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## ECONOMIC FEASIBILITY ANALYSIS OF MAJOR FLOWER CROPS IN HIMACHAL PRADESH STATE OF INDIA

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**Abstract:** *This study explored economic feasibility analysis of major flower crops in the Himachal Pradesh State of India, using, net present value, benefit cost ratio and internal rate of return. Descriptive statistics were used for analyzing the problems and prospect of floriculture industry in the state. Variable cost for important flower crops such as carnation, gerbera, liliun, chrysanthemum and rose were estimated. It ranges between 2- 5 lakh/1,000 m<sup>2</sup> area. The Net Present Value (NPV) of different flower crops was positive and ranges between 30-44 lakhs. Benefit cost ratio (BCR) was estimated to be 2.37, 2.01, 1.89, 2.39 and 2.89 for carnation, gerbera, liliun, chrysanthemum and rose, respectively. Internal Rate of Return of all flowers was found to be high i.e. more than 70 per cent in case of every flower crop studied. Sensitivity analysis of different flower crops indicated that benefit cost ratio was more than unity and value of Internal Rate of Return was found to be more than 70 per cent which proves that investment in flower crops is financially feasible. Lack of training and technical know-how, problems related to post-harvest management of flower, non-availability of cold storage facilities, unavailability of local market, and high transportation cost were among problems faced by sample farmers.*

**Keywords:** *Benefit Cost Ratio, Net Present Value, Internal Rate of Return, Floriculture, Hi-Tech.*

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## **INTRODUCTION**

The state of Himachal Pradesh comprised of wide variations of topographical and agro-climatic conditions, which offers ample opportunities to the farming communities in selecting crop enterprises of their choices in different parts of the state, depending on their household and commercial needs (State Horticulture Board, 2014). In the last few decades the diversification of cropping systems has taken place in favour of flower and vegetable crops resulting, the state gaining name in the field of off-season flower & vegetable cultivation under protected conditions (Dept. of Horticulture, Naini University- Himachal, 2014). The climate of the state is quite congenial for the production of significant flowers i.e. carnation, rose, gerbera, liliun etc, which can fetch (be sold for) high prices in market especially during the off-season.

T.K. Bose, 1999 in his book 'floriculture & Landscaping' has mentioned that, commercial floriculture is an activity which has assumed same importance only in recent times. Liberalized economic policies of government and the development initiatives have encouraged large number of enterprises. Consequently Floriculture industry has been experiencing rapid growth necessitating the increasing demand for floriculture items, which need to be capitalized for the benefit of the farming community ( Mishra 2007 ).

Floriculture is fast growing commercial enterprise in the state of Himachal and has been identified as one of the emerging and potential enterprise by the researchers and planners of the state. Baldev 2010 had mentioned in his article in Business Standard "Himachal Pradesh floriculture industry set to bloom" that, floriculture is now emerging as a major activity in the hills of Himachal Pradesh. . K.Singh 2001 in his study "Economics of wild Marigold Production and Distillation in Himachal Pradesh" concluded that, the production of wild marigold is more profitable than other crops like maize, pulses, and wheat and oil seeds. Among the horticultural crops covering fruits, vegetables spices, medicinal and aromatic plants and the like, floriculture constitutes an important segment (Mishra 2007). Farmers and other entrepreneurs recognizing the potential of floriculture have resulted in commercial production of cut flowers in the state which has steadily picked up the use of technology such as polyhouses/greenhouses. Again, congenial climatic conditions of the state, increasing demands, expanding markets, remunerative price structures and lucrative farm income from floral-enterprises have attracted the attention of innovative farmers.



Floriculture has huge potential as flower enterprise in terms of returns and employment generation especially for the small farmers. It has lower overhead costs, smaller farmers production cost per flower is about Rs. 0.80 and Rs.2.10 for larger farmers (Selvaraj 2003). Notwithstanding the benefits and potential of floriculture in the state, little research has been conducted to assess the profitability of floriculture in the state. Additionally, there is requirement to study problems and prospects of floriculture industry in the state so that particular problem identification and measurement can be done for the industry growth can be enhanced.

