

# Enhancing Farmers' Income through Vegetable Farming in Raichur District of Karnataka: An Economic Analysis

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## ABSTRACT

Vegetable cultivation is an awesome business in India. Vegetable cultivation offers a unique opportunity for marginal and small farmers of Karnataka due to its remuneration. Consequently, vegetable cultivation in Karnataka, even in offseason, has picked up on quite a large scale. The present study analyzed the cost and returns structure of selected vegetables in Raichur district of Karnataka by involving 30 vegetable growers. The results revealed that the production of vegetables has shown a high growth rate of 2.64 percent per annum. The cost of cultivation of tomato was the highest (₹ 105390/ac) as compared to okra and brinjal (₹ 29450/ac and ₹ 41839/ac). The gross returns obtained from the tomato crop were the highest as compared to other vegetables. The return per rupee invested in vegetable production was highest in case of okra (1.31) followed by brinjal crop (1.30) and tomato (1.23). The okra crop is more economical than tomato and brinjal which create pathway for continues profitability as well as sustainability of agriculture.

**Keywords:** Cost of cultivation, Production, Returns, Vegetables

India is primarily a vegetarian country and the second largest producer of vegetables, next to China. The cultivation of vegetables is most suitable in India, with its preponderance of small land holdings, varied climatic conditions and surplus family labour. However, the level of profitability of vegetable crops depends upon the ways and manner in which the farmers market their produce, in addition to the technology adopted by them in growing the crop. The time of sale, prices at which they sell and agency through whom they sell are some of the factors that influence the net income received by the farmers for surplus vegetables (Agarwal and Saini, 1995).

The potentiality and contribution of vegetables to the national economy have been well recognised in recent years. Some studies revealed that the per-

hectare income obtained from vegetables is almost four times greater than that obtained from field crops. However, profitability of vegetable crops depends upon how best the producer converts his crop into cash which in turn depends upon his skill and knowledge in marketing (Marothia *et al.* 1996).

Vegetable marketing is different from the marketing of other agricultural commodities because of their high perishability, concentration of trade in a few hands and large number of producers (Sharma *et al.* 1995). Marketing of vegetable crops is quite

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complex and risky due to the perishable nature of the produce, seasonal production and bulkiness (Ajay *et al.* 2019). The spectrum of prices from producer to consumer, which is an outcome of demand and supply in transactions between various intermediaries at different levels in the marketing system, is also unique for vegetables. Moreover, the marketing arrangements at different stages also play an important role in determining price levels at various stages, viz., from the farm gate to the ultimate user. However, vegetable cultivation in India is still an unorganised sector, with farmers following traditional practices. Besides, the vegetable growers are not as well served by the agriculture extension system as the farmers growing food grains and due to this, productivity and production efficiency remain low (Priyanka and Ansari, 2020). Vegetable cultivation is an awesome business that will enhance the income of the farmers. Thus, the present study aims to know the scenario of vegetable cultivation and the profitability of selected vegetable cultivation in Raichur district, Karnataka state, with the following objectives:

1. To study the present scenario of vegetable crops in Karnataka.
2. To assess the cost and returns of selected vegetable cultivation.

## METHODOLOGY

The study was carried out purposively in Raichur district of Kalyana Karnataka region where the vegetables production is on the rise. A total of 30 vegetable growers were selected for the study using the snowball random sampling technique. To fulfil the objective of the study, primary data were collected through the personal interview method using pre-tested schedules during 2021-22.

The collected data were tabulated and analysed by employing descriptive statistics methods. The cost and returns of vegetable cultivation were analysed using modern cost concepts. In most of the vegetable crops, the output included the main yield of the crop. The gross returns are worked out by multiplying the total output by the prevailing price in the market. The net return is obtained by deducting the total cost from the gross return. A return per rupee of investment, or Benefit Cost Ratio is calculated by

dividing the value of gross returns by the total cost of cultivation.

