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Economic analysis of marigold production in Kolhapur district of Maharashtra

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ABSTRACT

The present study entitled “Economics of Production and Marketing of Marigold in Kolhapur District of Maharashtra” was undertaken to estimate the cost and returns of marigold cultivation and to assess its profitability under different farm-size groups. The study was based on primary data collected from 90 marigold growers selected from six villages of Hatkanangale and Shirol tehsils of Kolhapur district during the agricultural year 2024–25. The selected growers were classified into small, medium and large farm-size groups based on the area under marigold cultivation. The data were analysed using standard cost concepts and tabular analysis.

The study revealed that the average marigold yield was 168.08 q/ha. The overall Cost ‘A’, Cost ‘B’ and Cost ‘C’ were ₹1,63,476.01, ₹2,65,702.56 and ₹2,86,388.33 per hectare, respectively. The average gross return from marigold cultivation was ₹5,88,291.84 per hectare, while the net return over Cost ‘C’ was ₹3,01,903.51 per hectare. The Benefit-Cost ratio was 2.05, indicating that marigold cultivation was economically viable and profitable. Among the different components of cost, seedlings constituted the major share of total cost, followed by hired female labour, plant protection chemicals, micronutrients and machine power. The results indicated that, despite relatively high production costs, the returns obtained from marigold cultivation were sufficiently high to provide substantial net income to growers.

The study concluded that marigold cultivation has considerable potential as a profitable commercial flower enterprise in Kolhapur district. Efficient management of major cost components, particularly expenditure on planting material and labour, along with timely adoption of improved production practices, can further improve profitability and enhance the income of marigold growers.

Keywords: Marigold, Cost of cultivation, Cost and returns, Gross return, Net return, Benefit-Cost ratio, Profitability

Introduction

Floriculture has emerged as an important and rapidly growing component of horticulture, contributing to agricultural diversification, employment generation and farm income. Flowers are widely used for religious ceremonies, festivals, marriages, decoration and other social functions, resulting in increasing demand for commercial flower crops. Among the various flower crops cultivated in India, marigold (*Tagetes* spp.) occupies an important position because of its wide adaptability, ease of cultivation, relatively short crop duration and continuous market demand.

Marigold is predominantly cultivated as a loose flower crop and has considerable economic importance in India. Its attractive colour, multiple uses and regular demand make it a preferred commercial flower crop among farmers. The flowers are extensively used for garland making, religious offerings, decoration and various social functions. The crop also has industrial importance due to the presence of carotenoid pigments such as lutein. These characteristics have contributed to the increasing adoption of marigold cultivation in different parts of the country.

Maharashtra is one of the important flower-producing states in India, where marigold is cultivated under diverse agro-climatic conditions. The crop has gained importance among farmers because of its potential to generate comparatively quick and remunerative returns. Kolhapur district has favourable conditions for commercial marigold cultivation, including suitable agro-climatic conditions, availability of irrigation facilities and proximity to important consumption and marketing centres. Hatkanangale and Shirol talukas have emerged as important areas of marigold cultivation in the district.

The profitability of marigold cultivation largely depends on the efficient utilization of production resources and the relationship between the cost of cultivation and returns obtained. Increasing expenditure on seedlings, labour, fertilizers, plant protection, irrigation and other inputs can significantly influence the total cost of production. Similarly, variations in yield and farm-level flower prices directly affect gross returns and

profitability. Therefore, systematic estimation of the cost structure and returns is essential for evaluating the economic viability of marigold production.

Despite the increasing importance of marigold as a commercial flower crop, location-specific information on its production economics is essential for identifying major cost components and assessing the profitability of cultivation. Such information can assist farmers in making rational production decisions and help extension agencies and policymakers in formulating appropriate strategies for improving farm income.

Hence, the present study entitled “Economic Analysis of Marigold Production in Kolhapur District of Maharashtra” was undertaken to estimate the cost of cultivation, returns and profitability of marigold production in the study area.