The study therefore leads to find answers to the following questions:

- (i) Are major flowers produced by farmers in the state profitable?
- (ii) What are the problems of farmers in the floriculture industry?
- (iii) Are there any prospects of hi-tech floriculture in the state?

## **II. MATERIALS AND METHODS**

### **Study area**

Himachal Pradesh is endowed with different agro-climatic conditions ranging from sub-tropical to dry temperate zones. Its climate ranges from sub-tropical to sub-arctic cold with an annual rainfall of 350 millimeters to 3800 millimeters. Its temperatures vary from -25 C to 42 C. (Agriculture of Planning Commission 2014). It has premium potential for growing off season cut flowers, as well as bulbs and seed multiplication. Area under floricultural crops in the state has arisen to 914 ha during 2012-13 which has increased from only 25 ha in 1993-94. Ornamental crops grown according to maximum area are chrysanthemum, marigold, gladiolus, carnation, rose, potted plants, annuals, liliium, gerbera, daffodils, flower seeds and alstroemeria. (Dr. Y.S. University, 2014).

### **Sample selection**

The primary data were collected on specifically designed and pretested survey schedule through personal interview method. Two stage simple random sampling technique was for the selection of floriculturists. At the first stage the main flower growing districts of state were identified and three districts namely Sirmour, Kangra, Mandi were selected randomly. The list of floriculturists was prepared in consultation with the officers of the department of agriculture, horticulture and Institute of Himalayan Bioresource Technology (IHBT) Palampur. Finally, a sample of 150 floriculturists was selected randomly.



### **Analytical Tools and Techniques**

Descriptive statistics such as percentages and frequencies were used in the analysis of prospects of Hi-Tech floriculture and Problems in the industry. BCR, NPV and IRR were employed for the study of economic feasibility of the major flower crops.

### **Description of variables**

#### **Working capital**

This included the expenditures on the materials like planting material, plant protection, farm yard manure, organic and inorganic fertilizers, packing material, miscellaneous items and the expenditure on labour for accomplishing various production operations of different flower crops. In addition to this the expenditure are electricity charges, irrigation charges and transportation charges of produce at farmer's level were also included.

#### **Fixed capital investment**

The fixed capital investment included the expenditure on the land preparation, construction of polyhouse including drip/sprinkler irrigation along with accessories, water storage structure like water tanks, spray pumps and equipments.

#### **Total capital investment**

The total capital investment for different flower crops was estimated by using the formula:

Total capital investment = Fixed capital investment + Working capital

**Cost of cultivation:** Cost of cultivation of flower crops was worked out by taking into consideration the variable and fixed cost and accordingly the returns over variable and total cost have been estimated by using the expressions:

Total variable cost = Working capital + Interest on total working capital @ 10 % on ½ yearly basis.

Fixed cost (FC) = Depreciation on fixed assets @ 10% + interest on fixed capital investment @ 10%.

Total cost = Fixed cost + Variable cost

Gross Return (GR) = Total production x Price per unit

### **Empirical Models**

The financial analysis was done by adopting the approach used by Bentil and Bannor 2014. The financial models used are NPV, BC Ratio, IRR by considering the period of investment at 10 years and using the rate of discount at 10 per cent.



### Net Present Value (NPV)

Net present value is the present worth of the net benefits or cash flow stream (Gittinger, 1996). Mathematically, the Net Present Value is estimated as follows:

$$NPV = \sum_{t=1}^{t=n} \frac{B_t - C_t}{(1+i)^t}$$

Where  $B_t$  denotes Benefit (Cash inflow) in year  $t$ ,  $C_t$  denotes cost (Cash outflow) in year  $t$ ,  $n$  denotes investment lifespan,  $i$  denotes cost of capital and  $t$  denotes time measured in years.

If the calculated NPV is positive it implies the investment is viable, and where the NPV is equal to zero implies that the investment breaks even. The rule with NPV is to accept all mutually exclusive investments with a zero or greater NPV (Gittinger, 1982).

