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Resource Use Efficiency and Marketing of Chrysanthemum Flower in Tumkur District of Karnataka

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ABSTRACT

The floriculture in India has emerged as a fast growing sector in the recent years. In Karnataka, chrysanthemum flowers are being cultivated in an area of 4,884 hectares with the production of 56,674 metric tonnes (MT) and productivity of 11.60 metric tonnes per hectares (2010-11). Among all the districts in the state Tumkur district occupies first place in area (1162 ha) of chrysanthemum flower. The study revealed that the cultivation of chrysanthemum flower was significantly influenced by cost of human labour, FYM, fertilizers, plant protection chemicals and irrigation. It is worth noting that the elasticity of production of FYM was negative (-0.0271). This clearly indicated that the gross income of chrysanthemum flower declined with the increase in doses of FYM. And further it could be seen from the study the two important channels were identified, in that chnnel-I is most prominent and producer's share in consumer's rupee was more in channel-I of Sira (68.24%), Tumkur (69.30%) and Bangalore market (70.27%) than the channel-II of Tumkur (68.09%) and Bangalore market (65.76%).

Key words: *Resource use efficiency, Chrysanthemum flower, Production, Marketing, Marketing Channels.*

INTRODUCTION

The floriculture in India has emerged as a fast growing sector in the recent years particularly in the states of Karnataka, Rajasthan, Tamil Nadu, Andhra Pradesh, Maharashtra and West Bengal. In southern part of the country, chrysanthemum flower is mostly grown in farmer fields for supply to the markets as loose flowers for garlands, hair decoration by the ladies and for religious ceremonies. Yellow coloured flowers are preferred in south, while in North various hues of red, purple, yellow and white flowers are grown in abundance.

In Karnataka, chrysanthemum flowers are being cultivated in an area of 4,884 hectares with the production of 56,674 metric tonnes (MT) and productivity of 11.60 metric tonnes per hectares. In Tumkur district, fresh flowers are being cultivated in an area of 2,878 hectares, of which chrysanthemum flower occupied first place (1162 ha) followed by Jasmine-Multiflora (730 ha) and Aster (593 ha)[1]. Thus, a chrysanthemum flower forms an important flower crop of the district and promotes livelihood to the larger sector of the farming community.

The area under this crop is increasing year by year in the district. This flower crop is very often subjected to wide price fluctuations in the domestic markets. There is no systematic organising flower market like other fruits and vegetables markets.

Further, the study would highlight the benefits accruing to the farmers due to efficient use of resources in chrysanthemum flower production. The results of the study would also help in identify the different channels and to estimate the producer's share in consumer's rupee in chrysanthemum flower marketing. The specific objectives of the study were:

1. To study the resource use efficiency in chrysanthemum flower cultivation; and
2. To analyse the price spread in different channels of chrysanthemum flower marketing.

MATERIALS AND METHODS

The study was based on primary data during 2013-14. For evaluating the specific objectives of the study, important primary data relating to production of chrysanthemum flower was collected from the selected sample farmers in the study area. To study marketing costs, margins and channels of marketing the number of market functionaries, *viz.,* ten commission agents cum wholesalers, five retailers and five consumers from Bangalore, Tumkur and Sira markets were selected for the study.

To study the resource use efficiency in chrysanthemum flower cultivation Cobb-Douglas type of production function technique was employed.

Cobb-Douglas production function

Cobb-Douglas production function was tried to establish statistical relationship between selected inputs and gross income in chrysanthemum flower production. Finally Cobb-Douglas production function was selected as best fit on the basis of economic and statistical criteria. The ordinal least square technique was used to estimate the production function.

The variables included in the production function were as follows:

$$Y = f(X_1, X_2, X_3, X_4, X_5)$$

Where,

Y = Gross income of chrysanthemum flowers (Rs)

X_1 = Human labour charges (Rs)

X_2 = FYM (Rs)

X_3 = Fertilizer (Rs)

X_4 = Cost on plant protection chemicals (PPC) (Rs)

X_5 = Irrigation Charges (Rs)

The coefficient of multiple determination (R^2) was estimated and tested for its significance using F-test. To examine the resource use efficiency, the marginal value products (MVPs) of all those inputs which were found significant were worked out at their geometric mean level. The marginal value product i^{th} input was measured by using following formula:

$$MVP = b_i \frac{\overline{Y}}{\overline{X_i}} \times P_y$$

Where,

$\overline{Y}$ = Gross income per hectare from chrysanthemum flower at geometric mean level.

