Research Article
FACTOR SHARE ANALYSIS OF GARLIC (*ALLIUM SATIVUM*) IN SOUTHERN RAJASTHAN

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Abstract: The research study is carried out to analyze the share of inputs among different factor of garlic production in Southern Rajasthan. Pratapgarh and Chittorgarh districts were selected on the basis of highest area under garlic cultivation in Rajasthan. The present study is based on primary data. The data was collected from the growers of garlic by personal interview method using pre-tested and suitably structured schedule. The results of this study revealed that seed contribution is highest among all factor of garlic production in Pratapgarh and Chittorgarh districts. Seed accounted 31.78 per cent of total garlic production in Pratapgarh district which was higher at medium farm as compared to small farm (31. 71 per cent) and large farm (31.49 per cent). Whereas, the contribution of seed is 28.70 per cent, 28.20 per cent and 27.37 per cent of total garlic production on small, medium and large farm in Chittorgarh district. It was higher at small farm than medium and large farm. The irrigation was the second key factor among all factors of garlic production in Pratapgarh and Chittorgarh districts. Irrigation shared 7.31per cent at small farm, 6.91 per cent at medium farm and 6.80 per cent of total production at large farm in Pratapgarh district. While, it accounted 6.73 per cent of total production in medium farm and followed by small farm and large farm i.e., 6.72 per cent and 6.25 per cent in Chittorgarh district. Total human labour and machine labour also important factor in garlic production which contributed 6.19 per cent and 3.73 per cent of total production in Pratapgarh district and 6.20 per cent and 3.54 per cent of total production in Chittorgarh district. Total human labour and machine labour were higher in small farm as compared to medium farm and large farm. Interest of fixed capital (0.21 per cent) and plant protection management (0.84 per cent) accounted lowest share among all factor of garlic production in Pratapgarh district. Whereas, there were 0.22 per cent and 0.76 per cent of total production in Chittorgarh district. These were higher in small farm as compared to medium farm and large farm. Apart from the above factors, manure, rental value of land, depreciation, fertilizer and interest on working capital are also having contribution in garlic production in Pratapgarh and Chittorgarh districts.

Keywords: *Garlic production, Factor share analysis, Contribution, Factors of garlic production, Seed and irrigation*

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Introduction

Horticulture is an important sector which provide direction for diversification, increase income and return per unit area, better land and water used and opportunities for employment generation. Spices is important group of horticultural crops in India. India is known as home of spices as Indian spices are world famous for their flavor and fine texture. Garlic is one of the important horticultural crop and occupies important position in spice category. Garlic is medicinal and widely consumed bulbous spice crops of Amaryllidaceae (Alliaceae). The production of garlic record as increase the farmer's economy along with agricultural development and it also play important role in Indian economy due to commercial crop. The improved practices of garlic cultivation strategy determines for use of balanced and efficient use of modern inputs for profitable and enhance production. Garlic is one of the major spices in spices group in term of area and production in India. The major spices producing state of India are Andhra Pradesh, Kerala, Gujarat, Rajasthan, Maharashtra, West Bengal, Karnataka, Tamil Nadu, Orissa and Madhya Pradesh etc. India is the second largest producer of garlic in the world (FAOSTAT-2020). In India, total area under Garlic cultivation was 385324 hectare in 2021-22 which led to production of 3164.63 thousand Tonnes. Whereas Rajasthan had an area of 90,926 hectares with production of 539.18 thousand Tonnes under garlic cultivation during 2021-22. (National Horticulture Board, 2021-22). Garlic is valued for its flavor and has commercial importance because of its wide medicinal value and application in food and pharmaceutical preparations [1]. The spices production plays a vital role for increasing the economic development of farmer's specially marginal and small farmers and for obtaining the nutritional requirement of the people.

The study of spices profitability in production and post- harvest management practices is important to improve the production process and marketing system to development and provide efficiency services in transfer to farm product and input from producer to consumers and minimizes cost and increase the benefit for all category of farmers [2-4].

Material and Methods

The physical quantity of each factor input multiplied by its price and then divided by the value of the total product, gives factor share input [5-9].