### Benefit cost ratio (BCR)

The discounted gross benefit divided by the discounted gross cost. The B/C ratio measures the social equity and economic efficiency of resource utilization from the stand point of the society. A decision of B/C ratio is to accept projects with a ratio above one that is  $B/C > 1$ . Its formula for estimation is as follows:

$$BCR = \frac{\sum_{t=1}^n \frac{B_t}{(1+i)^t}}{\sum_{t=1}^n \frac{C_t}{(1+i)^t}}$$

$B_t, C_t, n, t, i$  as defined for NPV

### Internal Rate of Return (IRR)

This is the discount rate that makes the NPV of an investment equal to zero, i.e.

$$NPV = \sum_{t=1}^{t=n} \frac{B_t - C_t}{(1+IRR)^t} = 0$$

Excel was used in estimating the IRR of the identified potential investments. To calculate the IRR using interpolation method, two discount rates are estimated; one that gives small positive NPV and another that gives small negative NPV. The rule of thumb is that, the difference between the two discount rates should not be more than 5%. The method of interpolation is employed using the formula expressed as:

$$IRR = LDR + D \left( \frac{NPV_{LDR}}{|NPV_{HDR}| + NPV_{LDR}} \right)$$



Where, LDR denotes lower discount rate, HDR denotes higher discount rate,  $NPV_{HDR}$  denotes NPV calculated using higher discount rate,  $NPV_{LDR}$  denotes NPV calculated using lower discount rate and D denotes difference between lower and higher discount rates ( $\leq 5\%$ )

The decision rule is to accept all independent projects having an Internal Rate of Return equal to or greater than the cost or opportunity cost of capital (Gittinger, 1982). Specifically, if the IRR is greater than the cost of capital it implies that the investment is viable, when it is equal to the cost of capital the project will break even and when smaller than the cost of capital the investment is not viable.

### Assumptions

1. 1USD= 60Rupees
2. Agricultural loan interest rate= 10%

## III. RESULTS & DISCUSSION

**Table 1: Cost of cultivation for the production of Carnation**

S.N.	Particulars	Expenditure (Rs)		Percent
1	Area (m <sup>2</sup> )	981.25	1000	
2	Seed	192222.22	195945.18	36.32
3	FYM/Compost	6011.11	6127.53	1.14
4	Fertilizers	13760	14026.50	2.6
5	Plant protection	13764.44	14031.03	2.6
6	Soil treatment	10888.88	11099.78	2.06
7	Human labour	90222.22	91969.64	17.05
8	Other Charges (electricity charges etc.)	6000	6116.20	1.13
9	Post harvest management	7388.88	7531.99	1.4
10	Total Working Capital	340257.77	346847.88	64.29
11	Interest on Working Capital	17012.89	17342.39	3.21
12	Total Variable Cost	357270.66	364190.27	67.5
13	Cost of poly house	825000	840764.33	
14	Farm Machinery and equipments	35834	35834	
15	Total Fixed Investment	860834	876598.33	
16	Depreciation on Fixed Asset	86083.4	87659.83	16.25
17	Interest on Fixed Investment	86083.4	87659.83	16.25
18	Total Fixed Cost	172166.8	175319.66	32.5
19	Total Cost	529437.46	539509.93	100
	Production and Gross Returns			
1	Total Production	267777.77	272894.55	
2	Price per unit	4.25	4.25	
3	Gross Return	1138055.55	1159801.84	
	Net Returns			
1	Returns over Variable Cost	780784.88	795611.56	
2	Returns over Total Cost	608618.08	620291.90	

Source: Author's own computation from field survey (2012)



The average cost of cultivation of carnation is presented in Table 1. The table showed that total cost of materials for production of carnation was estimated to be Rs. 5.39 lakh for 1000 sqm area. Working capital for carnation is Rs3.47lakh. Analysis of various components of the working capital showed that, seed was the major component which accounted for 36 per cent and human labour constituted about 17 per cent of total cost. Other material inputs used were fertilizers, manures and plant protection material. The cost of chemical fertilizers and plant protection material were found around 3 per cent each of total cost. The value of other components like soil treatment, post harvest management etc. was observed to be very low and both accounted for about 3 per cent of total cost. The average production of the carnation had estimated value of 2.7 lakh stick/1000 sqm area annually. Average price for carnation estimated about 4-6 rupee per stick.