$\overline{X_i}$ = Geometric mean level of ith input.

b_i = production elasticity of ith input.

P_y = price of the product

The computed MVP of inputs was compared with their marginal factor cost (MFC) or the opportunity cost of input to draw inferences.

RESULTS AND DISCUSSION

The results presented in Table 1 explained that the cultivation of chrysanthemum flower in the study area was significantly influenced by cost of human labour, FYM, fertilizers, plant protection chemicals and irrigation. The coefficient of multiple determination was 0.89, which indicates that 89 per cent of variation in chrysanthemum flower income was explained by the five independent variables included in the model, remaining 11 per cent of variation in the gross income of chrysanthemum flower was explained by error term.

It is worth noting that the elasticity of production of FYM was negative (-0.0271). This clearly indicated that the gross income of

chrysanthemum flower declined with the increase in doses of FYM. This is mainly due to the fact that the farmers in the study area were applied excess of FYM as indicated by the ratio of MVP to MFC which is less than unity (-0.478) indicated that the resource was over utilized. Therefore it is suggested to educate the farmers to reduce the doses of FYM to optimum level. Regression coefficients with positive sign for inputs like human labour, fertilizer, plant protection chemicals and irrigation charges indicated that they will have a positive impact on the income of chrysanthemum flower with further application of these four resources in the production process[4]. The return to scale is 1.64 indicated that there is an increasing return to scale.

Marketing of chrysanthemum flower
Marketing functions
From the study it was revealed that harvesting, packing and transportation were the main marketing functions involved in the process of marketing of chrysanthemum. Flowers are packed in gunny bags. The chrysanthemum is being transported by trucks and buses. The producer sold their maximum quantity through commission agent cum-wholesaler and remaining growers sold through pre-harvest contractor. The commission agent charged a commission of 10 per cent of sale proceeds to the producer-seller.

Marketing channels
Two marketing channels have been identified in the study area are as follows:

Channel-I: Producer →Commission agent cum-Wholesaler → Retailer → Consumer.

Channel-II: Producer →Pre-harvest contractor→Commission agent cum-Wholesaler→ Retailer → Consumer.

As shown in Table 2 in case of Sira market all the farmers sold their produce through channel-I. Further, in Tumkur and Bangalore market, 70.15 and 56.88 per cent of the farmers sold their produce through channel-I respectively and remaining 29.85 and 43.12 per cent of the farmers sold their produce through channel-II respectively. 'On-farm sale' of chrysanthemum flowers to the pre-harvest contractor was preferred by the chrysanthemum producers. The results suggest that the chrysanthemum farmers may prefer the market sale over the on-farm sale despite the involvement of harvesting and marketing costs, because, market sales helped the farmers to realize higher net returns.

Marketing costs incurred by the producer
The total marketing cost per kg of chrysanthemum was estimated at Rs. 2.97, Rs. 3.6 and Rs. 4.23 under channel-I in the selected markets of the study area. Out of which, the significant item of cost was the commission charges accounting for Rs. 2.12, Rs. 2.56 and Rs. 2.86 per kg of Sira, Tumkur and Bangalore markets, respectively followed by transportation cost (Table 3). This calls for intensive control measure on part of the government to regulate the activities of commission agents and to reduce the commission charges to safeguard the interest of the farmers.

Marketing costs of pre-harvest contractor
The cost and returns to the pre-harvest contractor in marketing of chrysanthemum flower are presented in Table 4.

In Tumkur taluk the total cost incurred by the PHC was constituted both prices paid to the farmers (Rs. 2400 per Qtl.) and cost of marketing (Rs. 352.80) in which the major item farmed was commission charges (34.01%) followed by transportation (17.01%), miscellaneous charges (15.99%) and packing charges (14.27%). And net return realised by the PHC was Rs. 447.2 per quintal. Producer's share in consumer's rupee was 75 per cent.