## RESULTS AND DISCUSSION

### Indian scenario of vegetable cultivation

The exponential growth model was employed to find out the growth in area, production and productivity of vegetables in India, and the results are presented in Table 1. The production of vegetables has shown a high growth rate of 2.64 percent per annum; this may be due to an increase in the area under vegetable cultivation, which has shown positive growth of 1.99 percent per annum. The growth in productivity has shown a meagre growth of 0.65 per cent which call for the attention of developing high yielding varieties by the scientists. Similarly, the coefficient of variation was observed to be higher in vegetable production than in the area or productivity of vegetables.

**Table 1:** Growth in area, production and productivity of vegetables in India

Year	Area ( ' 000 Hectares)	Production ( ' 000 MT)	Productivity (MT/Hectare)
2011-2012	8990	156326	17.0
2012-2013	9205	162187	18.0
2013-2014	9396	162897	17.0
2014-2015	9542	169478	18.0
2015-2016	10106	169064	17.0
2016-2017	10238	178172	17.0
2017-2018	10259	184394	18.0
2018-2019	10073	183170	18.0
2019-2020	10240	188132	18.4
2020-2021	10859	200445	18.5
2021-2022	11280	204613	18.1
CGAR (%)	1.99	2.64	0.65
CV (%)	6.91	8.85	3.39

Source: *indiastat.com*.

### State-wise area, production and productivity of vegetables in India

Among Indian states, West Bengal has the highest area under vegetables (13.66%), followed by Uttar Pradesh (11.97 %), Maharashtra (10.67 %), Madhya Pradesh (9.32 %), Bihar (8.17%) and others (20.67%). Karnataka stands 8th position in both area and

production. The production was found highest in Uttar Pradesh and West Bengal with a share of 14.80 and 14.12 percent of total production. Whereas, the productivity was found highest in Madhya Pradesh, Gujarat and Bihar states (Table 2 & Fig. 1).

### Karnataka Scenario of vegetable cultivation

Karnataka stands at the 8<sup>th</sup> position in area and production of vegetables in India, contributing 4.53 percent (500.93 thousand hectares) in area and 4.05 percent (8099.77 metric tonnes) in total vegetable

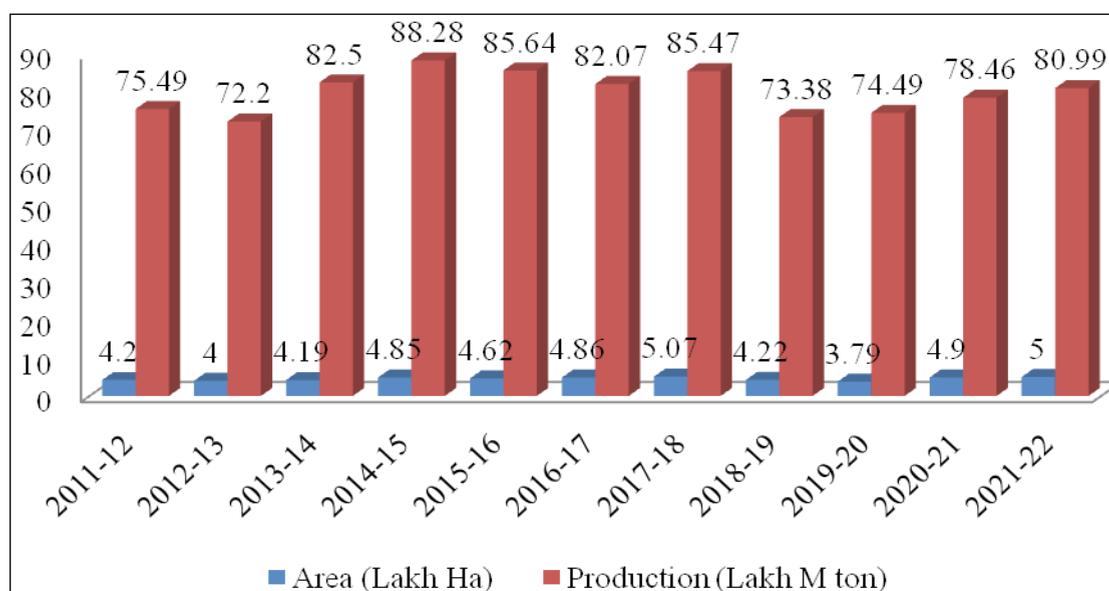
production during 2021-22. The area and production trends of vegetables found that, over the years, an uneven growth of vegetables with little variation in vegetable area and production in Karnataka has been observed. From 2012-13 to till 2014-15 there was a gradual increase in production of vegetables noticed, but later years (2018-19) the decreased trend were observed, than again from 2019-20 onwards the area and production trends been increased (Fig. 1).