Gross return in carnation was about Rs. 11 lakh. Net returns over total cost of production were estimated at Rs. 6.2 lakh while net returns over variable cost were about Rs. 7.9 lakh.

**Table 2 : Cost of cultivation for Gerbera production**

S.N.	Particulars	Expenditure (Rs.)		Percent
1	Area (m <sup>2</sup> )	933.33	1000	
2	Seed	182418.66	195448.57	34.11
3	FYM/Compost	11416.66	12232.14	2.13
4	Fertilizers	16666.66	17857.14	3.12
5	Plant protection	7166.66	7678.57	1.34
6	Soil treatment	6083.33	6517.86	1.14
7	Human labour	123333.33	132142.86	23.06
8	Other charges	8500	9107.14	1.59
9	Post harvest management	5166.66	5535.71	0.97
10	Total Working Capital	360752	386520	67.46
11	Interest on Working Capital	18037.6	19326	3.37
12	Total Variable Cost	378789.6	405846	70.83
13	Cost of poly house	746666.66	800000	
14	Farm Machinery and equipments	35645	35645	
15	Total Fixed Investment	782311.66	835645	
16	Depreciation on Fixed Asset	78231.17	83564.5	14.58
17	Interest on Fixed Investment	78231.17	83564.5	14.58
18	Total Fixed Cost	156462.34	167129	29.17
19	Total Cost	535251.94	572975	100
	Production and Gross Returns			
1	Total Production	280506.66	300542.85	
2	Price per unit	3.75	3.75	
3	Gross Return	1051900	1127035.71	
	Net Returns			
1	Returns over Variable Cost	673110.4	721189.71	
2	Returns over Total Cost	516648.06	554060.71	

Source: Author's own computation from field survey (2012)



Table 2 showed that total cost of materials for production of gerbera was Rs. 5.7 lakh/1000 sqm area per annum. Analysis of various components of the cost structure showed that, seed was the major component and accounted for 34 per cent of the total cost of cultivation. Human labour was other important component and it constituted about 23 per cent of total cost. The cost of chemical fertilizers was about 3 per cent of total cost, whereas the value of farmyard manure (FYM), plant protection, soil treatment was collectively around 4 per cent. The average total production of gerbera was estimated about 3 lakh sticks/1000 sqm area while price range per flower was 3-5 Rupees. Estimated gross return in gerbera was about Rs. 11 lakh and the return over variable cost and return over total cost of production were estimated at Rs. 7.21 lakh and 5.54 lakh respectively.

**Table 3: Cost of cultivation for Lilium production**

S.N.	Particulars	Expenditure (Rs)		Percent
1	Area (m <sup>2</sup> )	1200	1000	
2	Seed	472349.2	393624.33	53.48
3	FYM/Compost	9380	7816.66	1.06
4	Fertilizers	23670	19725	2.68
5	Plant protection	8644	7203.33	0.98
6	Soil treatment	5030	4191.66	0.57
7	Human labour	106000	88333.33	12
8	Other charges	6000	5000	0.68
9	Post harvest management	7070	5891.66	0.8
10	Total Working Capital	638143.2	531786	72.25
11	Interest on Working Capital	31907.16	26589.3	3.61
12	Total Variable Cost	670050.36	558375.3	75.86
13	Cost of poly house	1020000	850000	
14	Farm Machinery and equipments	38550	38550	
15	Total Fixed Investment	1058550	888550	
16	Depreciation on Fixed Asset	105855	88855	12.07
17	Interest on Fixed Investment	105855	88855	12.07
18	Total Fixed Cost	211710	177710	24.14
19	Total Cost	881760.36	736085.3	100
	Production and Gross Returns			
1	Total Production	43160	35966.66	
2	Price per unit	35.45	35.45	
3	Gross Return	1530022	1275018.33	
	Net Returns			
1	Returns over variable cost	859971.64	716643.03	
2	Returns over Total cost	648261.64	538933.03	

Source: Author's own computation from field survey (2012)

The table above shows that, the total cost of materials for production of lilium is estimated to be about Rs. 7 lakh for 1000 sqm area. Analysis of various components of the cost



structure showed that, seed was the major component and accounted for 52 per cent of the total cost of cultivation. The value of human labour was constituted about 12 per cent of total cost. The value of other components like soil treatment, plant protection, post harvest management etc. was observed to be very low and every component accounted for less than 1 per cent of total cost. The average total production of the liliun was estimated 35966 bunch/1000 sqm area while the price ranges was 32-40 rupee per bunch. Gross return in liliun was about Rs. 12 lakh/1000 sqm area. The return over variable cost and return over total cost were estimated at Rs. 7.16 lakh and Rs. 5.38 lakh, respectively.

