



Peri urban floriculture: A comparative study from NCR on production, value addition, marketing and constraints

RESHMA GILLS¹, J P SHARMA², R R BURMAN³, R R SHARMA⁴ and AMIT KAR⁵

ICAR-Indian Agricultural Research Institute, New Delhi 110 012

Received: 6 June 2016; Accepted: 3 November 2016

ABSTRACT

Floriculture sector in India is gaining momentum in the contribution of economic well being of the small and marginal farmers due to its vast entrepreneurial potential. Even if the flower industry is flourishing, farm gate price to the farmers is very low owing to post harvest losses and intervention of middle men in marketing. Post harvest operation and value addition in the flower is an important option to decrease the losses and increase the net returns to the farmers. An attempt has been made here to identify marketing channels, marketing efficiency and price spread of the identified marketing channels among flower producers and processors in Faridabad district of Haryana state. Study revealed a statistically significant higher net income to the processors ($t = 44.030$, $p < 0.05$) even if cost of production for the value added flower is high ($t = 4.154$, $p < 0.05$). Producers share in consumers' price showed huge variation among different identified channels. Increasing demand of flower products in urban areas motivated the processors to do the value addition (Mean Rank of Friedman's Test is 9.75). Kruskal-Wallis one-way ANOVA ($\chi^2 = 30.424$, $df = 3$, $p < 0.05$) employed for the identification of the constraints revealed that market related constraints were severe one. Present study highlighted the importance of market intelligence and timely accessibility of sufficient decision supporting data to manage and market the flower products.

Key words: Constraints, Marketing efficiency, Motivator, Price spread

The importance, utility and value of floriculture have been noticed throughout the mankind from historical period. It is a profitable venture with enormous entrepreneurial potential. In many countries, floricultural products are amongst the main export items of agricultural origin (Sudhagar 2013). Floriculture is the major area in agriculture and allied sector in India. About 255020 ha of area across the country is used for floriculture, producing 17, 54,490 metric tonnes (Mt) of loose flowers and 542530 metric tonnes (Mt) of cut flowers (NHB 2015). Changing life style in India, has given a momentum to the floricultural industry as flower decoration in the home, office, ritual functions and ceremonies is growing at a whopping speed of 30% per annum. Improvement in the general level of well being in the country and increased prosperity particularly among the middle class is also another reason for increase in the volume of local flower market (Kumar 2014). Government of India has identified floriculture as a sunrise industry and accorded 100 per cent export oriented status to this sector.

Owing to steady increase in demand of flower, floriculture has become one of the important Commercial items in Agriculture. Marketing pattern of the flowers has been changed tremendously in India. Urban and periurban areas have been hosting biggest flower markets in our nation due to its increased need and demand. Cut flowers, potted plants and bedding plants are available at florists, supermarkets, corner grocery stores, mass-market outlets and garden centers. More people are buying flowers at their supermarket as part of their weekly grocery shopping. Another shift in marketing is the move towards more direct farm marketing. Even if the shift in marketing of fresh flowers is well evident, farm gate profit for the floriculture industry is very less due to lack of post harvest value addition. The majority of the flower farmers sell their produce to the commission agents in the flower *mandi* without any value addition. The retailers cum processors are reaping the astonishing benefits out of it. Besides, nearly 20-40 per cent of the cut flowers produced are lost due to faulty harvesting, post harvest handling, storage, transportation and marketing (Anonymous 2015). Post harvest management and value addition in the floriculture sector is very much vital for the economic well being of the flower farmers. In this context, an attempt has been made in this paper to analyze cost-benefit, efficiency of marketing channels and constraints faced by the flower processor in comparison with the flower producers.

¹Scientist (e mail: reshma1818@gmail.com), ²Joint Director, (Extension) (e mail: jd_extn@iari.res.in), ³Principal Scientist (e mail: rroyburman_extn@iari.res.in), Division of Agricultural Extension, ⁴Principal Scientist (e mail: rrsharma@iari.res.in), Division of Food Science and PHT, ⁵Principal Scientist (e mail: amitkar@iari.res.in), Division of Agricultural Economics.