2. Methodology

2.1 Selection of the study area

The present study was conducted in Kolhapur district of Maharashtra, which was purposively selected due to the increasing importance of commercial marigold cultivation in the district. Among the different

tahsils, Hatkanangale and Shirol were purposively selected based on the concentration of marigold cultivation, availability of irrigation facilities and accessibility to markets.

From each selected tahsil, three villages having relatively higher area under marigold cultivation were selected purposively. Thus, six villages, namely Rukadi, Male and Herale from Hatkanangale tahsil and Danoli, Kothali and Kavthesar from Shirol tahsil, were selected for the study.

2.2 Sampling design

A multistage sampling procedure was adopted for the selection of respondents. In the first stage, Kolhapur district was selected purposively, followed by the purposive selection of Hatkanangale and Shirol tahsils. In the third stage, three villages from each selected tahsil were selected purposively. Finally, 15 marigold growers from each village were selected by simple random sampling, resulting in a total sample of 90 marigold growers.

For analytical purposes, the selected growers were classified into three farm-size groups based on the area under marigold cultivation:

Table 1. Distribution of Sample Marigold farmers by Farm Size Group:

Tahsil	Village	Small Scale Farmer	Medium Scale Farmer	Large Scale Farmer	Total
Hatkanangale	Rukadi	5	5	5	15
	Male	5	5	5	15
	Herale	5	5	5	15
Shirol	Danoli	5	5	5	15
	Kothali	5	5	5	15
	Kavthesar	5	5	5	15
	Total	30	30	30	90

The data collected from the sample farmers were analysed to estimate the cost of cultivation and production of marigold. The standard cost concepts, namely Cost A, Cost B and Cost C, were used along with simple statistical measures such as averages and percentages.

Cost A: Includes expenses on human labour and machinery labour, seedlings, manures and fertilizers, plant protection, irrigation, depreciation, land revenue, interest on working capital, and other incidental charges.

Cost B: Includes Cost A plus the imputed rental value of owned land and interest on fixed capital.

Cost C: Includes Cost B plus the imputed value of family labour and represents the total cost of cultivation.

Results and discussion

Table 2. Cost of Cultivation Marigold . (₹/ha)

Sr. No.	Items of Cost	Small			Medium			Large			Overall		
		Qty	Value (₹)	%	Qty	Value (₹)	%	Qty	Value (₹)	%	Qty	Value (₹)	%
1.	Hired Human Labour (Days)												
a)	Male	8.04	3216.67	1.14	8.061	3224.25	1.13	8.11	3242.59	1.11	8.07	3227.83	1.13
b)	Female	93.16	23289.35	8.26	94.10	23524.90	8.25	95.30	23824.17	8.16	94.18	23546.14	8.22
2.	Bullock Power (Pair-days)	0.33	700.00	0.25	0.55	647.28	0.23	0.71	1005.51	0.34	0.53	784.26	0.27
3.	Machine Power (Hours)	32.56	16369.01	5.81	34.04	17019.36	5.97	35.91	17953.01	6.15	34.17	17113.79	5.98
4.	Seedlings (No.)	19371.39	32931.36	11.69	19402.93	32984.98	11.56	19486.06	33126.31	11.34	19420.13	33014.22	11.53
5.	Manures (Qtls.)	17.64	7057.41	2.50	17.72	7086.50	2.48	18.13	7252.43	2.48	17.83	7132.11	2.49
6.	Fertilizers (Kg)												
	Nitrogen	89.77	1153.56	0.41	91.88	1180.63	0.41	92.10	1183.50	0.41	91.25	1172.56	0.41
	Phosphorus	86.07	5052.26	1.79	86.21	5060.63	1.77	87.75	5151.21	1.76	86.68	5088.04	1.78
	Potassium	75.50	4280.75	1.52	75.64	4289.01	1.50	76.82	4355.88	1.49	75.99	4308.55	1.50
7.	Weedicide (₹)		250.41	0.09		249.52	0.09		250.19	0.09		250.04	0.09