**Table 4 : Cost of cultivation for Chrysanthemum production**

S.N.	Particulars	Expenditure (Rs)		Percent
1	Area (m <sup>2</sup> )	933	1000	
2	Seed	125000	133976.42	31.72
3	FYM/Compost	8000	8574.49	2.03
4	Fertilizers	13950	14951.77	3.54
5	Plant protection	8766.66	9396.21	2.22
6	Soil treatment	4116.66	4412.29	1.04
7	Human labour	55666.66	59664.17	14.13
8	Other charges	5000	5359.06	1.27
9	Post harvest management	6333.33	6788.14	1.61
10	Total Working Capital	226833.33	243122.54	57.56
11	Interest on Working Capital	11341.67	12156.13	2.88
12	Total Variable Cost	238175	255278.67	60.44
13	Cost of poly house	746400	800000	
14	Farm Machinery and equipments	35550	35550	
15	Total Fixed Investment	781950	835550	
16	Depreciation on Fixed Asset	78195	83555	19.78
17	Interest on Fixed Investment	78195	83555	19.78
18	Total Fixed Cost	156390	167110	39.56
19	Total Cost	394565	422388.67	100
	Production and Gross Returns			
1	Total Production	53466.66	57306.18	
2	Price per unit	15.85	15.85	
3	Gross Return	847446.66	908302.96	
	Net Returns			
1	Returns over Variable Cost	609271.66	653024.29	
2	Returns over Total Cost	452881.66	485914.29	

Source: Author's own computation from field survey (2012)

The table shows total cost of materials for production of chrysanthemum was estimated to be about Rs. 4.22 lakh for 1000 sqm area. Analysis of various components of the cost structure showed that seed component is an important component and accounted for major proportion i.e. 32 per cent of the total cost of cultivation. The value of human labor



constituted about 14 per cent of total cost. Other material inputs used were fertilizers, manures and plant protection material. The cost of chemical fertilizers and the value of FYM/compost accounted for 4 and 2 per cent of the total cost, respectively, whereas the value of plant protection accounted for 2 per cent of the total cost. The value of other component like post harvest management and other expenses like electricity charges, water charges etc. were observed to be very low and accounted for almost 1 per cent of total cost. The average total production of the chrysanthemum was estimated about 57,306 bunches/1000 sqm area. Gross return in Chrysanthemum was about Rs. 9.08 lakh. The return over variable cost and return over total cost of production were estimated at Rs. 6.53 lakh and 4.85 lakh, respectively.

**Table 5: Cost of cultivation for the production of Rose**

S.No.	Particulars	Expenditure (Rs.)		Percent
1	Area (m <sup>2</sup> )	650	1000	
2	Seed	93600	144000	32.28
3	FYM/Compost	2725	4192.30	0.94
4	Fertilizers	8750	13461.54	3.02
5	Plant protection	4600	7076.92	1.59
6	Soil treatment	4250	6538.46	1.47
7	Human labour	45000	69230.77	15.52
8	Other charges	4500	6923.07	1.55
9	Post harvest management	9250	14230.77	3.19
10	Total Working Capital	172675	265653.9	59.55
11	Interest on Working Capital	8633.75	13282.69	2.98
12	Total Variable Cost	181308.8	278936.5	62.53
13	Cost of poly house	520000	800000	
14	Farm Machinery and equipments	35850	35850	
15	Total Fixed Investment	555850	835850	
16	Depreciation on Fixed Asset	55585	83585	18.74
17	Interest on Fixed Investment	55585	83585	18.74
18	Total Fixed Cost	111170	167170	37.47
19	Total Cost	292478.8	446106.5	100
	Production and Gross Returns			
1	Total Production	111041.5	170833.1	
2	Price per unit	6.85	6.85	
3	Gross Return	760634.3	1170207	
	Net Returns			
1	Returns over Variable Cost	579325.5	891270	
2	Returns over total Cost	468155.5	724100	