MATERIALS AND METHODS

The study was purposively conducted in Faridabad district (coming under peri urban area of NCR) of Haryana state. Haryana state is contributing about 4 per cent of cut flower production in India (NHB 2015). The main flowers grown in Haryana are marigold, rose, tuberose and gladiolus. Gladiolus, rose and tuberose is mainly produced from Faridabad district of Haryana (NHM 2005). A pilot study was conducted before the actual start of research work to check the availability, collection and compilation of producers and processors list from the study area. To study the determinants and generalize the findings among flower processors (processors are producers also) and flower producers, tuberose and gladiolus were selected purposively, since the pilot study revealed the predominance of the processors of these two flower crops in the study area. Farmers were selected from the identified list with the purpose of validating and checking reliability of the scale developed for identifying the motivating factors of post harvest decision making and constraint in flower processing. Finally 20 respondents comprised 10 processors (processing includes grading, cold storage, garland and flower bouquet preparation etc.) and 10 flower growers were selected randomly for the actual measurement of different variables like market channel identification, measurement of marketing efficiency in different identified channels and the factors contributing to the post harvest decision taking and constraints faced by them. For the identification of different marketing channels detailed personal interview of intermediaries, market personnel were also carried out. Data collected were analysed with the help of SPSS 20.0 and Excel Stat software to draw valid conclusion. For the comparison of average cost of production and average net income of flower farmers and processors Students't test was used. For analysing the marketing efficiency in different channels recognized in the study area Shepherd's (1972) marketing efficiency index and Acharya's marketing efficiency index (Acharya and Agarwal 2001) were used.

Shepherd's Method

$$MEI = \frac{V}{I} - 1$$

MEI= Marketing Efficiency Index, V= value of goods sold/ consumer price of goods, I= Total marketing cost present in particular channel.

Acharya's method

$$MEI = \frac{\text{Net price received by Farmer}}{\text{TMM} + \text{TMC}}$$

MEI= Marketing Efficiency Index, TMM = Total marketing margin, TMC = Total marketing cost.

A Likert like summated rating scale was adopted for measuring the motivating factors in post harvest decision making among processors (Likert 1932). Selection of the items was in line with the criteria suggested by Edward (1969). From the comprehensive list of identified motivating factors and constraints prepared for flower processors,

rating scales were constructed. Reliability of the scales was estimated in internal consistency or split half method. Coefficient of internal consistency (Spearman's rho) of scale to measure motivating factors and constraints are 0.72 and 0.843 respectively. In order to avoid or nullify the problems associated with the grouping, Cornbach alpha coefficient (1951) has been used. Cornbach alpha coefficient of the rating scales are 0.76 and 0.927. Validity of the scale was measured with juries' opinion method. Since, the observations were on ordinal level of measurement, data collected under these variables were analysed and interpreted on the basis of nonparametric tests, viz. Kruskal-Wallis's one-way ANOVA and Friedman's two-way ANOVA. Multiple pair wise comparisons using Nemenyi's procedure/Two-tailed test was also conducted for finding significant difference among each factors and placing them in homogenous groups (Siegel and Castellan 1988).

RESULTS AND DISCUSSION

Average net income and average cost of production of flower processors and producers

Average net returns and average cost of production of flower and value added flower (Tuberose and gladiolus), were calculated/ha. Average cost of production of these flowers in the study area has been observed as almost same in all case. Average production of tuberose is about 1.4-1.8 lakh spikes/ha. Average farm gate price for the tuberose is about 2.5-3.5 ₹/spike and that for gladiolus is about 2-4 ₹/spike. Value added flowers price for both of the selected flowers was ranging from ₹ 6/spike to ₹ 10/spike. For calculation of net returns average farm gate price for tuberose and gladiolus in processed form and fresh form was considered. Since the flower processors in this study were flower growers also, total cost of production of processed flower includes cost of production and cost of value addition. From the Table 1, it is obvious that total cost of production of processed flower/ha was ₹ 448767.8 ± 16962.6, whereas total cost of production of flower was about ₹ 364920.0 ± 10944.1. While considering net returns, it was found that net returns/ha of processed flower was ₹ 867232.2 ± 16364.38 and for fresh flower it was about ₹ 130230.0 ± 3519.50. Statistically significant difference was found in between the flower processors and flower producer, in terms of total cost of production ($t = 4.154$, $p < 0.05$) and net returns ($t = 44.030$, $p < 0.05$). These findings were on par with the results of Sharma *et al.* (2014) and Balamurugan *et al.* (2014). Singh *et al.* (2013) showed that the return per rupee of investment were estimated to the ₹ 1.66, ₹ 2.08 and ₹ 1.84, on small size, large size farms and overall, respectively in case of marigold.