Same trend was observed in Koratagere taluk, the total cost incurred by the PHC was Rs. 2971.55 it includes both price paid to the farmers (Rs. 2556 per qtls.) and marketing cost (Rs. 415.55). Among the marketing cost major item of total cost was commission charges (30.80%) followed by transportation charges (23.16%) and miscellaneous charges (16.03%). Net return realised by the PHC was Rs. 308.45 it is less compares to Tumkur taluk it was due to that, the PHC in Koratagere taluk sold their produce to Bangalore market; it was far away from the taluk hence PHC need to incur more amount on transportation. Producer share in consumer rupee was 77.92 per cent[3].

Producer's share in consumer rupee

It was clear from the Table 5. Producer's share in consumer's rupee was higher in channel-I of Sira (68.24%), Tumkur (69.30%) and Bangalore market (70.27%) than the channel-II of Tumkur (68.09%) and Bangalore market (65.76%). Producer's share in consumer's rupee was higher in channel-I of all the markets compared to channel-II this might be presence of additional market intermediaries in channel-II of both the markets.

The previous analysis specified that producers got the maximum net price per quintal in channel-I and minimum in Channel-II of Bangalore market, same trend was observed in Tumkur market. Henceforth, it could be incidental that channel-I in Bangalore market was superior compared Tumkur and Sira markets. However, Channel-I was found to be the most common channel in both the markets for disposal of chrysanthemum flower by the farmers. Efforts have to be made to minimize village sales so as to provide a higher share of the consumer's rupee to chrysanthemum flower growers. Equally, care has to be paid for reducing the costs and profit margins of wholesalers and retailers as they grab nearly 40 per cent of the consumer's rupee. This could cover the way for improvement in the share of producer's in consumer's rupee. The producer's share in consumer's rupee was more than the study conducted by Balsing[2], in Bombay market because of number of intermediaries in the all channel was less compare to previous study.

Table 1: Estimates of Cobb-Douglas production function in chrysanthemum flower cultivation

SN	Particulars	Parameters	Regression coefficients	MVP:MFC ratios
1	Intercept	a	-0.7399 (1.243)	
2	Human Labour	b_1	0.2095** (0.106)	5.680
3	Farm yard manure	b_2	-0.0271 (0.026)	-0.478
4	Fertilizer	b_3	0.0901 (0.090)	5.709
5	Plant protection chemicals	b_4	0.5082* (0.150)	44.315
6	Irrigation Charges	b_5	0.8637* (0.284)	37.787
		R^2	0.89**	
		Returns to scale	1.64	

Figures in parentheses indicate standard error.

*Significant @ 1% level of probability ** Significant @ 5% level of probability

Table 2: Quantity of chrysanthemum flower moved through various marketing channels

(n=60)

SN	Channel	Sira		Tumkur		Bangalore	
		Qty sold (qtl)	No. of farmers	Qty sold (qtl)	No. of farmers	Qty Sold (qtl)	No. of farmers
1	P→ C /WS → R→C	131 (100)	20	141 (70.15)	14	109.50 (56.88)	12
2	P→PHC→ C/WS → R→ C	0.0 0.0	0	60 (29.85)	6	83.00 (43.12)	8
	Total	**131 (100)**	**20**	**201 (100)**	**20**	**192.50 (100)**	**20**

Figures in parentheses indicate percentage to total

Note: P- Producer, C /WS- Commission agent cum-wholesaler, R- Retailer, C- Consumer and PHC- Pre-harvest contractor. n=number of farmers.

Table 3: Marketing costs incurred by the producers in the sample markets

(Rs. /kg)

SN	Particulars	Sira Market	Tumkur Market		Bangalore Market	
		Channel-1	Channel-1	Channel-2	Channel-1	Channel-2
1	Packing cost	0.40 (13.47)	0.43 (11.88)	0 0	0.50 (11.8)	0 0
2	Transportation cost	0.45 (15.15)	0.63 (17.40)	0 0	0.87 (20.6)	0 0
3	Commission charges	2.12 (71.38)	2.56 (70.72)	0 0	2.86 (67.6)	0 0
	Total	**2.97 (100)**	**3.62 (100)**	**0 0**	**4.23 (100)**	**0 0**

Figures in parentheses indicate percentage to total.