Source: Author's own computation from field survey (2012)

The table shows that total cost of materials for production of rose was estimated to be about Rs. 4.5 lakh for 1000 sqm area. Analysis of various components showed that seed was



the major component and accounted for 32 per cent of the total cost while other major component i.e. human labour was constituted about 16 per cent of total cost. The material inputs used were fertilizers, manures and plant protection material. The value of fertilizers and plant protection measures accounted for 3 per cent and 2 per cent of total cost, respectively. From the analysis it was observed that the use of fertilizer was more than recommended dose. The value of other post management related operations was accounted for 3 per cent of the total cost. In the study area the average total production of the rose was estimated about 1.7 lakh sticks/1000 sqm area in one year while price range was 5- 8 rupee per stick.

Gross return has also been worked out and it can be seen from the table that gross return in Rose was about Rs. 11 lakh. The return over variable cost and return over total cost were estimated at Rs. 8.91 lakh and Rs. 7.24 lakh, respectively.

**Table 6: Financial feasibility of significant flower crops**

S.N.	Name of Crop	Financial indicators		
		BC Ratio at 10%	NPV at 10%	IRR at 10%
1.	Carantion	2.37	4041287.98	92.5%
2.	Gerbera	2.01	3033595.59	79.2%
3.	Lilium	1.89	4421659.14	84.1%
4.	Chrysanthemum	2.39	3031450.24	79.1%
5.	Rose	2.89	3056905.22	105.7%

*Source: Author's own computation from field survey (2012)*

#### **Benefit Cost Ratio (BCR)**

BC Ratio of selected flower crops i.e. carnation, gerbera, lilium, chrysanthemum and rose was calculated and it was found maximum in case of rose (2.89). It indicates that rose is more profitable enterprise than other flower crops.

#### **Net Present Value (NPV)**

Net present worth of an investment is the difference between the present value of series of inflows (returns) and outflows (costs) over the economic life period of different flower crops. It was observed that NPV was positive in all the flower enterprises. It ranges between Rs. 30 – 44 lakhs for different flower crops and was observed to be highest in lilium (44 lakh) followed by carnation (40 lakh).

#### **Internal Rate of Return (IRR)**

This criterion measures the rate of return that can be realized by reinvestment of the returns in flower crops. Hence, the IRR indicates an important basis of investment and



scores over other criterion of evaluation, which does not consider the reinvestment opportunities. IRR was highest in rose (106 %) followed by carnation (93%).

**Table 7: Sensitivity analysis of significant flowers**

S.N.	Name of Crop	Financial indicators								
		NPV at 10%			BC Ratio at 10%			IRR at 10%		
		5 %	10 %	15 %	5 %	10 %	15 %	5 %	10 %	15 %
1.	Carnation									
i)	Increase in Cost	3936751.14	3832214.30	3727677.5	2.29	2.21	2.14	90.55	88.56	86.57
ii)	Decrease in Returns	3691645.04	3342002.10	2992359.2	2.25	2.13	2.01	85.89	79.22	72.53
2	Gerbera									
i)	Increase in Cost	2922762.34	2811929.10	2701095.9	1.94	1.87	1.81	76.81	74.48	72.14
ii)	Decrease in Returns	2731966.98	2430338.37	2128709.8	1.91	1.81	1.71	72.80	66.42	60.00
3	Lilium									
i)	Increase in Cost	4225603.45	4029547.76	3833492.1	1.8	1.7	1.6	81.02	77.98	74.93
ii)	Decrease in Returns	3951592.99	3481526.85	3011460.7	1.8	1.7	1.6	76.76	69.44	62.07
4	Chrysanthemum									
i)	Increase in Cost	2961760.64	2892071.01	2822381.4	2.32	2.25	2.18	77.66	76.20	74.73
ii)	Decrease in Returns	2771090.62	2510730.98	2250371.3	2.27	2.15	2.03	73.65	68.15	62.62
5	Rose									
i)	Increase in Cost	3003854.56	2950803.90	2897753.3	2.8	2.71	2.63	104.1	102.5	101.0
ii)	Decrease in Returns	2823216.80	2589528.38	2355840	2.75	2.6	2.46	98.83	91.95	85.06

Source: Author's own computation from field survey (2012)

In sensitivity analysis working capital was increased by 15 per cent and it was estimated under two situations.