Marketing channels and marketing efficiency

Detailed interview of processors, producers and market intermediaries in the study area (Faridabad) revealed that there were total of four different well established marketing channels in flower sector. As the number of middle men

Table 1 Average cost of production and average net returns of flower processors and flower producers

Cost/ Returns (₹/ha)	Flower	Mean	Std. error of mean	Levene's Test	t-test for equality	t-test for equality
				for equality of variances	of means (Equal variances)	of means (Unequal variances)
				F	t, DF	t, DF
				(Prob. F)	(Prob. t)	(Prob. t)
Total cost	Processor	448767.8	16962.6	3.608 (p=.074)	4.154, 18 (p=0.001)	4.154, 15.386 (p=0.001)
	Producer	364920.0	10944.1			
Net returns	Processor	867232.2	16364.38	17.462 (p=.001)	44.030, 11.823 (p<0.001)	44.030, 9.831 (p<0.001)
	Producer	130230.0	3519.50			

*DF=Degrees of freedom; F=Value of the F-statistic; t= Value of the t statistic.

increases huge difference was found in market margin and price spread among these channels.

There were two channels present among processor and producer of flower in study area. Channel I for the flower processor was the direct selling channel and channel II was with one intermediary person in between processor and end users. Channel I in the raw flower (without any value addition) was identified as Producer – Retailer - Consumer and Channel II in this case was lengthy channel with many players, viz Producer – Wholesaler - Retailer/ Processor - Consumer. There is no direct selling channel for raw flowers, observed in the study area. Similar results were found by Taj *et al.* (2013) with two identified marketing channels in flower. In the first channel the main players were producers, wholesalers-cum-commission agents, retailers and consumers. Channel II was Producer – Retailer - Consumer. In Channel-II producer's share in consumers' price was up to 46.86%. Another study by Raina *et al.* (2011) showed that all the respondents under their consideration sold their flowers to the markets as raw. Further, majority

of the respondents market their produce in the main season only without grading in the nearby market. Most of the respondents sold flowers to the small processor at the farm site itself. On an average the retailers price varies between one-and-a half times to four times more than the farm gate price (Bhattacharyya 2013)

From the Table 2, it is clear that net return of the flower producers (Channel I 130087.3 ₹/ha, Channel II 47562.3 ₹/ha) was low as compared to the flower processor in all channels (Channel I, 917487.3 ₹/ha and 405987.3 ₹/ha in channel II). Producers share in consumers' price was 100 per cent in direct selling channel of processed flower. There was a remarkable decrease of producers share in consumers' price in Channel II (40%) as compared with Channel I of processed flower. In case of unprocessed or raw flower, producers share in consumers' price was about 24% in channel I and 16.66% in channel II. Since, Acharya's marketing efficiency index has been decreased from Channel I (1.48) to channel II (0.50), it can be inferred that direct selling of processed flower resulted in more

Table 2 Average price spread in different marketing channels with respect to value added flower and raw flower

Cost/ Returns	₹ /ha			
	Flower processors		Flower producers	
	Channel I	Channel II	Channel I	Channel II
Cost of production	446370	446370	364920	364920
Marketing cost of producer/processor	142.7	142.7	142.7	142.7
Gross returns to producer/processor	1364000	852500	495150	412625
Net returns of producer/processor (MM) (3-(1+2))	917487.3	405987.3	130087.3	47562.3
MC of wholesaler	0.0	0.0	0.0	142.7
MM of wholesaler (7-3+5)	0.0	0.0	0.0	82382.3
Gross price to wholesaler	0.0	0.0	0.0	495150
MC of retailer	0.0	6.4	1612.7	1457.7
MM of retailer (10-7+8)	0.0	1278743.6	1566362.3	1979142.3
Consumer price	1364000	2131250	2063125	2475750
Producers share in consumers price (3/10)*100	100%	40%	24 %	16.66%
Marketing efficiency (Shepherd)	9558.5	14294.1	1175.3	1420.3
Marketing efficiency (Acharya)	1.48	0.50	0.29	0.19

