

Floriculture and the Role of Women in Nagaland : A Case Study

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Abstract

Cultivation of flowers in Nagaland has been in practice since time immemorial, and production and marketing of cut flowers was confined to a small area. However, since 2004-05, under the active support of Horticulture Mission for North-Eastern and Himalayan states (HMNEH), more area was brought under floriculture for commercial purposes. Increase in the domestic demand for fresh-cut flowers and support from the state government is encouraging more women to take up flower cultivation on a commercial basis. The district of Kohima was selected for the present study. This study was done on primary data collected from 100 flower growers interviewed using a pre-tested questionnaire. Simple tabulation and regression model was used to analyze the data collected. With the commercialization of floriculture products, the floriculture sector has now become one of the fastest growing segments of horticulture, opening ways for Naga women and unemployed female youths to earn a living by engaging themselves in activities which were earlier a mere hobby for them, pushing the economy towards development. The flower industry in Nagaland, being a fresh industry, is facing many challenges and shortcomings. Thus, efforts have been made to study the extent of women empowerment through floriculture, employment opportunities, income generation, and challenges associated with it.

Keywords : floriculture, employment, and women empowerment

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Women are the backbone of the Indian agricultural workforce who are neglected most of the time. Various programmes have been introduced through Indian Council of Agricultural Research (ICAR), National Centre for Women in Agriculture, and Krishi Vigyan Kendras (KVKs) to promote women in the field of agriculture, animal husbandry, and homestead technologies. An important factor of empowerment in the third World Countries constitute rural women, who play a crucial role in all spheres of developmental activities (ICAR Annual Report, 2003-04). Employment of women in the cut-flower industry has brought about some improvement in their income and their decision making within their family and outside in the Ecaudor (Korovkin, 2003). Since women form almost half of the global population, sustainable development is inevitable without empowering women. Women can play a major role in sustainable development through dialogue on economic, social, cultural, and environmental issues (Ebrahimi-far, 2007).

Women empowerment in Nagaland has been carried out through the introduction of various programmes and initiation of self help groups in different parts of the state by giving them trainings and financial assistance to promote their socioeconomic conditions. One such programme is the commercialization of floriculture in

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Nagaland during 2004-05 under the Horticulture Mission for North-Eastern and Himalayan States (HMNEH), which is empowering women by creating employment opportunities to earn their livelihood.

Flowers in Nagaland have been used as an ornament to beautify houses since time immemorial and planting of flowering plants was mainly carried out by women because of greater participation of men in the service sector and other allied activities, and it is also regarded as a feminine activity. Flower marketing was also practised in the state before the inception of this mission, which was, however, in small proportion and not common with the locals. It was through the technology mission that women in Nagaland started producing high-quality flowers of international standard using advanced technology along with high-quality inputs like planting materials, green house, drip irrigation system, feeds, and fertilizers. Thus, the floriculture industry was reinvigorated through HMNEH. Based on the climatic conditions, easy accessibility and proximity to the market, the state Horticulture Department selected four districts namely Dimapur, Kohima, Mokokchung, and Wokha for commercial cultivation of flowers.

For the purpose of this study, the district of Kohima was selected keeping in view the highest area under cut flower cultivation in Nagaland, increasing participation of women, and rising demand for cut flowers. The study has been carried out with these objectives in mind:

- (i) To study the extent of women empowerment through employment in floriculture production and marketing.
- (ii) To bring out the various issues and challenges faced by Naga women in the floriculture industry.

Review of Literature

The aesthetic value of flowers and ornamental plants, their use in social events, personal satisfaction gained, and high income generated from them is attracting modern entrepreneurs to the floriculture industry (Sudhagar, 2013). Khan (2005) stated that the introduction of floriculture crops enables farmers to earn more income by exploiting the available natural resources more efficiently. Net profit against the investment is much higher from these crops compared to other conventional crops. According to Baris and Uslu (2009), the cut flower industry not only provides employment and earns net returns, but also contributes to fertilizers, agriculture, and transportation industries. Different kinds of cut flowers with high market value and marketing techniques should be introduced to producers and exporters. Introduction of professionals is necessary in production, marketing, and training activities to fill the gap of technical knowledge. Mou (2012) reported that flower farming can improve farmers' socioeconomic condition, increase self-employment, promote entrepreneurship, remove poverty, and promote growth in the economy.

