

# Cost and return structure of marigold production- An economic Approach

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**Abstract:** The study was conducted to assess the cost and returns of marigold in Belagavi district. The primary data were collected from 60 marigold growers spread over Athani and Chikkodi taluks of Belagavi district of Karnataka. It was found that each and every respondent family depends on agriculture for their livelihood and employment. The study revealed that the cost of cultivation per acre was Rs. 41664.24. The average yield per acre was 9.04 tonnes which accrued a gross return of Rs. 81736.67 per acre and net return per acre was Rs. 40072.43.

**Keywords:** cost of cultivation, yield per acre, gross returns.

## I. INTRODUCTION

Agriculture, being the most dignified and oldest profession in the mankind, still engages over 1.3 billion people throughout the world or 40 per cent of global work force. Agriculture provides livelihood to half of the population in about 50 countries and even 75 percent in poorer nations (International Fund for Agricultural Development, 2011). Floriculture has become a supreme commercial activity in agriculture sector in the post globalization era. Floriculture activity has marked as a viable and profitable trade area with a potential to activate self-employment among low- and middle-income farmers and earn the very essential foreign exchange in the developing countries such as India. Today, the floriculture has earned the status of an industry and it has emerged as the major venture in the world trade. Many growers are engaged in high-tech horticulture with the purpose of entering export market and to capitalize floriculture trade. Different kinds of flower plants and ornamental plants are cultivated for national and international trade in both developed and developing countries. Today, horticulture is broadly known as a profitable profession with much more returns per unit area.

Government of India has considered floriculture industry as a fast-growing industry and fully export oriented business in this decade. Due to continuous increase in demand for flower, floriculture trade is now one of the most significant commercial trades in horticulture and in agriculture too. The Indian floriculture market is worth about Rs. 157 Billion in 2018. The market is further estimated to reach Rs. 472 Billion by 2024, increasing at a compound annual growth rate of 20.10 per cent. The major cities and the metros currently represent major consumers of flowers in the country. As a result of increasing urbanization and influence of western cultures, "saying it with flowers" is becoming quite popular on a number of occasions such as Valentine's Day, birthdays, festivals, anniversaries, marriages, farewell parties, religious ceremonies, etc. The consumption of flowers is expected to increase further as trends of urbanization.

## II. REVIEW OF LITERATURE

Sai *et al.* (2018) carried out a survey in Surajpur district of Chhattisgarh, to study the cost and returns of Marigold cultivation. He reported that cost of cultivation showed an increasing trend from marginal to small farms for marigold crop. The overall cost of cultivation for marigold worked out as Rs. 84594 per ha. and it ranges from marginal farms Rs. 82344 per ha. to Rs. 85588 per ha. at small farms. The overall input-output ratio and B:C Ratio was 1:2.18 and 1:1.19 for marigold crop. Overall, family labour income was Rs. 105317 per ha. Family labour income and farm business income was higher at small farms Rs. 105317 per ha. and Rs. 113377 per ha, respectively. Overall, farm investment income was found to be Rs. 108618 per ha.

Tripathi and Zechariah(2018) in their study on marigold in Raipur district of Chhattisgarh with a sample of 90 respondents reported that, the total cost of cultivation of marigold for small, medium and large size farms were Rs. 56,237/ha, Rs. 57,454/ha and Rs. 58,746/ha, respectively. The gross returns obtained per hectare by large size farms were high Rs. 2,34,000/ha as compared to small and medium size farms Rs. 2,25,000/ha and Rs. 2,30,100/ha, respectively. And the net returns per hectare were highest in large size farms Rs. 1,75,254/ha as compared to the small and medium size farms Rs. 1,68,763/ha and Rs. 1,71,354/ha, respectively. Input-output ratio per hectare was same in large and medium size farms (1:4.00), whereas in small size farms it was 1:3.98.

Kumar *et al.* (2013) conducted study on production and marketing of Marigold flowers in Uttar Pradesh with special reference to Kanauji district. Study made an attempt to analyse the cost and returns of marigold flowers. The overall cost for the cultivation of marigold was worked out to Rs. 73,650 per hectare. The total gross returns and average net returns from marigold production was calculated to be Rs. 1,21,792 and Rs. 48,141 per hectare, respectively. The return per rupee of investment was analysed to be at Rs. 1.66, which shows that, the production of marigold was highly profitable in the study area.