profit to processors. Similarly in case of raw flowers also there was a drastic change in marketing efficiency index from channel I (0.29) to channel II (0.19). In this case also, when channel length is more efficiency is less. These results were in consistent with findings of Hyma Jyothi and Raju (2003); Kumar (2014) and Singh *et al.* (2013). It is well accepted that flowers sold to the consumers in value added forms such as flower basket, garland and in other forms as demanded by the buyers, provides remunerative returns. The marketing cost and marketing margin (Price spread) differ from the channel to channel. The marketing cost and margins also depend upon the form in which the product reaches the ultimate consumers. Similar results were found in the study of Balamurugan *et al.* (2014).

Factors for post harvest decision making among flower processors

Likert like rating scale constructed with 13 different factors which are relevant to the present study was given to the flower processors and asked to rank their preference on a three point continuum (1 = least important, 2= important, 3 = most important). Total score of each component was taken into account. These factors were compared using Friedman's two-way ANOVA. From the test statistic ($\chi^2 = 54.476$, $df = 12$, $p < 0.05$) it can be inferred that the level of influence of different factors to the post harvest decision making among flower processors was different according processors perception.

Since, urban people and offices are more concerned about the appearance of the office building and its interior design, it was found that decoration of house or office with flower is a habit among modern people. In this generation, people are more conscious about giving warm gifts to

Table 3 Influencing factors for post harvest decision making among flower processors based on mean ranks of Friedman's test

Factors	Mean Rank	Groups**
Increasing demand in urban areas	9.75	A
To avoid distress sale	9.65	A
Marketed and marketable surplus availability	9.60	A
Price of value added product	9.50	A
High market margin obtained	9.35	A
To minimize wastage	8.95	A
Transportation facilities to market	6.45	A
Skilled labour availability	5.40	B
Changing consumer needs	4.80	B
Consumer satisfaction and loyalty	4.55	B
Competition from the market	4.55	B
Rising disposable income in hand	4.40	B
Branding and new look of products	4.05	B

**Mean ranks having same letters are not significantly different.

friends and relatives on special occasions especially in urban areas. Because of these reasons urban people are the main end users of flowers. Based on the processors perception, increasing demand in urban areas (Mean Rank 9.75) for the value added flowers motivated them to do the post harvest operations in flower (Table 3). Flower processors in this study are producers also, and they were well experienced with the malpractices of middlemen in fresh flower market. Many times they were compelled to sell the produce for low price or even discarded in market. Because of these bitter experiences they marked, to avoid distress sale of flower (Mean Rank 9.65) as second most important element which motivated them to do post harvest operations in flower. It was followed by marketed and marketable surplus availability and price of value added product with mean ranks 9.60 and 9.50, respectively. It is because the productivity in the study area is very good and flowers are much in quantity to be marketed. Fresh flowers of both the tuberose and gladiolus used to sell by the farmer on an average at the rate of ₹ 3/ spike. But the value added flower could able to fetch an average rate of ₹ 8/spike. Since processors were selling their products on demand basis and mainly following the shortest channel, market margin obtained due to elimination of middle man (Mean Rank 9.35), also was a significant motivator to the processors to undertake value addition of the flowers. Consumer satisfaction and loyalty (Mean Rank 4.55) and competition from the market (Mean Rank 4.55) were less important motivators to flower processors. Processors of the study area were selling the flower products without any brand name, hence rising disposable income in hand (Mean Rank 4.40) and branding and new look of products (Mean Rank 4.05) has been identified as least important motivating factors among the flower processor to take post harvest decision on flower. Motivators were clubbed in two distinct homogenous groups on the basis of multiple comparison.

Major constraints of existing post harvest management mechanism in flower

Four major constraint categories which are relevant to present study (Technical and capacity building related constraints, Infrastructure related constraints, Financial constraints and Market related constraints) were identified. The constraints were compared using Kruskal-Wallis one-way ANOVA for the identification of severe one. The test ($\chi^2 = 30.424$, $df = 3$, $p < 0.05$) revealed that, there exist a significant difference among the level of influence of different constraints to existing post harvest management mechanism in flower according to processors' perception. Further multiple comparison procedure revealed the existence of two different homogenous severity levels of these constraints.