$\Pi(X_1) = P_1X_1 / Py$, $\Pi(X_2) = P_2X_2 / Py$, $\Pi(X_3) = P_3X_3 / Py$, $\Pi(X_4) = P_4X_4 / Py$, $\Pi(X_5) = P_5X_5 / Py$, $\Pi(X_6) = P_6X_6 / Py$, $\Pi(X_7) = P_7X_7 / Py$, $\Pi(X_8) = P_8X_8 / Py$, $\Pi(X_9) = P_9X_9 / Py$

Where,

$\Pi(X_1)$ = Share of seed

$\Pi(X_2)$ = Share of hired labour

$\Pi(X_3)$ = Share of imputed value of family labour

$\Pi(X_4)$ = Share of total human labour

$\Pi(X_5)$ = Share of manure

$\Pi(X_6)$ = Share of depreciation

$\Pi(X_7)$ = Share of interest on working capital

$\Pi(X_8)$ = Share of rent paid for lease in land

$\Pi(X_9)$ = Share of interest on owned fixed asset

P_1 = Cost of seed

P_2 = Cost of hired labour

Factor Share Analysis of Garlic (*Allium sativum*) in Southern Rajasthan

Table-1 Factor share analysis of garlic production in Pratapgarh district

Factors of production	Small			Medium			Large		
	Value of garlic (Rs./ha)	Average production of garlic (qtls)	Factor share (per cent)	Value of garlic (Rs./ha)	Average production of garlic (qtls)	Factor share (per cent)	Value of garlic (Rs./ha)	Average production of garlic (qtls)	Factor share (per cent)
Output	210853	52.71	100	204932	51.23	100	204427	51.11	100
Seed	66852.7	16.71	31.71	65128.8	16.28	31.78	64383.4	16.09	31.49
Manure	7364.34	1.84	3.49	4237.44	1.05	2.06	2885.37	0.72	1.41
Hired labour	387.59	0.09	0.18	485.16	0.12	0.24	602.77	0.15	0.29
Family labour	12662.3	3.16	6.01	11242.9	2.81	5.49	9837.57	2.45	4.81
Total human labour	13049.9	3.26	6.19	11728	2.93	5.72	10440.3	2.61	5.11
Depreciation	4253.51	1.06	2.01	5423.85	1.35	2.64	6549.13	1.63	3.2
Interest on Working capital	3604.18	0.9	1.71	3306.24	0.83	1.61	3177.86	0.79	1.55
Interest on fixed capital	458.99	0.11	0.21	549.76	0.13	0.27	620.51	0.15	0.303
Rent paid to leased in land	0	0	0	0	0	0	0	0	0
Rental value of land	4926.47	1.23	2.34	5571.43	1.39	2.71	5861.11	1.47	2.87
Fertilizer	3329.3	0.83	1.57	1819.22	0.45	0.89	1283.16	0.32	0.63
PPM	1767.44	0.44	0.84	1789.95	0.45	0.87	1833.99	0.45	0.89
Irrigation	15410.9	3.85	7.31	14172.4	3.54	6.91	13910.1	3.47	6.8
Total machine labour	7864.34	1.97	3.73	6831.05	1.71	3.33	5897.23	1.47	2.88

Table-2 Factor share analysis of garlic production in Chittorgarh district

Factors of production	Small			Medium			Large		
	Value of garlic (Rs./ha)	Average production of garlic (qtls)	Factor Share (Per cent)	Value of garlic (Rs./ha)	Average production of garlic (qtls)	Factor Share (Per cent)	Value of garlic (Rs./ha)	Average production of garlic (qtls)	Factor Share (Per cent)
Output	226228	53.23	100	225208	52.99	100	220448	51.87	100
Seed	64919.4	15.28	28.7	63517.2	14.94	28.2	61279.7	14.42	27.37
Manure	7612.9	1.79	3.37	5681.53	1.33	2.52	3915.25	0.92	1.75
Hired labour	317.54	0.07	0.14	690.68	0.16	0.31	867.32	0.2	0.39
Family labour	13728.7	3.23	6.06	12045.2	2.83	5.35	11612.2	2.73	5.19
Total human labour	14046.2	3.31	6.2	12735.9	2.99	5.66	12479.5	2.93	5.58
Depreciation	4752.36	1.12	2.1	6973.67	1.64	3.09	7537.27	1.77	3.37
Interest on working capital	3541.37	0.83	1.57	3393.74	0.79	1.51	3180.64	0.75	1.42
Interest on fixed capital	504.59	0.12	0.22	637.15	0.14	0.28	684.006	0.16	0.31
Rent paid to lease in land	0	0	0	0	0	0	0	0	0
Rental value of land	5339.39	1.26	2.36	5769.23	1.36	2.56	6142.85	1.45	2.74
Fertilizer	3376.45	0.79	1.49	2267.39	0.53	1.01	1512.37	0.36	0.68
PPM	1729.83	0.41	0.76	1792.99	0.42	0.79	1894.06	0.45	0.85
Irrigation	15209.7	3.57	6.72	15148.1	3.56	6.73	13995.8	3.29	6.25
Total machine Labour	8016.13	1.89	3.54	7866.24	1.85	3.49	7411.01	1.74	3.31