Table 4: Cost and margin for the Pre-harvest contractor (PHC) in selected taluks

(Rs. /Qtl)

SN	Particulars	Tumkur taluk	Koratagere taluk
A)	**Price paid to the farmers**	2400.00	2556.00
B)	**Costs in marketing**		
1	Harvesting cost	22.48 (6.37)	24.91 (5.99)
2	Packing Charges	50.35 (14.27)	54.47 (13.11)
3	Transportation	60.00 (17.01)	96.26 (23.16)
4	Labour charges	43.56 (12.35)	45.29 (10.90)
5	Commission charges	120.00 (34.01)	128.00 (30.80)
6	Miscellaneous charges	56.41 (15.99)	66.62 (16.03)
	Total cost in marketing(B)	**352.80 (100.00)**	**415.55 (100.00)**
7	Total costs to the PHC(A+B)	2752.80	2971.55
8	Sale price of flowers	3200.00	3280.00
9	Net return	447.2	308.45
10	Producer share in consumer's rupee (%)	75.00	77.92

Figures in parentheses indicate percentage to total marketing cost.

Table 5: Marketing costs and margins in marketing of chrysanthemum flower through different channels

(Rs. /Qtl)

SN	Particulars	Sira Market	Tumkur Market		Bangalore Market	
		Cahnnel -I	Cahnnel -I	Cahnnel-II	Cahnnel-I	Cahnnel-II
1.	**Marketing cost incurred by**					
a)	Producer	297 (6.76)	362.00 (7.60)	0 (0)	423 (8.26)	0 (0)
b)	Retailer	21.12 (0.48)	28.45 (0.60)	26.08 (0.55)	39.18 (0.76)	36.68 (0.66)
c)	Commission agent cum-wholesaler	21.9 (0.50)	32.64 (0.69)	31.37 (0.67)	41.96 (0.82)	41.15 (0.74)
d)	Pre-harvest contractor	0 (0)	0 (0)	352.8 (7.51)	0 (0)	415.55 (7.49)
	Total marketing cost	**340.02 (7.73)**	**423.09 (8.88)**	**410.25 (8.73)**	**504.14 (9.84)**	**493.38 (8.89)**
2.	**Marketing margin received by**					
a)	Retailer	578.22 (13.20)	571.55 (12.00)	373.92 (7.96)	560.82 (10.95)	513.62 (9.25)
b)	Commission agent cum-wholesaler	478.10 (10.90)	467.36 (9.80)	368.63 (7.84)	458.04 (8.94)	478.85 (8.63)
c)	Pre-harvest contractor	0 (0)	0 (0)	347.20 (7.39)	0 (0)	414.45 (7.47)
	Total marketing margins	**1056.32 (24.00)**	**1038.91 (21.80)**	**1089.75 (23.19)**	**1018.86 (19.89)**	**1406.92 (25.35)**
3.	Producer's net share	3000.00	3300.00	3200.00	3600	3650
4.	Consumer's price	4396.34 (100.00)	4762.00 (100.00)	4700.00 (100.00)	5123 (100)	5550.3 (100)
5.	Producer's share in consumer's rupee (%)	**68.24**	**69.30**	**68.09**	**70.27**	**65.76**

Figures in parentheses indicate percentage to the consumer's price.

CONCLUSION

The ratio of MVP to MFC was negative for FYM (-0.478) indicated that the resource was over utilized. The ratios of MVP to MFC were positive and more than unity for human labour (5.680), fertilizer (5.709), plant protection chemicals (44.31) and irrigation charges (37.78) indicated that these resources were underutilized. The underutilized resources can be used optimally in order to get maximum returns from the chrysanthemum cultivation.

Major quantity of chrysanthemum flower was sold through channel-I in selected markets of the study area. Commission charges and transportation charges were major items of marketing cost and producer share in consumer's rupee was more in channel-I of all the selected markets. Channel-I under Bangalore market was superior to others. Proper marketing facilities need to be developed in the study area, and further, there is a need to establish regulated market for floriculture crops like of fruits and vegetables. Chrysanthemum flower need to put under the list of notified commodities and commission charges taken from producer can be strictly prohibited.

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