The mean rank corresponding to market related constraints (32.6) was more hence it was the major constraint to existing post harvest management mechanism in flower. Least affecting constraint was technical and capacity building related constraints (8.65), whereas infrastructure

Table 4 Severity of technical and capacity building related constraints among flower processors

Factors	Mean rank	Groups**
Low cohesion in groups	7.50	A
Lack of knowledge about trading options (future and forward)	7.45	A B
Lack of training	4.90	A B
Non availability of suitable and improved machineries for processing	4.55	A B
High cost involved in purchase of suitable machineries	4.55	A B
Inadequate technical capacity	4.20	A B
Lack of feedback/ success stories in media	4.10	A B
Lack of proper knowledge about harvesting time	4.05	A B
Lack of motivation	3.15	

**Mean ranks having same letters are not significantly different.

related constraints was less severe with mean rank of 12.5. Financial constraint with mean rank of 28.4 was also identified as moderately severe constraint to the flower processors. Further analysis of the each category of the constraints was conducted using the Friedman's test. From the test statistic value and its significance it is clear that each component in each category varied in flower processors view.

Since, Friedman's test statistic is $\chi^2 = 33.378$, $df = 8$, $p < 0.05$, nine different elements under technical and capacity building related constraints were identified with differential level of severity among flower processors. Even though flower production in the study area has been done on a group basis, there is lack of group marketing among the flower processors. Even if one person is having a selling point in the market, it has been noticed that other persons were not allowed to sell their products there or near to that. Since, getting the place to display and sell the flower is the major difficulty among the processors; they identified low cohesion in groups (Mean Rank 7.50) and lack of knowledge about trading options (Mean Rank 7.45) as two major constraints among them (Table 4). Even if many training programmes of different ministries were operationalized in the study area, none of them was addressing the postharvest management and value addition of the flowers. Farmers were developed their own age old technologies for value addition and increasing the keeping quality of the flowers. Hence, lack of training programmes, non availability of improved technologies for processing were identified as moderately severe constraints for them. Since, processors were self motivated and engaged actively in the processing and marketing of the flower products, lack of motivation was the least severe technical and capacity building related constraint for the flower processors. Study results were consistent with the findings of Bhosale *et al.* (2011) and Kunuku *et al.* (2013).

Lack of marketing yards/ places was with highest mean

Table 5 Severity of infrastructure related constraints among flower processors

Factors	Mean rank	Groups**
Lack of marketing yards/ places	8.35	A
Lack of proper roads and transportation	7.30	A B
Poor infrastructure for storage	7.30	A B
Lack of regular supply of power and electricity	4.40	B C
Lack of proper packaging facilities	4.00	B C
Non availability of skilled labour	3.65	B C
Lack of proper grading facilities	3.60	B C
Lack of cold chain management	3.20	C
Non availability of machineries in local places	3.20	C

**Mean ranks having same letters are not significantly different.

rank (8.35) among infrastructure related constraints and hence it was the major one (Table 5). Farmers need to travel from different places to the Gazipur flower market for selling the flower products. While transportation of flowers they faced many difficulties in crossing the state border. There was no any crop insurance on flower and they were not having any specific structure to keep the flower as fresh throughout the journey because of these reasons processors marked lack of proper roads and transportation and poor infrastructure for storage as second highest in severity ranking, whereas lack of cold chain management and non availability of processing machineries in local places were identified as least severe constraints to flower processors. Friedman's test statistic ($\chi^2 = 60.361$, $df = 8$, $p < 0.05$) revealed the differential level of severity of infrastructure related constraints among flower processors. Three different homogenous groups have been identified among infrastructure related constraints while the administration of multiple comparison. These results are in line with the findings of Omar *et al.* (2014).