## III. METHODOLOGY

Among the ten taluks in Belagavi district Athani and Chikkodi taluk stands first and second in area and production of marigold flower cultivation, hence these taluks were purposively selected for the study. For the study, necessary primary data related to the production of marigold flower crop were collected from the sampled marigold growers through personal interview method.

Pre-tested schedule was used. The data collected from the respondents include some general information about the marigold flower cultivators, area under marigold, cost of cultivation, input use etc. The information on other aspects such as land use, fixed assets, cropping pattern, maintenance cost, irrigation, yield and returns of the crop was also collected using pre-tested schedule.

#### Analytical Technique

A simple percentage analysis was employed to identify the socio-economic characteristics and cost and returns.

**Depreciation charges:** Depreciation on each of the capital equipment and machinery owned by the respondent farmers was calculated, based on the purchase value using the straight-line method. Thus, the

Annual depreciation = Purchase Value - Junk value / Useful life of the asset

**Land revenue:** Land revenue was charged at the rates levied by the government.

**Rental value of land:** It is taken based on yearly basis and based on the type of crop sown. **Total cost (TC):** Total cost is the sum of total variable cost (TVC) and total fixed cost (TFC).

**Gross returns (GR):** Per acre gross returns were calculated by using the following formula.

Gross Returns (GR) = yield × price

**Net returns over variable costs:** It is the gross returns minus variable costs.

Sl. No.	Particulars	Number	Percentage of total
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Net returns over variable costs = GR – TVC

**Net returns over cost of cultivation:** It is the gross returns minus variable costs plus fixed costs. Net returns over cost of cultivation = GR - (TVC + TFC)

**Returns per rupee of investment:** Worked out by taking the ratio of gross return divided by total cost. Returns per rupee of investment = Gross returns / Total cost

**B:CRatio:** The benefit-cost ratio formula is the discounted value of the project's benefits divided by the discounted value of the project's costs:

BCR = Discounted value of benefits / discounted value of costs.

#### IV. RESULT AND DISCUSSION

The results of the study are presented in this chapter under the following headings in accordance with the objective of the study. The main focus here is to throw lime light on some of the factors responsible for major findings. Keeping the objectives of the study in view the results are discussed under the following headings:

1. To examine the socio-economic profile of marigold growers.
2. To estimate the cost and returns structure of marigold.

##### Socio-economic profile of marigold growing farmers

The study comprised of 60 marigold growing farmers spread over Athani and Chikkodi taluks of Belagavi district of Karnataka. From Table 1, it could be seen that a large number (46.67%) of the respondents were middle aged (35-50 years) followed by old age (>50 years) (31.67%) and young aged who were less than 35 years (21.66%) of age. The results show that majority were middle aged group of farmers have combined with experience and enthusiastic towards farming to try unconventional methods. The classification of sample households in the study area depends on family size. The table clearly shows that a majority (71.66%) of respondents were under the category of medium size (4-6 members) family, followed by the small (<4 members) (18.33%) and large size (>6 members) family (10.00%), respectively (Table 1). The results revealed that majority of respondents are from four to six, approximately each family group have at least two male and female involved in farming, so it helps to reduce the cost of hired labour and removes uncertainty with timely supply of labour force. Results pertaining to education indicated that 25.00 per cent of the respondents were studied up to High school followed by Middle school (23.33%), illiterate (15.00%), School (11.67%), PUC (10.00%), (10.00%) of the respondents are Graduated, (1.67%) have done post-graduation while, just (3.33%) of the respondents had education up to diploma (Table 1).

The level of education is important to access the new technology and market information regarding the crop cultivation. The study revealed that most of the sample farmers are literate (85.00%) having their formal education ranging from primary to above graduation. The study shows that respondents with agriculture as the primary occupation (100.00%) (Table 1). It concludes that each and every respondent family depends on agriculture for their livelihood and employment.

**Table 1: Socio-economic profile of marigold growing farmers**

A.	Age		
1.	Young (<35 years)	13	21.66
2.	Middle (35 – 50 years)	28	46.67
3.	Old (>50 years)	19	31.67
	<b>Total</b>	<b>60</b>	<b>100.00</b>
B.	Family size		
1.	Small (< 4 members)	11	18.34
2.	Medium (4 – 6 members)	43	71.66
3.	Old (> 6 members)	6	10.00
	<b>Total</b>	<b>60</b>	<b>100.00</b>
C.	Educational status		
1.	Illiterate	9	15.00
2.	Primary	7	11.67
3.	Secondary	14	23.33
4.	SSLC	15	25.00
5.	PUC	6	10.00
6.	Diploma	2	3.33
7.	Graduation	6	10.00
8.	Post-Graduation	1	1.67
	<b>Total</b>	<b>60</b>	<b>100.00</b>
D.	Occupation		
1.	Agriculture as the main occupation	60	100.00
2.	Agriculture as subsidiary occupation	0	0.00
	<b>Total</b>	<b>60</b>	<b>100.00</b>