Establishment of a research wing can develop better methods of flower cultivation which can reduce cost, increase the income of growers, and provide valuable information to the producers of flowers to improve quality, and reduce wastage during harvesting. At the same time, diversion of surplus labour into different activities of flower business and the need to boost export of cut flowers in Pakistan is required (Manzoor, Shahid & Baluch, 2001). With globalization, increased participation of Moroccan women in every field of occupation has been witnessed and there has been more percentage of women at university level as well. Impetus, independence, and strategies were found to be the reason for the Moroccan women for taking up entrepreneurial activity (Gray & Finley-Hervey, 2005).

Noguera, Alvarez, and Urbano (2013) studied the socio-cultural factors influencing female entrepreneurship in Catalonia. They used logistic regression models and the analysis showed that fear of failure and perceived capabilities had a significant impact on the probability of being a female entrepreneur ; whereas, perceived opportunities and role models did not have a significant impact.

Methodology

The study was conducted with primary data which was collected during the year 2013-14. All together, 100 flower growers were selected through stratified random sampling method and pre-tested questionnaire was used for the collection of primary data. Three cut flowers namely, Alstroemeria, Lilium, and Rose were selected for the study. Of the total respondents, 28 cultivators were growing only Alstroemeria, 23 cultivators were growing only Lilium, 18 cultivated only Rose, 12 cultivated both Alstroemeria and Lilium, four cultivated both Alstroemeria and Rose, seven cultivated both Rose and Lilium, and eight cultivated all the three selected cut flowers, that is, Alstroemeria, Lilium, and Rose. Regression model has been used to analyze the relationship between the variables and the output.

Multiple Regression

$$Y_i = \sum_{i=0}^k \beta_i X_{it} + \mu_i$$

where,

Y_i is the dependent variable, the X 's are the independent variables, and μ_i is the error term. β_i is the constant term, or intercept of the equation.

Y = Revenue measured in ₹; X_1 = Age measured in years; X_2 = Education measured in years; X_3 = Land holding measured in acre; X_4 = Capital cost measured in ₹; X_5 = Labour cost measured in ₹; X_6 = Productivity measured in stem; X_7 = Average price measured in ₹.

Results and Discussion

On the basis of the objectives cited, this section has been divided into five sections, section one brings out the employment opportunities available in the floriculture industry, section two emphasizes on income generation, section three explains the decision making ability of the growers, and section four explains the problems faced by the growers.

(1) Employment Opportunities Through Floriculture : Floricultural crops are highly labour intensive and have the capacity to generate more direct and indirect employment in rural areas as well as in urban areas. Estimates across different states in India indicate that the employment generation of flower crops cultivation was higher than other horticultural crops, food crops, and commercial crops (Thippaiah, 2005). Since the inception of commercial floriculture in Nagaland, participation of women in the field of flower production and marketing has been increasing continuously. Increased participation of women in floriculture is empowering them and at the same time, is generating more employment opportunities for the daily wage earners and full time workers. Since flower growers are mostly married women and some are employed in service sector or other entrepreneurial activities, they usually hire labourers to carry out floricultural activities. The extent of employment generation by flower growers varies depending on the area and type of flowers under cultivation, amount of production, and the occupation of the growers.

(i) Alstroemeria : Employment generation during the first and second year of Alstroemeria [1] cultivation is shown in the Table 1. It is indicative from the Table that more males are hired in those activities that require more physical effort except in transportation, loading, and unloading, where more females are employed. During the