Among various districts in Karnataka, Bagalkot district ranks first with an area of 37549.09 ha,

**Table 2:** State-wise area, production and productivity of vegetables in India during 2021-2022

States	Area (in ' 000 Hectare)	% of total	Production (in ' 000 Metric Tonne)	% of total	Productivity (in MT/Hectare)
West Bengal	1511.19	13.66	28229.16	14.12	18.68
Uttar Pradesh	1324.91	11.97	29584.06	14.80	22.33
Maharashtra	1180.43	10.67	16783.40	8.40	14.22
Madhya Pradesh	1031.06	9.32	20591.22	10.30	19.97
Bihar	903.47	8.17	17767.84	8.89	19.67
Gujarat	785.80	7.10	15687.11	7.85	19.96
Odisha	674.97	6.10	9523.71	4.76	14.11
Karnataka	500.93	4.53	8099.77	4.05	16.17
Chhattisgarh	490.06	4.43	6887.65	3.45	14.05
Haryana	372.37	3.37	6295.61	3.15	16.91
Others	2289.87	20.69	40432.96	20.23	17.72
India	11065.06	100.00	199882.49	100.00	18.06

Source: indiastat.com.



**Fig. 1:** Area and production trends of vegetables in Karnataka

followed by Kolara (35668 ha) and Chitradurga (35072 ha). Whereas, Raichur district stands at the 15<sup>th</sup> position in area of total vegetables in Karnataka (Table 3).

**Table 3:** District wise area and production of vegetables in Karnataka during 2019-20

Sl. No.	Districts	Area (Ha)	% of total
1	Bagalkot	37549.09	8.32
2	Kolara	35668.00	7.91
3	Chitradurga	35072.00	7.77
4	Gadag	34155.00	7.57
5	Chikkaballapura	32664.00	7.24
6	Dharawad	27988.16	6.20
7	Vijayapura	26882.00	5.96
8	Belagavi	21347.00	4.73
9	Haveri	21207.00	4.70
10	Koppala	19975.00	4.43
11	Kalaburgi	13659.00	3.03
12	Raichur	9114.00	2.02
13	Others	135859.50	30.11
Total		451139.72	100.00

Source: Karnataka at a Glance: 2020-21.

## Demographic characteristics of the sample respondents

The demographic characteristics of vegetable growers are presented in Table 4. The data reveals that the majority of the respondents were aged between 35 and 50 years, constituting 50 percent of the total; 9 respondents were aged above 50 years, constituting 30 percent of the total; and the remaining 5 respondents were aged below 35 years, constituting 20 percent of the total number of respondents, respectively. Middle-aged (between 35 - 50 years) farmers are more enthusiastic and have more knowledge and experience regarding vegetable cultivation. Generally these age group farmers have more physical vigor, active in adoption of improved agricultural practices and also have more responsibility towards family than younger ones. Thus, most of the vegetable growers were from the middle age group, which could be justified. The average age of the sample respondent was around 44 years.