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Sr. No.	Items of Cost	Small		Medium		Large		Overall	
8.	Micronutrients (₹)	19575.09	6.95	19776.20	6.93	19824.54	6.79	19725.28	6.89
9.	Irrigation Charges (₹)	8270.30	2.93	8294.59	2.91	8308.32	2.84	8291.07	2.90
10.	Plant Protection Charges (₹)	20962.96	7.44	20178.03	7.07	20945.04	7.17	20695.34	7.23

Table 2. presents the per hectare cost of cultivation of marigold across different farm-size groups. The total cost of cultivation, measured by Cost C, was ₹2,81,804.60, ₹2,85,308.00 and ₹2,92,052.30 per hectare for small, medium and large farms, respectively, with an overall average of ₹2,86,388.30 per hectare. The cost of cultivation increased with farm size, indicating relatively higher expenditure on different production inputs among large farmers.

11.	Incidental Charges (₹)	4995.88	1.77	5106.38	1.79	5302.71	1.82	5134.99	1.79				
12.	Repairs (₹)	1441.71	0.51	1460.83	0.51	1505.89	0.52	1469.48	0.51				
	Working Capital (₹)	149001.0	52.87	150083.0	52.60	153231.2	52.47	150771.8	52.65				
13.	Interest on Working Capital @ 6% (₹)	8940.06	3.17	9004.99	3.16	9193.88	3.15	9046.31	3.16				
14.	Depreciation on Farm Implements (₹)	2490.98	0.88	3626.36	1.27	4376.00	1.50	3497.78	1.22				
15.	Land Revenue and Taxes (₹)	157.25	0.06	158.39	0.06	164.68	0.06	160.11	0.06				
	Cost 'A'	160589.3	56.99	162872.8	57.09	166965.8	57.17	163476.0	57.08				
16.	Rental Value of Land (₹)	99193.06	35.20	98074.10	34.37	96398.43	33.01	97888.53	34.18				
17.	Interest on Fixed Capital @ 10% (₹)	3512.22	1.25	4053.61	1.42	5448.19	1.87	4338.01	1.51				
	Cost 'B'	263294.6	93.43	265000.5	92.88	268812.4	92.04	265702.5	92.78				
18.	Family Labour (Man-days)												
a)	Male	17.16	6862.96	2.44	18.80	7521.58	2.64	22.78	9113.65	3.12	19.58	7832.73	2.74
b)	Female	46.59	11646.99	4.13	51.14	12785.94	4.48	56.50	14126.19	4.84	51.41	12853.04	4.49
	Cost 'C'	281804.6	100.00	285308.0	100.00	292052.3	100.00	286388.3	100.00				
	Output (Qtls.) & Income (₹)	170.31	596101.8	168.40	589394.9	165.54	579378.7	168.08	588291.8				
	Per Quintal Cost (₹)	1654.61		1694.24		1764.27		1704.38					

(Figures in parentheses are the percentage to the cost C)

The major component of Cost C was working capital, which accounted for 52.65 per cent of the total cost. This was followed by rental value of land (34.18%), hired female labour (8.22%), plant protection charges (7.23%), machine power (5.98%) and family female labour (4.49%). Seedlings constituted 11.53 per cent of Cost C, indicating their important contribution to the total cost of marigold cultivation.

The overall Cost A was ₹1,63,476.00 per hectare, accounting for 57.08 per cent of Cost C, while Cost B was ₹2,65,702.50 per hectare,

accounting for 92.78 per cent of Cost C. The inclusion of family labour increased Cost B to Cost C by ₹20,685.80 per hectare.

The average yield of marigold was 168.08 quintals per hectare, generating an average gross income of ₹5,88,291.80 per hectare. The per quintal cost of production was ₹1,704.38. The findings indicate that marigold cultivation involved substantial expenditure on labour, seedlings, working capital and land, but the relatively high output and gross income suggest that the crop has considerable economic potential for farmers in the study area.

Table 3. Resource Utilization Pattern in Marigold Cultivation (Per ha.)