1. Gross returns were reduced by 10 and 15 per cent.
2. Cost was increased by 10 and 15 per cent of working capital.

Sensitivity analysis indicated that in every situation benefit cost ratio was more than unity and value of IRR was more than 60 per cent which showed that investment in each flower crop is feasible.

### Problems and prospects of Hi-Tech Floriculture

Various innovative farmers are adopting hi- tech. floriculture practices as commercial activity and they are also getting higher returns from their produce. Besides getting the higher outcomes, farmers are also facing some production and marketing related problems. O.P. Sehgl (1998) in his study observed that lack of technical persons, poor handling of



flowers and marketing are the major bottlenecks in the carnation industry of H.P. Various problems faced by the respondents of the study area and their view regarding future prospects of floriculture on different aspects were studied and are discussed in present section.

**Table 8: Problems related to production of flowers faced by the sampled respondents**

S.N.	Particulars	Response	
		Number	Percent
1.	Non availability of seeds/planting material of improved	75	50
2.	Costly inputs	54	36
3.	Low quality inputs	18	12
4.	Lack of technical know-how and training	54	36
6.	Proper design of greenhouse structure	9	6

*Source: Author's own computation from field survey (2012)*

It was found that non-availability of the quality planting material i.e. seeds/cuttings/bulbs/corms etc. was the major problem faced by 50 per cent of the sampled floriculturists. Sampled respondents (36 per cent) were also facing the problem of lack of training and technical know how. It was found that technical specification of polyhouses was not any major problem.

**Table 9: Problems related to post harvest management faced by sampled respondents**

S.N.	Particulars	Response	
		Number	Percent
1.	Lack of knowledge about appropriate stage of harvesting	42	28
2.	Non-availability of grading facilities	42	28
3.	Packing material is costly /not available in time	30	20
4.	Cold storage facilities are not available in the local area	90	60
5.	Cold storage is costly	87	58

*Source: Author's own computation from field survey (2012)*

The problems of post- harvest management mainly arise on account of perishable nature of produce. The problems related to postharvest management of flowers have been analyzed and are presented in Table 9. It was observed that in the nearby areas non-availability of cold storage facilities was reported to be the major problem which was being faced by the 60 per cent of the sampled respondents. It was also reported by the 58 per cent sampled respondents that the cost of cold storage in the market is quite high.



**Table 10: Problems related to marketing faced by the sampled respondents**

S.N.	Particulars	Response	
		Number	Percent
1.	Prevalence of low prices in local and distant market	45	30
2.	Lack of regulated markets	45	30
3.	Flower markets are at distant place	96	64
4.	High transportation cost to distant market	87	58
5.	Lack of adequate market information	45	30
6.	Lack of link roads	30	20
7.	Delayed payment by traders	45	30
8.	Malpractices by traders	39	26

*Source: Author's own computation from field survey (2012)*

Farmers sold their flowers in the local or distant market depending upon the demand and price of the produce. The market prices found to fluctuate widely depending upon demand and supply in the market. It was very important for the farmers to have appropriate and updated market information from various sources about the price of the produce to be sold in market. Beside these factors, farmers were also facing other marketing problems like, distant market (64), high transportation cost (58 per cent), lack of regulated market (30 per cent) etc. (Table 10). The problems of delayed payment and malpractices in the market by the traders were also reported by 30 and 26 per cent of the respondents, respectively.