first year of cultivation, that is, when the process of cultivation starts, from ploughing the land to preparation of the flower bed, manuring, planting, etc., a total of 75.38 man-days labour is absorbed for a polyhouse measuring 200m². Highest number of labour is absorbed in watering the plants, which is a regular activity and comprises of 30.29% of the total labour, that is, 22.83 man-days. The highest number of females are hired labour, that is, 11.06 man-days are absorbed in this activity. Followed by ploughing the land, where a total of 13.66 man-days labour (18.12%) is employed, of which hired male labour comprises of 11 man-days and hired female labour only 0.58 man-days, indicating less female labor absorption in heavy manual work. Only 0.12 man-days labour (0.16%) is employed in controlling pests and diseases [2]. There is less male family member participation in most of the activities and no participation in pest and disease control, watering, weeding, trimming, and harvesting. In the complete process of cultivation, female family members form the major labour employed with 38.19% (28.79 man-days) followed by male hired labour (31.29%) and female hired labour (25.46%). Only 5.05% (3.81 man-days) male family labour is employed during the first year of cultivation.

During the second year of cultivation, the number of employment generation is reduced to 49.04 man-days. Apart from ploughing, flower bed preparation and planting, other activities continue. Since during the second year, no heavy manual work is carried out, more female hired labour is employed than male hired labour. The number of hired male labour is 6.75 man-days comprising of 13.76% of the total employment and female hired labour is 16.28 man-days (33.19%). Female family labour makes up 48.84% (23.95 man-days) of the total employment and male family labour forms only 4.20% (2.06 man-days). The higher employment of female - both family and hired labour - exemplifies women empowerment.

Table 1. Employment Generation During the First and Second Year of Alstroemeria Cultivation (Area 200m²).

Labour activities	Labour absorption in first year (labour man-days)					Labour absorption in second year (labour man-days)				
	Hired		Family		Total	Hired		Family		Total
	M	F	M	F		M	F	M	F	
Ploughing	11.00	0.58	0.80	1.28	13.66 (18.1)	-	-	-	-	-
Flower bed preparation	3.67	0.44	0.47	0.92	5.50 (7.30)	-	-	-	-	-
Manuring	2.75	0.83	0.41	1.28	5.27 (7.0)	1.10	0.33	0.16	0.51	2.10 (4.3)
Planting	0.53	1.36	0.22	1.86	3.97 (5.3)	-	-	-	-	-
Pest and disease control	0.05	-	-	0.07	0.12 (0.1)	0.05	-	-	0.07	0.12 (0.2)
Watering	2.14	11.06	-	9.63	22.83 (30.3)	2.14	11.06	-	9.63	22.83 (46.5)
Weeding and trimming	0.90	2.89	-	4.20	7.99 (10.6)	0.90	2.89	-	4.20	7.99 (16.3)
Harvesting	0.24	1.71	-	4.40	6.35 (8.4)	0.24	1.71	-	4.40	6.35 (12.9)
Transport load and unload	2.32	0.29	1.90	5.14	9.65 (12.8)	2.32	0.29	1.90	5.14	9.65 (19.7)
Total	23.59 (31.3)	19.19 (25.5)	3.81 (5.0)	28.8 (38.2)	75.38 (100)	6.75 (13.7)	16.28 (33.2)	2.06 (4.20)	23.95 (48.8)	49.04 (100)

Source: Field survey 2013-14

Note: Figures in parentheses are percentage of the total.

[1] Gestation period of alstroemeria is 3 to 4 months and has a life span of 3 to 5 years.

[2] Availability of good natural manure in the form of humus, vermi compost, and animal excreta acts as an alternative to the use of chemicals to speed up the growth process and thus maintain its quality that prevents the use of chemicals to control pests and diseases.

Table 2. Employment Generation During the First and Second Year of Lilium Cultivation (Area 200m²)