(n=60)

**Landholding and source of irrigation**

Table 2 presents the landholding and source of irrigation of marigold cultivators. The table clearly reveals that, the average size of landholding was 2.74 acres. Among that, the average rainfed area was 0.08 acres and the average irrigated area was 2.66 acre. 36.67 per cent of the marigold growers relied on pump set for irrigation and 28.33 per cent of the producers depending on canal and borewell, 18.34 per cent have canal supplies and 8.33 per cent have borewell and 8.33 per cent rainfed irrigation purpose. The farm holdings consisted of fragmented holdings with a mixture of enterprise such as crop, dairy, goat *etc.* The clearly indicates that most of the respondents are small farmers.

**Table 2: Landholding size and sources of irrigation**

(n = 60)			
Sl. No.	Particulars	Average area	Percentage of total
1.	Landholding	Rainfed	0.08
		Irrigated	2.66
		<b>Total</b>	<b>2.74</b>
		<b>Number</b>	<b>Percentage</b>
2.	Source of irrigation	Bore well	05
		Canal	11
		Pumpset	22
		Rainfed	05
		Canal + Borewell	17
		<b>Total</b>	<b>60</b>
			<b>100.00</b>

**Table 3: farm assets**

(n=60)			
Sl. No.	Particulars	Number of respondents	Percentage of total
1.	Tractor/Power tiller	10	16.66
2.	Bullock cart	10	16.66
3.	Pump set	22	36.66
4.	Hand sprayers/power sprayers	32	53.32
5.	Sickles	60	100.00

6.	Spade	60	100.00
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### Farm assets

The status of farm assets of marigold growers is presented in Table 3. The table demonstrates that 16.66 per cent of cultivators had tractors and bullock carts, followed by pump-set (36.66%), hand sprayers, power sprayers (53.32%), sickles (100.00%), spade (100.00%), respectively. The investment in non-land fixed assets reveals that majority of the respondents owned bore well, irrigation pump-set and sprayer. It concludes that ground water is exploited, as most of crop grown by the farmers are irrigated.

### Livestock

The detail of livestock with the respondents is presented in Table 4. The table indicated that, out of 60 respondents 24 households maintained (106) poultry, followed by 78 cows in 50 households, 65 buffaloes in 49 household, 61 sheep in 43 households, 33 goats in 24 households and 9 bullock pair in 9 household. Belagavi is one of the dry districts in the state of Karnataka. Hence, most of the farmers are dependent on livestock as a source of sustainable income. The number of livestock maintained by respondents is partly depended on the quantity of fodder required and family labour availability. The (Table 4) revealed that, 83.41 per cent farmers maintained milch animals and few with sheep, goat, buffalo and bullock pair.

**Table 4: Details of livestock among respondents**

(n=60)			
Sl. No.	Particulars	Number of households	Number*
1.	Bullock (pair)	9	9
2.	Cow	50	78
3.	Buffaloes	49	65
4.	Sheep	43	61
5.	Goat	24	33
6.	Poultry	24	106

\* Multiple responses

The average quantity of different inputs used and their values per acre of sample respondents are presented in Table 5. It was observed that the cost of cultivation of marigold per acre was Rs. 41640.18 out of this, 70.76 per cent was variable cost. The major variable cost was of human labour *i.e.*, 13668.63 Rs. 5292.70 (19.30%) followed by fertiliser cost, (Rs. 3862.07) farm yard manure, seedling cost (Rs. 2498.40), interest on working capital (Rs. 2055.74), machine labour (Rs. 1394.39), fertilizer (Rs. 6845.69), bullock labour (Rs. 3591.53), marketing cost (Rs. 24.05) and plant protection chemicals (Rs. 693.66), respectively.