**Table 11: Opinions of the sampled respondents regarding future prospects of floriculture**

S.N.	Prospects	Response	
		Number	Percent
1.	Input availability is being improved through the private enterprise	84	56
2.	Development of new varieties by research institutes	72	48
3.	High Productivity	75	50
4.	Demand of floriculture enterprise is increasing	66	44
5.	Improvement in income level of people	87	58
6.	Flowers are relatively profitable	90	60
7.	Increasing price trend of floriculture enterprises	60	40
8.	Government policies and incentives	99	66

*Source: Author's own computation from field survey (2012)*

Floriculture has gained a great deal of commercialization on account of increasing demand in main cities in recent past. The enterprise is also becoming popular among the farming communities due to the availabilities of flower production technologies as well as through the incentives of the government. Varieties of flowers in the form of loose flowers, cut flowers, pot and other ornamental plants can be grown under polyhouses and open conditions of the state. Dahiya (1997) had also concluded that, the prospects for development of crops such as fruits, floriculture, mushrooms are very bright since the state



has several innate agro-climatic advantages. The views of the sampled floriculturists regarding the future prospects of floriculture on different aspects were taken and have been compiled in Table 11.

Majority of the sampled respondents i.e. 66 per cent felt that the government is providing large number of incentives for the promotion of the enterprise. It was also indicated by 60 per cent of the sampled respondents that, floriculture was a profitable activity when compared with other farm enterprises. About 58 per cent of the sampled respondents were of the view that the demand of the flowers in the market is showing an increasing trend due to the improvement in income level of the people. Similarly, about 56 per cent of sampled respondents indicated that the private sector is coming forward to meet the growing demand of the farmers with respect to critical inputs and infra-structure related to construction of polyhouses.

## **CONCLUSIONS AND RECOMMENDATIONS**

Variable cost for important flower crops like carnation, gerbera, liliium, chrysanthemum and rose was estimated. It ranges between 2- 5 lakh/1,000 m<sup>2</sup> area. It was found highest in liliium followed by gerbera, carnation, rose and chrysanthemum. Seed and human labour were the major constituents among different cost of working capital. Fixed investment was made for construction of polyhouses, irrigation structure and it was estimated about 8 lakh/1,000 m<sup>2</sup> area. Similarly, gross returns were also calculated and these were found highest in liliium.

Net Present Value (NPV) of different flower crops was positive and ranges between 30-44 lakhs. Benefit cost ratio (BCR) was estimated to be 2.37, 2.01, 1.89, 2.39 and 2.89 for carnation, gerbera, liliium, chrysanthemum and rose, respectively. IRR of all flowers was found to be encouraging and it was quite high i.e. more than 70 per cent in case of every flower crop which indicated the higher rate of return from flowers. Sensitivity analysis of different flower crops indicated that benefit cost ratio was more than unity and value of IRR was found to be more than 70 per cent which proves that investment in flower crops is financially feasible.

Sampled floriculturists were facing various production problems it was found that non-availability of the quality planting material i.e. seeds/cuttings/bulbs/corms etc. was the major problem faced by 50 per cent of the sampled floriculturists. Sampled respondents (35 per cent) were also facing the problem of lack of training and technical know- how. It was



found that technical specification of polyhouses was not any major problem. In addition to problems related to production, sampled respondents were also facing problems related to post-harvest management of flowers. It was observed that in the nearby areas non-availability of cold storage facilities was reported to be the major problem which was being faced by the 65 per cent of the sampled respondents. It was also reported by the 60 per cent sampled respondents that the cost of cold storage in the market is quite high. Farmers were also facing marketing problems like lack of organized market (30 per cent), unavailability of local market (65 per cent) and high transportation cost (60 per cent). In addition to this, sampled farmers (20 per cent) from rural areas were suffering the problems to carry their produce to distant markets, due to lack of network of link roads.

It was revealed that floriculture enterprise has bright future prospects and it would be helpful in improving the socio-economic status of the farming community. The view of the sampled floriculturists regarding the future prospects of floriculture was taken and majority of the respondents (65 per cent) felt that the government is providing large number of incentives for the promotion of the enterprise. This study lends credence to the fact that potential for flower crop production in Himachal Pradesh is quite high. Present study however, has significant implication for farming community to adopt flori products as their source of employment with protected cultivation i.e. hi-tech floriculture. Government has also to step the focus on cold storage facilities in area, wider dissemination of scientific & technical information, to farmers through regular training programs & seminars.

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