Distance of farm from village in kilometer, X_8 = Social category score, X_9 = Bullock pair in number, X_{10} = Livestock in standard animal unit.

Table 1: Cropping pattern and livestock pattern on orchard farm

S. No.	Particular	Orchard farm	
		Area (ha) and livestock (no)/farm	Per cent
	Crop		
1.	Khariif paddy	0.26	6.81
2.	Rabi paddy	0.14	3.66
3.	Rabi cowpea	0.02	0.52
4.	Rabi brinjal	0.02	0.52
5.	Sugarcane	0.12	3.14
6.	Banana	0.14	3.66
7.	Pineapple	0.11	2.89
8.	Seasonal crops (Σ 1 to 7)	0.81	21.20
9.	Cashewnut	0.86	22.51
10.	Coconut	0.71	18.59
11.	Mango	0.60	15.71
12.	Arecanut	0.30	7.86
13.	Sapota	0.23	6.02
14.	Black pepper	0.18	4.71
15.	Nutmeg	0.13	3.40
16.	Orchard crops (Σ 9 to 15)	3.01	78.80
17.	Gross cropped area (Σ 8 and 16)	3.82	100.00
18.	Net sown area	3.64	95.29
29.	Double cropped area	0.18	4.71
30.	Cropping intensity	-	104.95
	Livestock (standard animal unit)		
1.	Cow	1.06	43.62
2.	Buffalo	1.10	45.27
3.	Goat	0.26	10.70
4.	Poultry	0.01	0.41
5.	Total (Σ 1 to 4)	2.43	100.00

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Table 2: Mean, SD and CV of socio-economic characteristics of orchard farmer

Sl. No.	Particular	Orchard farm		
		Mean	SD	CV %
1.	Age of farmer (year)	49.98	±11.41	22.83
2.	Educational level (3 quantum score)	2.15	±0.85	39.53
3.	Family size (no)	5.83	±2.13	36.54
4.	Occupational level (3 quantum score)	1.65	±0.84	50.91
5.	Land holding (ha)	3.75	±2.54	67.73
6.	Fragmentation of land (no)	1.29	±0.50	38.98
7.	Farm distance from village (km)	2.50	±1.65	66.00
8.	Social category (3 quantum score)	2.49	±0.49	19.67
9.	Bullock pair (no)	0.71	±0.61	85.92
10.	Livestock (standard animal unit)	2.43	±1.69	69.55

RESULTS AND DISCUSSION

Cropping pattern and livestock pattern on orchard farm were estimated and are presented in Table 1. The results revealed that gross cropped area was 3.82 hectares on orchard farm. Proportionate area under cashewnut was 22.51 per cent followed by coconut (18.59 per cent) and mango (15.71 per cent). Thus cashewnut, coconut and mango were found to be major crops on orchard farm. Cropping intensity was 104.95 per cent because orchard farm consisting with more number of annual crops. In regard to livestock, it was observed that livestock was 2.43 in standard animal units on orchard farm (Tawale, 2011.).

Socio-economic characteristics of orchard farmer were calculated and are presented in Table 2. Results revealed that age of orchard farmer was more than 49.98 years. Educational level on orchard farm was 2.15 scores. Family size was 5.83 members while occupational level showed 1.65 scores on orchard farm. Land holding was 3.75 hectares with coefficient of variation of 67.73 per cent (Ramachandra, 2006.). Fragmentation of land

was 1.29 numbers on orchard farm with coefficient of variation of 38.98 per cent. Distance of farm from village was 2.50 kilometers. Social category showed 2.23 scores on orchard farm. Bullock pair was 0.71 in number and livestock was 2.43 standard animal units respectively, on orchard farm (Narayanmoorthy, 2000).

Table 3: Effect of socio-economic determinants on gross income of orchard farm

S. No.	Particular	Regression coefficient (b _j)	Standard error (SE)	t-value
1.	Age (years)	-118.22	59.69	-1.981
2.	Educational level (3 quantum score)	-561.37	526.11	-1.067
3.	Family size (no)	-1170.62	339.50	-3.448**
4.	Occupational level (3 quantum score)	522.72	90.90	5.750
5.	Land holding (ha)	20182.43	6740.95	2.994**
6.	Fragmentation of land (no)	-1715.96	382.08	-4.491
7.	Distance of farm from village (km)	-2519.15	1002.04	-2.514*
8.	Social category (3 quantum score)	793.03	643.28	1.233
9.	Bullock pair (no)	-3886.06	4346.82	-0.894
10.	Livestock (standard animal unit)	5841.99	2131.33	2.741**

Intercept 61052.50

F- value.....3.98**

R²0.58

n48

Note: Gross income (Y) was ₹ 873426.02/farm

*Significant at 5 per cent, **Significant at 1 per cent

Effect of socio-economic determinants on gross income of orchard farm was estimated through application of linear function and is presented in Table 3. Coefficient of multiple determination was 0.58 which indicated 58.00 per cent effect of all determinants on gross income. Regression coefficient of land holding was 20182.43 which were highly significant. It implied that when there was increase in land holding by one

hectare on orchard farm there could be possibility to increase gross income of ₹ 20182.43. Livestock showed positive regression coefficient with highly significance. It indicated that addition of one livestock to its mean could cause to increase the gross income of Rs 5841.99 on orchard farm. On the contrary, family size showed regression coefficient of - 1170.62 which was negative but highly significant at 1 per cent level (Pawar *et al.* 2002). Distance of farm from village showed negative regression coefficient of -2519.15 which was significant at 5 per cent level. Social category was indicating positive regression coefficient but not significant. Similarly, occupational level also indicated positive but non significant regression coefficient. On the contrary, age, education, fragmentation of land and bullock pair were showing negative regression coefficient which were not significant.

CONCLUSION

Cashewnut, coconut and mango were major crops while cow and buffalo were major milch animals on orchard farm. Land holding and livestock can positively affect gross income on orchard farm. On the contrary, family size and distance of farm from village can affect gross income negatively. Hence land holding, livestock, family size and distance of farm from village are important socio-economic determinants to increase gross income of orchard farm.

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