P_3 = Cost of imputed value of family labour

P_4 = Cost of total human labour

P_5 = Cost of manure

P_6 = Cost of depreciation

P_7 = Cost of interest on working capital

P_8 = Cost of rent paid for lease in land

P_9 = Cost of interest on owned fixed asset

P_y = Price of the output

Results and Discussion

Factor share analysis of garlic production

Garlic is one of the major spices in spices groups in order to production and area in southern Rajasthan. The yield of garlic crop depends on many factors of garlic production. It varies from area to area in study region. It was always found better scale to measure fertility and economic feasibility of crop in particular farm and region. Factor share analysis was calculated to estimate the share of inputs among different factor of garlic production in Pratapgarh and Chittorgarh districts. It was calculated by physical quantity of each factor input multiplied by its price and divided by the value of total output.

Analysis of factor share in garlic production in Pratapgarh district

Factor share analysis of garlic production in Pratapgarh district was presented in [Table-1]. At small farms- It is observed from [Table-1] that seed contribution is highest among all factor of garlic production for small farms. It is 31.71 per cent shared of total garlic production. The productivity of garlic depend on seed quality and also increased by quality of seed. It was influenced by price fluctuation and variability in quality of seed used by garlic producers on all farm size of groups. The irrigation was the second key factor among all factors of garlic production which accounting in the yield and uniqueness of garlic crop. It shared 7.31 per cent of total production.

Total human labour and machine labour also important factor in garlic production which contributed 6.19 per cent and 3.73 per cent of total production. It was observed that large share of human labour accounted in garlic production which lead the human drudgery and lower efficiency of labour. Interest of fixed capital accounted lowest share (0.21 per cent) among all factor of garlic production.

It was observed that plant protection management also contributed lowest share (0.84 per cent) followed by fertilizer (1.57 per cent), interest on working capital (1.71 per cent) on small farms. Apart from the above factors, manure (3.49 per cent), rental value of land (2.34 per cent) and depreciation (2.01 per cent) are also having contribution in garlic production.

At medium farm- Seed contributed highest share between all factors of garlic production. It shared 31.78 per cent of total production on medium farms. The irrigation shared highest in garlic production after seed among all factors of garlic production. Out of total production, 6.91 per cent of total production accounted by irrigation followed by total human labour and machine labour *i.e.*, 5.72 per cent and 3.33 per cent of total production. Interest of fixed capital accounted lowest share (0.27 per cent) among all factor of garlic production followed by plant protection management (0.87 per cent), fertilizer (0.89 per cent), interest on working capital (1.61 per cent) on medium farms. Apart from the above factors, manure (2.06 per cent), rental value of land (2.71 per cent) and depreciation (2.64 per cent) are also having contribution in garlic production.

At large farm- Among all factor of garlic production, Seed accounted highest share *i.e.*, 31.49 per cent of total production at large farms. The irrigation shared 6.80 per cent of total production followed by total human labour and machine labour *i.e.*, 5.11 per cent and 2.88 per cent of total production. Interest of fixed capital accounted lowest share (0.31 per cent) among all factor of garlic production followed by plant protection management (0.89 per cent), fertilizer (0.63 per cent), interest on working capital (1.55 per cent) on medium farms. Apart from the above factors, manure (1.41 per cent), rental value of land (2.87 per cent) and depreciation (3.20 per cent) are also having contribution in garlic production. The result of study shows that to enhance factor share to increase the garlic production. For garlic production, seed, irrigation and human labour accounted higher share between the different factors of garlic production. It can concluded that increase research and development expenditures in the study area which helps to decline cost of garlic production [10,11].