Labour activities	Labour absorption in first year (labour man-days)					Labour absorption in second year (labour man-days)				
	Hired		Family		Total	Hired		Family		Total
	M	F	M	F		M	F	M	F	
Ploughing	11.15	0.22	0.62	1.05	13.04 (18.50)	-	-	-	-	-
Flower bed preparation	4.77	0.27	0.52	0.62	6.18 (8.77)	-	-	-	-	-
Manuring	2.67	0.60	0.40	1.35	5.02 (7.12)	1.33	0.30	0.20	0.67	2.50 (5.15)
Planting	0.31	1.20	0.14	2.52	4.14 (5.87)	0.31	1.20	0.14	2.52	4.14 (8.53)
Pest and disease control	0.08	-	-	0.06	0.14 (0.20)	0.08	-	-	0.06	0.14 (0.29)
Watering	3.53	9.31	-	9.31	22.15 (31.43)	3.53	9.31	-	9.31	22.15 (45.64)
Weeding and trimming	0.85	2.39	-	3.03	6.27 (8.90)	0.85	2.39	-	3.03	6.27 (12.92)
Harvesting	0.47	1.29	-	3.63	5.39 (7.65)	0.47	1.29	-	3.63	5.39 (11.11)
Transport load and unload	1.65	0.21	1.57	4.48	7.91 (11.22)	1.65	0.21	1.57	4.48	7.91 (16.29)
Total	25.49 (36.17)	15.50 (21.99)	3.52 (4.99)	25.96 (36.84)	70.47 (100)	8.22 (16.94)	14.70 (30.29)	1.91 (3.93)	23.70 (48.83)	48.53 (100)

Source: Field survey 2013-14. Note: Figures in parentheses are percentages of the total.

(ii) Lilium : From the Table 2, Lilium [3] crop, during its first year of cultivation, employed 70.47 man-days of labour. Watering the plant absorbs the highest labour, with 22.15 man-days constituting 31.43% of total employment. Equal amount of female labour - both hired and family - is employed in watering with 9.31 man-days each ; 13.04 man-days have been employed for ploughing, where male hired labour constitutes the major employment of 11.15 man-days. Only 0.14 man-days (0.20%) have been absorbed in controlling pests and diseases for which male hired labour is 0.08 man-days and female family labour covers the remaining 0.06 man-days. Employment of male hired labour decreases along the activities that require less physical effort and more female labour is hired for such activities. It is evident from the Table 2 that participation of male family labour is very meager, with just 3.52 man-days labour and there is no male family labour engaged in controlling pests and diseases, watering, harvesting, weeding, and trimming. More males are hired in the first year of cultivation, that is, 25.49 man-days forming 36.17% of total employment, female hired labour form 21.99%, male family labour 4.99%, and female family labour 36.84%.

While the other two selected cut flower are perennial plants having a life span of more than a year, Lilium bulb is a seasonal plant which produces flower once and has to be replaced or replanted with new bulb. Sometimes, the same bulb can be used for second production depending on the quality of the bulb. Thus, planting takes place in the second and third season as well and so does manuring the soil where new manure is added to the old soil. In the second year, labour absorption is reduced to 48.53 man-days of which 45.64% of labour is employed in watering ; 16.29% in transportation, loading, and unloading ; 12.92% in weeding and trimming ; 11.11% in harvesting ; 8.53% in planting ; 5.15% in manuring ; and only 0.29% in controlling pests and diseases. There is more participation of female family and hired labour with 48.83% and 14.70% of the total employment, respectively.

(iii) Rose : The Table 3 shows the classification of labour under different activities for producing Rose [4] cut

[3] Lilium is a seasonal plant having a gestation period of 2 to 3 months. Employment generation for planting Lilium has been taken only one time, it can be planted more than once in a year depending on the ability or willingness of the growers.

[4] Rose being a perennial plant has a life span of 5 to 6 years and a gestation period of 6 months.

Table 3. Employment Generation During the First and Second Year of Rose Cultivation (Area 200m²)