Sr.no.	Particulars	Small	Medium	Large	Overall
1	Total Human labour (Days)				
a	Male	25.20	26.86	30.89	27.65
b	Female	139.75	145.24	151.80	145.59
2	Seedlings (No.)	19371.39	19402.93	19486.06	19420.13
3	Manures (Qtls.)	17.64	17.72	18.13	17.83
4	Machine (Hrs)	32.56	34.04	35.91	34.17
5	Fertilizers (Kg.)				
a	N	89.77	91.88	92.10	91.25
b	P	86.07	86.21	87.75	86.68
c	K	75.50	75.64	76.82	75.99

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Sr.no.	Particulars	Small	Medium	Large	Overall
6	Weedicide (₹)	250.41	249.52	250.19	250.04
7	Micronutrient (₹)	19575.09	19776.20	19824.54	19725.28
8	Irrigation Charges (₹)	8270.30	8294.59	8308.32	8291.07
9	Plant protection charges (₹)	20962.96	20178.03	20945.04	20695.34
10	Yield Obtained (Qtls.)	170.31	168.40	165.54	168.08

Likewise, the application of farmyard manure varied only from 17.64 to 18.13 quintals per hectare, while machine power utilization increased gradually from 32.56 hours on small farms to 35.91 hours on large farms. The use of nitrogen, phosphorus and potassium fertilizers was comparatively higher on large farms, where the application reached 92.10 kg, 87.75 kg and 76.82 kg per hectare, respectively, indicating slightly greater adoption of recommended nutrient management practices by larger farmers.

The expenditure on micronutrients, irrigation and plant protection measures also showed only marginal differences across the farm-size

groups. Large farms recorded the highest expenditure on micronutrients (₹19,824.54 per hectare), irrigation (₹8,308.32 per hectare) and plant protection (₹20,945.04 per hectare), whereas medium farms incurred the lowest expenditure on plant protection measures (₹20,178.03 per hectare). The cost of weedicide application remained almost constant across all farm categories, averaging ₹250.04 per hectare. The yield obtained varied from 170.31 quintals per hectare on small farms to 165.54 quintals per hectare on large farms, with an overall average of 168.08 quintals per hectare.

Table 4. Per hectare costs, return, gross income, and B.C.ratio for Marigold Growers. (₹/ha)

Size groups						
Sr.no.	Particulars	Unit	Small	Medium	Large	Overall
1.	Total cost					
	i) Cost 'A'	Rs.	160589.38	162872.82	166965.84	163476.01
	ii) Cost 'B'	Rs.	263294.66	265000.53	268812.47	265702.56
	iii) Cost 'C'	Rs.	281804.61	285308.05	292052.32	286388.33
2.	Profit at					
	i) Cost 'A'	Rs.	435512.48	426522.13	412412.86	424815.82
	ii) Cost 'B'	Rs.	332807.19	324394.42	310566.23	322589.28
	Net return	Rs.	314297.24	304086.90	287326.39	301903.51
3.	Production	Qtls	170.31	168.40	165.54	168.08
4.	Gross income	Rs.	596101.85	589394.95	579378.70	588291.84
5.	B:C ratio					
	i) Cost 'A'		3.71	3.62	3.47	3.60
	ii) Cost 'B'		2.26	2.22	2.16	2.21
	iii) Cost 'C'		2.12	2.07	1.98	2.05

(Figures in parentheses indicates the percentage to the total)

5.2.3

Per hectare costs and returns from marigold

The per hectare costs and returns from marigold cultivation under different farm-size groups are presented in Table 5.9. The analysis indicated that marigold cultivation was a highly profitable enterprise across all categories of sample farmers. At the overall level, Cost 'A', Cost 'B' and Cost 'C' were estimated at ₹1,63,476.01, ₹2,65,702.56 and ₹2,86,388.33 per hectare, respectively. The corresponding returns over Cost 'A' and Cost 'B' were ₹4,24,815.82 and ₹3,22,589.28 per hectare, while the net return over Cost 'C' was ₹3,01,903.51 per hectare. The average gross income realized from marigold cultivation was ₹5,88,291.84 per hectare with an average flower yield of 168.08 quintals per hectare. These results clearly demonstrate the economic viability of marigold cultivation under the existing production conditions.