With regard to education, it is evident that a larger number (40.00%) of farmers had studied up to primary school, followed by high school (30.00%), PUC (10.00%), and a degree (3.33%). The rest were neo-illiterates (10.00%) and illiterates (6.67%). Non-realization of the influence of formal education in one's life, illiteracy of the parents might have come in the way of providing better education by their parents. Another contributing reason could be that the rural social environment might not have encouraged their parents to give their children an education. As the rural people are still traditional based they generally do not prefer to sent their children to college and they expect their children to assist in farm and household activities. The distance of higher education centres from villages and financial constraints might also have prevented the parents from providing higher education to their children.

A perusal of Table 4 also indicated that the majority (46.67%) of the vegetable growers had medium farming experience, followed by high (33.33%) and low (20.00%) farming experience. Farming experience mainly depends on the age and education of the farmers. The majority of respondents belonged to the middle-aged and old-age categories, and they might have started farming in their early years themselves. So the majority of respondents had medium farming experience. Since agriculture is the main occupation of the majority and there is a need to support family members.

Around seventy percent (63.33%) of the respondents belonged to the nuclear family type, and 36.67 percent had a joint family. The present situation of continuous fragmentation of family for self growth might have favoured results. With respect to size of land holding, fifty percent of vegetable growers belonged to the marginal farmer category, followed by small farmers (33.33%) and medium farmers (16.67%). Around 80 per cent of the sample farmers in the study area belonged to marginal and small land holdings this could be due to fragmentation of ancestral land from generation to generation because of increased population day by day might have land to smaller size of land holding.

Over one third of vegetable growers practise a subsidiary occupation along with agriculture as the source of income. Now a day because of the costliest

life the farmers are not only dependent on agriculture as main source but also they rely on non farming activities as multiple source of income. The more-or-less similar findings were reported by Suman (2019).

**Table 4:** Demographic characteristics of the sample respondents (n=30)

Sl. No.	Particulars	Number	Per cent
<b>1</b>	<b>Age</b>		
	Young (> 35 years)	6	20.00
	Middle (35-50 Years)	15	50.00
	Old (> 50 Years)	9	30.00
	Average	44.43	
<b>2</b>	<b>Education</b>		
	Illiterate	2	6.67
	Neo literate	3	10.00
	Primary (1-7 <sup>th</sup> std)	12	40.00
	High school (8-10 <sup>th</sup> std)	9	30.00
	PUC	3	10.00
	Graduate	1	3.33
<b>3</b>	<b>Farming experience</b>		
	Low (up to 10 years)	6	20.00
	Medium (10-20 years)	14	46.67
	High (more than 20 years)	10	33.33
<b>4</b>	<b>Family type</b>		
	Nuclear	19	63.33
	Joint	11	36.67
	Average Family size	5.13	
<b>5</b>	<b>Size of land holding</b>		
	Marginal (upto 2.5 acres)	15	50.00
	Small (2.51-5.0 acres)	10	33.33
	Medium (5.01-25 acres)	05	16.67
<b>6</b>	<b>Occupation</b>		
	Agriculture	30	100.00
	Subsidiary/Non-Agriculture	12	40.00

### Cropping pattern of the sample respondents

The sample farmers cultivated a number of crops on their farm. Tomatoes, okra, and brinjal were the major vegetables, while redgram, cotton, and paddy were the major field crops. Vegetables were found to be grown all around the year by sample farmers in Raichur district, and the details are presented in Table 5. The major finding reveals that the major

vegetables grown in the study area were tomato, okra, brinjal, cauliflower, cucumber, drumstick, green chilli, and onion. It was noticed that nearly one fourth (23.04%) of sample farmers cultivate tomato, followed by okra (18.57%), brinjal (15.47%) and cauliflower (14.22%), as these sample farmers are nearer to the district place (Raichur) and there is a demand for fresh vegetables in the market, which ensures better market prices for their produce. Apart from vegetable cultivation, the sample farmers also cultivate other food and non-food crops like redgram (26.39%), cotton (22.01%), jowar (15.26%) and chickpea (14.77%) to augment their income and meet their daily food requirements. Similar findings were reported by Jagrati *et al.* (2020).