Friedman's test statistic for financial constraints is $\chi^2 = 68.528$, $df = 8$, $p < 0.05$. It is well evident from the results that level of influence of different financial constraints was different on post harvest management of flower based on the processors perception. Flowers are highly perishable and need to sell immediately. Farmers are taking loan from bank and other money lenders with high interest for the cultivation of flowers and its processing. Due to the perishable nature and need for liquid cash farmers are selling the flowers even in low price. Distress sale of produce due to need of immediate liquid cash and high rate of interest for credits were with highest mean rank among the financial factors (Table 6), hence these were the most severe constraints to

Table 6 Severity of financial constraints among flower processors

Factors	Mean rank	Groups**
Distress sale of produce due to need of immediate liquid cash	7.70	A
High rate of interest for credits	7.55	A
Lack of awareness about government support policies	6.90	A
Lack of price policy by the government	6.70	A
Lack of finance	6.00	A B
Long payback period for investment	2.85	B
Lack of awareness about credit availability	2.70	B
High cost of skilled labour	2.30	B
Lack of banking facilities near by	1.80	B

**Mean ranks having same letters are not significantly different.

the flower processors. From the processors response it was clear that there has been accessibility to banks and credits to them and all of the respondents were trained to make value added flowers. Hence they recognized high cost of skilled labour and lack of banking facilities nearby as two least severe financial constraints to them. Distress sale of produce due to need of immediate liquid cash, high rate of interest and lack of awareness about government support policies have been identified as on par in their extent of severity in multiple comparison procedure.

Test statistics of Friedman's two way ANOVA for market related constraints is $\chi^2 = 70.491$, $df = 8$, $p < 0.05$. Flower prices usually fluctuate with season, availability and demand from the consumer side. Farmers from the study area were lacking the price information of the flower and flower products in advance. In many occasions, processors were bringing their products to the market and because of middle men interventions they could not able to sell or even display their products in the market place. Due to this reasons lack of market intelligent and market facility and lack of appropriate marketing channel were identified as major market related constraints by the flower processors (Table 7). Less knowledge about marketing strategies and large numbers of middlemen were recognized as moderately severe market related constraints by the flower processors. Least severe among the identified market related constraints were produce has low market value due to poor appearance and price risk and uncertainty with mean rank of 2.60. Lack of market intelligence, market facility and marketing channels were identified as on par with the effect. Similar results were also reported by Gudeta (2012), Jayaram *et al.* (2014) and Nusrat Hasan Mou (2012)

Since, flower is a highly perishable commodity, marketing is a big problem. Production of flowers is in rural areas but their main consumers are in cities. In rural areas demand for flower is only on special occasions like

Table 7 Severity of market related constraints among flower processors

Factors	Mean rank	Groups**
Lack of market intelligence and market facility	8.05	A
Lack of appropriate marketing channel	7.70	A
Less knowledge about marketing strategies	7.50	A B
Large numbers of middlemen	6.60	A B C
Difficulties of contract enforcement with dealers	3.80	B C D
Inability to meet standards as prescribed	3.10	C D
Inability to find market for value added produce	3.05	C D
Produce has low market value due to poor appearance	2.60	D
Price risk and uncertainty (market value vary widely between the time of harvest and the time of local shortage)	2.60	D

**Mean ranks having same letters are not significantly different.

marriage and festivals. So the growers need to find market in urban areas. Flower producers were facing many problems in the marketing and market places itself. The present study highlighted the importance of market intelligence and timely accessibility of sufficient decision supporting data to manage and market the flower products. Since, flower and value added products of flower are not covered under any government regulated money policies; fluctuation in the price is severely affecting the producer, processor and consumers. There should be a proper implementation of policy, in regard of market accessibility to the farmers. The present study also suggests the need of farmer representative in the flower *mandi* regulation committee, for the judicious and transparent implementation of rules and regulations.

ACKNOWLEDGEMENT

Authors are thankful to farmer and processor respondents, Mr Bachoo Singh and Mr Mukesh Yadav (Progressive farmers) for their support during the data collection. First author is thankful to Department of Science and Technology, Government of India for providing the financial assistance in the form of INSPIRE Fellowship to carry out the research.