**Table 5: Cost of cultivation of marigold**

(Rs. / acre); (n=60)			
Sl. No.	Costs	Value	Percentage of total
<b>1.</b>	<b>Variable cost</b>		
A	FYM (Rs.)	3862.07	13.10
B	Seedling (Rs.)	2498.40	8.47
C	Fertilizer (Rs.)	5292.7	17.95
D	PPC (Rs.)	693.66	2.35
E	Human Labour (Rs.)	13668.60	46.35
G	Machine labour	1394.39	4.73
H	Marketing Cost	24.06	0.08
J	Total working capital	27409.85	
K	Interest on working capital @7.5%	2055.74	6.97
	<b>Total variable cost</b>	<b>29489.24</b>	<b>100</b>
<b>2.</b>	<b>Fixed Cost</b>		
A	Depreciation	580.35	4.70
B	Land revenue	38.00	0.30
C	Rental value of land	10500.00	86.33
D	Total FC	11,118.35	
E	Interest on fixed capital @9.5%	1056.24	8.67
	<b>Total fixed cost</b>	<b>12174.59</b>	<b>100</b>
<b>3.</b>	<b>Total cost of cultivation</b>	<b>41664.24</b>	

Hence the results clearly indicate that the share of variable cost to the total cost was high. This may be attributed to use of more labour by the respondent growers. Pushpa (2007) in her study on cost and returns structure for the production marigold in Guntur represented that marigold was labour intensive crop and incurred significantly high cost on human labour. The other major components of variable cost are the seedling cost and farm yard manure. This was because only a smaller number of nurseries were involved in production of seedlings/ planting materials of marigold and also it was due to the long distance from point of production to the point of market as marigold is a perennial crop.

The average fixed cost per acre was Rs. 11118.35 which accounted for 91.32 per cent of total cost of cultivation. The major items of fixed cost incurred by the farmers were, rental value of land accounting for Rs. 10500.00 per acre which formed (86.33%) it is due to the value of land in use. The depreciation charges of pump sets and other implements accounted for Rs. 580.35 (4.70%) and land revenue Rs. 38 per acre (0.30%), managerial cost was taken at 9.50 per cent of the working capital *i.e.*, Rs. 1056.24 per acre (8.67%) based on the interest charged by the banks in the study area. The study clearly reveals that the total fixed cost of marigold was very marginal.

#### Yield and returns

The average yield, gross and net returns per acre of marigold among the sample farmers are represented in Table 6. The table indicated that the average yield of marigold was 9.04 tonne per acre. The average price realized by farmer respondents was Rs. 10,000 per tonne of marigold flowers. The gross returns on marigold production were Rs. 81736.67. Total cost (which include TVC+TFC) was Rs.41664.24per acre. Hence, the net returns were Rs. 40072.43, due to high yield and better management practices adopted by the marigold growers. The analysis of cost and returns indicates that the net return per rupee of expenditure in marigold production was Rs. 1.96. As the ratio is above unity, the cost of cultivation could be considered as a profitable venture.

**Table 6: Yield and returns from marigold cultivation**

Sl. No.	Particulars	Values
1.	Yield (ton)	9.04
2.	Price (Rs. /ton)	9040
3.	Gross return (Rs. /acre)	81736.67
4.	Total cost (Rs.)	41664.24
5.	Net return (Rs.)	40072.43
6.	Benefit cost ratio	1.96

(n=60)

#### V. CONCLUSION

Floriculture is an essential agribusiness gaining commercial importance in the vital scenario of Indian agriculture. Traditional flowers have been the central component in the country. But, the cultivation of flowers under greenhouse technique with international quality standard is actually a recent development. The Indian floriculture market was worth Rs. 157 Billion in 2018. The market is further estimated to reach Rs. 472 Billion by 2024, increasing at a CGAR of 20.1 per cent during 2019-2024. Marigold is a very important traditional flower crop of south India. In India, it is cultivated commercially in southern states of Karnataka, Madhya Pradesh and Gujurath. As it is produced commercially, the area and production of marigold is gaining importance in the country and more so in Karnataka state. Marigold stands 1<sup>st</sup> position with regard to the area of 10290 hectare and 1<sup>st</sup> position with regard to the production it is 87.34 metric tonnes. Many high-tech floriculture plants have been introduced in the country in the recent years. Similarly, number of farmers coming forward to cultivate the flower crop has also increased. The study of socio-economic characters will help to know the factors that have contributed notably for changes in the economic performance, and employment opportunities of the producers and how these factors can be used to plan on the investment for the cultivation of marigold. The average yield procured by the sample farmers in the actual study area was around 9.04 tons per acre with a gross return of Rs. 81736.67 per acre and net return of Rs. 40072.43 per acre. As indicated in the results, the cultivation of marigold was noticed to be profitable (B: C ratio is 1.96). Hence, the farm universities and Government needs to conduct research on how to reduce the cost of production especially in the harvesting of flowers.

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