**Table 5:** Cropping pattern of the sample respondents

Sl. No.	Vegetable crops	Per cent	Other Crop	Per cent
1	Tomato	23.04	Redgram	26.39
2	Okra	18.57	Cotton	22.01
3	Brinjal	15.47	Paddy	21.57
4	Cauliflower	14.22	Jowar	15.26
5	Cucumber	10.01	Chickpea	14.77
6	Drumstick	9.63		
7	Green chilli	5.22		
8	Onion	3.84		

### Cost and return of selected vegetables

The cost and returns of tomato, okra and brinjal cultivation are presented in Table 6. Among the three major vegetable crops, the cost of cultivation (C3) incurred in the case of tomato was the highest at ₹ 105390 per acre as compared to okra and brinjal (₹ 29450 and ₹ 41839, respectively). The average yield of tomato (137 qt/ac) is higher than brinjal and okra because tomato has a higher yield and productive potential than brinjal and okra. In case of market price, okra (₹ 1279/qt) is having greater market value than tomato (₹ 957/qt) and brinjal (₹ 843/qt), it is due to okra is having more demand at domestic market.

The gross return obtained from the tomato crop was the highest (₹ 130287/acre) as compared to brinjal (₹ 54795/acre) and okra (₹ 38370/acre). The net returns was seen highest again in case of tomato (₹ 24897/acre) as compared to brinjal (₹ 12956/acre) and okra (₹ 8920/acre), respectively. The

returns per rupee invested in vegetable production were highest in the case of okra (1.31), followed by brinjal (1.30) and tomato (1.23). The results indicated that the okra crop earned higher returns compared to other vegetables. The returns per rupee of invested indicated that the cultivation of vegetables in the district is economically feasible and offered increasing scope for expansion of area under vegetables in the district at the aggregate level. It can also be observed that tomato cultivation is less viable than okra and brinjal cultivation. The higher difference in net returns may be due to variations in the price of vegetables and costs incurred on various farm operations. Similar studies were reported by Raghupathi and Kumar (2018), Agarwal and Banerjee (2019) and Harisha *et al.* (2019).

**Table 6:** Cost and return of Tomato, Okra and Brinjal cultivation in the study area (₹/ac)

Sl. No.	Particulars	Tomato	Okra	Brinjal
1	Cost of cultivation	105390	29450	41839
2	Cost of production (₹/q)	770	982	644
3	Yield (q/ac)	137	30	65
4	Price (₹/q)	951	1279	843
5	Gross return	130287	38370	54795
6	Net return	24897	8920	12956
7	Returns per rupee of investment	1.23	1.31	1.30

## Marketing Channels

The agricultural commodities reach the final consumer through various channels depending on the season and price movement in the market. In the study area over 90 per cent of the farmers sold their produce through only one channel for all the vegetable crops *i.e.*, Producer → Commission agent → wholesaler → retailer → consumer.

In this channel, the producer after harvesting of the main product sells it to commission agents. The commission agent transports to the nearby market and sells his commodity to wholesaler and the wholesaler again sells his commodity to retailers. The retailer directly sells to the consumer. The more or less similar findings were reported by Venkataramana, *et al.* (2015).

## CONCLUSION

Vegetables are not notified commodities in the regulated market in the study area. The price fluctuation was very wide during the study period for the selected vegetables, which ranged from Rs 951 to ₹ 1400 in tomato, ₹ 1279 to ₹ 1590 in Okra and ₹ 843 to ₹ 1501 in brinjal. Even though the results indicated that the vegetable production would enhance the farmer's income. During steep drops in price, farmers are forced to discard their produce in market yards or in fields, which can be addressed by effective mechanisms of processing vegetables or value added products. Alternative methods such as Price Deficit Payment Scheme, cooperatives and farmer producer organization and crop planning could be explored, with benefits that can reach a large number of farmers.

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