REFERENCES

- Acharya S S and Agarwal N I. 2001. *Agricultural Marketing in India*. Oxford and IBH Publishing Co. Pvt Ltd, New Delhi.
- Anonymous. 2015. Edge India Agrotech. Postharvest handling practices for cut flowers. <http://www.edgeindiaagrotech.com/post-harvest-cut-flowers>
- Balamurugan L, Tamizh Jyothiand K and Samudhra Rajkumar

- C. 2014. Production, post harvest handling and marketing of cut-flowers in Tamil Nadu. *International Journal of Recent Scientific Research* 5(11): 2 117–22.
- Bhattacharyya R. 2013. Cut flower production: A source of incremental income for the marginal farmers of the state of West Bengal in India. *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering* 7(6): 1 398– 1406.
- Bhosale M Y, Shelke R D, Aher V K and Shenewad B A. 2011. Production and marketing of Gerbera cut-flowers. *International Research Journal of Agricultural Economics and Statistics* 2(2): 328–31.
- Cornbach L J. 1951. Coefficient alpha and the internal structure of tests. *Psychometrika* 16(3): 297–334.
- Edwards A L. 1969. *Techniques of Attitude Scale Construction*. Vakils, Feffer and Simons Pvt. Ltd., New York.
- Gudeta D T. 2012. ‘Socio-economic and environmental impact of floriculture industry in Ethiopia, Master’s thesis, Ghent University, Belgium. Retrieved from www.fao.org.
- Hyma Jyothi S and Raju V T. 2003. Study on marketing of crossandra, jasmine and rose flowers in East Godavari district of Andhra Pradesh. *Agricultural Marketing* 46(2): 2–4.
- Jayaram M S, Sachin Hundre, Prasanna Kumar P S and Ranjith Kumar P S. 2014. Infrastructure inadequacies for marketing of cut flowers in major markets of Karnataka. *Journal of Science* 4(4): 215–20.
- Kumar R S. 2014. Marketing of flowers in India. *International Journal of Informative and Futuristic Research* 2(3): 690–5.
- Kunuku S H, Hyma Jyothi S and Mayuri Koripalli. 2013. Profitability and constraint analysis of commercial floriculture nursery management in east Godavari district of Andhra Pradesh. *International Journal of Innovative Research and Development* 2(11): 178–84.
- Likert R. 1932. A technique for the measurement of attitudes. *Archives of Psychology* 22(140): 1–55.
- NHB. 2015. Indian Horticulture Data Base. http://nhb.gov.in/area-pro/NHB_Database_2015.pdf
- NHM. 2005. National Horticulture Mission Action Plan for Haryana. http://nhm.nic.in/actionplan/actionplan_haryana.pdf
- Nusrat Hasan Mou. 2012. Profitability of flower production and marketing system of Bangladesh. *Bangladesh Journal of Agricultural Research* 37(1): 77–95.
- Omar M I , Chowdhury M M I, Tauhidul Islam M T , Islam M R and Islam M. 2014. Marketing efficiency and post harvest loss of flower in Bangladesh. *IOSR Journal of Business and Management* 16(1): 45–51.
- Raina V, Nain M S , Hansra B S and Singh D. 2011. Marketing behaviour and information sources utilization pattern of flower growers. *Journal of Community Mobilization and Sustainable Development* 6(2): 180–4.
- Sharma M, Rajesh T and Piyush M. 2014. Economic feasibility analysis of major flower crops in Himachal Pradesh state of India. *International Journal of Advanced Research in Management and Social Sciences* 3(9): 24–40.
- Shepherd Geoffrey S. 1972. *Marketing of Farm Products*, pp 24–7. Iowa State University Press, Ames, Iowa, USA.
- Siegel S and Castellan N J. 1988. *Nonparametric Statistics for the Behavioral Sciences*, 2nd Edn. McGraw-Hill international Edition, USA.
- Singh A K, Singh M K and Singh R R. 2013. The economics of marigold flowers in Eastern Uttar Pradesh. *Journal of Rural and Agricultural Research* 13(2): 75–8.
- Sudhagar S. 2013. Production and marketing of cut flower (rose and gerbera) in Hosur taluk. *International Journal of Business and Management Invention* 2(5): 15–5.
- Taj S, Muhammad Tariq Iqbal Khan, Mazher Abbas and Arshed Bashir. 2013. Price spread and marketing margins of cut rose in Punjab, Pakistan. *Pakistan Journal of Agricultural Research* 26(1): 16–23.