The comparison among farm-size groups revealed that small farmers realized the highest gross income of ₹5,96,101.85 per hectare, followed by medium farmers ₹5,89,394.95 and large farmers ₹5,79,378.70. Similarly, the return over Cost 'A' was highest on small farms ₹4,35,512.48 per hectare, followed by medium farms ₹4,26,522.13 and large farms ₹4,12,412.86. Returns over Cost 'B' also followed the same trend, amounting to ₹3,32,807.19, ₹3,24,394.42 and ₹3,10,566.23 per hectare on small, medium and large farms, respectively. Net returns over Cost 'C' were estimated at ₹3,14,297.24 on small farms, ₹3,04,086.90 on medium farms and ₹2,87,326.39 on

large farms. Although the total cost of cultivation increased with farm size, the gross income and net returns showed a declining trend, indicating comparatively higher economic efficiency on small farms due to better management of available resources and more intensive crop supervision.

The Benefit-Cost (B) ratio further confirmed the profitability of marigold cultivation. The B:C ratio over Cost 'A' was 3.71 on small farms, 3.62 on medium farms and 3.47 on large farms, with an overall average of 3.60. Likewise, the B:C ratio over Cost 'B' was estimated at 2.26, 2.22 and 2.16 on small, medium and large farms, respectively, with an overall average of 2.21. On the basis of Cost 'C', the B:C ratio was 2.12 on small farms, 2.07 on medium farms and 1.98 on large farms, resulting in an overall average of 2.05. The overall B:C ratio of 2.05 implies that every rupee invested in marigold cultivation generated a return of ₹2.05, confirming that the enterprise was financially rewarding. The positive net return of ₹3,01,903.51 per hectare further indicates that marigold cultivation is an economically sustainable and remunerative enterprise. Thus, the findings establish that efficient utilization of production resources and adoption of improved cultivation practices significantly enhanced the profitability of marigold cultivation in the study area.

Conclusion

Based on the findings of the present study, it was concluded that marigold cultivation is an economically viable and profitable commercial flower enterprise in Kolhapur district of Maharashtra. The average cost of cultivation (Cost 'C') was estimated at ₹2,86,388.33 per

hectare, while the average productivity was 168.08 quintals per hectare. The crop generated an average gross return of ₹5,88,291.84 per hectare and a net return of ₹3,01,903.51 per hectare. The Benefit-Cost ratio of 2.05 indicated the economic feasibility and profitability of marigold cultivation.

Among the different cost components, seedlings, hired female labour, plant protection chemicals, micronutrients and machine power constituted important shares of the total cost, while rental value of owned land was the major fixed cost component. Farm-size-wise analysis showed that small farmers achieved comparatively higher productivity and gross returns than medium and large farmers, indicating better utilization and management of available resources.

The resource-use efficiency analysis revealed scope for increasing the use of inputs such as seedlings, manures, nitrogen, phosphorus, potassium, weedicide and plant protection measures, whereas human labour, machine power, micronutrients and irrigation showed relatively higher utilization. Thus, optimum allocation and efficient utilization of production resources are essential for reducing production costs and enhancing profitability.

The study further indicated that direct marketing provided better price realization to growers by reducing the involvement of intermediaries. However, price fluctuations, perishability of flowers, high input and transportation costs, labour shortages and inadequate storage and market facilities remained important constraints.

Overall, the study concluded that marigold production has substantial potential for improving farm income in Kolhapur district. Greater emphasis on quality planting material, balanced input use, efficient resource management, improved post-harvest handling and promotion of direct marketing can further enhance the profitability and sustainability of marigold cultivation.

Suggestions

- Quality seedlings at reasonable prices should be made available to marigold growers to reduce the high cost of planting material and improve crop productivity.
- Farmers should adopt optimum and balanced use of fertilizers, manures, plant protection inputs and other resources to improve resource-use efficiency and reduce the cost of cultivation.
- The adoption of labour-saving technologies, farm mechanization and scientific crop management practices should be encouraged to reduce production costs and ensure timely farm operations.
- Technical guidance and training should be provided to farmers on efficient input management, scientific production practices and cost-reduction measures to enhance the profitability and economic sustainability of marigold cultivation.

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