Analysis of factor share in garlic production in Chittorgarh district

Factor share analysis of garlic production in Chittorgarh district was presented in [Table- 2]. At small farms- It shows that seed was key component among all factor of production of garlic crop. It accounted 28.70 per cent of total garlic production.

The irrigation obtained second position after seed among all factors of garlic production which shared 6.72 per cent of total garlic production. Total human labour and machine labour are also having contribution in garlic production. These factor contributed 6.20 per cent and 3.54 per cent of total garlic production. Interest of fixed capital shared lowest share (0.22 per cent) among all factor of garlic production. It was observed that share of plant protection management is 0.76 per cent followed by fertilizer (1.49 per cent), interest on working capital (1.57 per cent) on small farms. While, manure, rental value of land and depreciation accounted 3.37 per cent, 2.36 per cent and 2.10 per cent of total garlic production. At medium farm- Seed contributed highest share between all factors of garlic production. It shared 28.20 per cent of total production on medium farms. The irrigation contribution is 6.73 per cent in total garlic production which was higher after seed among all factors of garlic production. It was observed that 5.66 per cent of total garlic production accounted by total human labour followed by machine labour *i.e.*, 3.49 per cent for medium farms. The share of interest of fixed capital is 0.28 per cent of total garlic production which was lowest among all factor of garlic production followed by plant protection management, fertilizer and interest on working capital *i.e.*, 0.79 per cent, 1.01 per cent and 1.51 per cent on medium farms. Although, manure accounted 2.52 per cent, rental value of land 2.56 per cent and depreciation 3.09 per cent in garlic production.

At large farm- Seed accounted highest share (27.37 per cent) between all factors of garlic production at large farms. The irrigation shared 6.25 per cent of total production which was higher than total human labour (5.58 per cent) and machine labour (3.31 per cent) Interest of fixed capital accounted lowest share (0.31 per cent) among all factor of garlic production. The share of plant protection management is 0.85 per cent of total garlic production as compared to fertilizer (0.68 per cent), interest on working capital (1.42 per cent) is on medium farms. Apart from the above factors, manure (1.75 per cent), rental value of land (2.74 per cent) and depreciation (3.37 per cent) are also having contribution in garlic production. The result of study revealed that seed, irrigation and human labour were key factor for garlic production among the different factor of garlic production. The factor share analysis provide a way forward in pre-harvest management for research and development.

Conclusion

Garlic is one of the major spices in spices groups in order to production and area in southern   Rajasthan. The yield of garlic crop depends on many factors of garlic production. The highest share of seed is 31.78 per cent of total garlic production in Pratapgarh district which was higher at medium farm as compared to small farm (31. 71 per cent) and large farm (31.49 per cent). Whereas, seed accounted is 28.70 per cent, 28.20 per cent and 27.37 per cent of total garlic production on small, medium and large farm in Chittorgarh district. It was higher in Pratapgarh district than Chittorgarh district. The irrigation is obtained second position among all factors of garlic production in Pratapgarh and Chittorgarh districts. Irrigation shared 7.31per cent at small farm, 6.91 per cent at medium farm and 6.80 per cent of total production at large farm in Pratapgarh district. While, it accounted 6.73 per cent of total production in medium farm and followed by small farm and large farm *i.e.*, 6.72 per cent and 6.25 per cent in Chittorgarh district. Total human labour and machine labour also important factor in garlic production which contributed 6.19 per cent and 3.73 per cent of total production in Pratapgarh district and 6.20 per cent and 3.54 per cent of total production at small farm in Chittorgarh district. Interest of fixed capital and plant protection management (0.84 per cent) accounted lowest share among all factor of garlic production in Pratapgarh and Chittorgarh district. Apart from the above factors, manure, rental value of land, depreciation, fertilizer and interest on working capital are also having contribution in garlic production in Pratapgarh and Chittorgarh districts.

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Application of research: Factor share analysis provide a way forward in pre-harvest management for research and development in study area. Thus, it was found that the cultivation of garlic was more profitable in Chittorgarh district than Pratapgarh district

Research Category: Agricultural Economics and Management

Abbreviations: FAOSTAT-Food and Agriculture Organization of the United Nations, Statistics Divisions, NHB-National Horticulture Board

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