Labour activities	Labour absorption in first year (labour man-days)					Labour absorption in second year (labour man-days)				
	Hired		Family		Total	Hired		Family		Total
	M	F	M	F		M	F	M	F	
Ploughing	11.92	0.17	0.62	1.29	14 (18.74)	-	-	-	-	-
Flower bed preparation	3.92	-	0.21	0.62	4.75 (6.36)	-	-	-	-	-
Manuring	3.42	0.58	0.42	1.29	5.71 (7.64)	1.37	0.23	0.17	0.52	2.29 (4.74)
Planting	0.54	1.33	0.25	2.04	4.16 (5.57)	-	-	-	-	-
Pest and disease control	1.00	0.10	0.28	0.52	1.9 (2.54)	1.00	0.10	0.28	0.52	1.90 (3.93)
Watering	2.14	10.16	-	11.19	23.49 (31.44)	2.14	10.16	-	11.19	23.49 (48.59)
Weeding and trimming	0.21	2.99	-	3.72	6.92 (9.26)	0.21	2.99	-	3.72	6.92 (14.31)
Harvesting	-	1.56	-	4.40	5.96 (7.80)	-	1.56	-	4.40	5.96 (12.33)
Transport load and unload	1.99	0.14	1.99	3.66	7.78 (10.41)	1.99	0.14	1.99	3.66	7.78 (16.09)
Total	25.14 (33.65)	17.05 (23.01)	3.77 (5.05)	28.75 (38.48)	74.71 (100)	6.71 (13.88)	15.18 (31.40)	2.44 (5.05)	24.01 (49.67)	48.34 (100)

Source: Field survey 2013-14

Note: Figures in parentheses are percentages of the total.

flower. In the first year, 74.71 man-days labour is employed to produce Rose. Like the other two selected flowers, watering the flowers uses the highest amount of labour with 23.49 man-days (31.44%) followed by ploughing the land with 14 man-days (18.74%) labour ; and transportation, loading, and unloading 7.78 man-days labour (10.41%). Male hired labour has been employed in almost all the activities except in harvesting. Of the total employment, male and female hired labour form 33.65% and 23.01%, respectively, while participation of male family labour is stunted, comprising only 5.05% Female family labour constitutes 38.48%, representing majority of the employment. It is apparent from the Table 3 that female family labour is employed in all the activities from ploughing to post harvest management and transporting to the market for sale. However, employment of male family labour is absent in watering, weeding, trimming, and harvesting.

In the second year of production, employment generation decreases to 48.34 man-days and since Rose is a perennial plant, ploughing, flower bed preparation, and planting is not repeated. Even in the second year, female family members form the majority share in employment with 49.67% ; whereas, male family labour forms only 5.05%. More females (31.40%) were hired in the second year than males (13.88%) to carry out those activities which require extensive care.

It is clear from Tables 1, 2, and 3 that floriculture industry has better prospects of employment for the women in Nagaland. Production of *Alstroemeria* is more than that of the other two selected flowers and it employs more labour for harvesting, weeding, trimming, and transporting to the market. Thus, *Alstroemeria* generated more employment with 75.38 man-days in the first year, 49.04 man-days in the second year ; whereas, *Lilium* generated 70.47 man-days and 48.53 man-days in the first and second year, respectively. Rose generated employment of 74.71 man-days and 48.34 man-days in the first and second year, respectively.

(2) Income Generation and Women Empowerment : Production of flowers is a profitable business where its yield is double the cost of production and with the growing demand for cut flowers in the domestic as well as international markets, efforts should be made by the government and private entrepreneurs to develop the floriculture industry on scientific lines (Jahan, 2009).

Awareness about the use of fresh flowers and potted plants and increase in their demand, especially during

Table 4. Average Total Production, Marketed Quantity, Price per Stem, Average Total Cost, and Average Total Income Generated from the Selected Cut Flowers from an Area Measuring 200m²

Sl. No.	Particulars	Alstroemeria	Lilium	Rose
1.	Total Production (stems)	14122.90	7571.36	12314.17
2.	Productivity (no. of stems)	70.61	37.86	61.57
3.	Marketed quantity (number of stems)	12611.46	6995.46	11299.98
4.	Price/stem (₹)	8.89	17.60	9.19
5.	Total revenue (₹)	112115.88	123120.10	103846.82
6.	Total cost (₹)	29105.12	33033.07	40954.33
7.	Profit/loss (R-C)	83010.76	90087.03	62892.49

Source: Field survey 2013-14

Table 5. Factors that Determine Cut Flower Production in Kohima - Regression Analysis

Sl. No.	Variables	Alstroemeria	Lilium	Rose
1.	Constant	0.812	0.562	1.373
2.	Age (years)	0.067 (0.29)	0.151 (0.68)	-0.648 (1.64)
3.	Education (years)	0.038 (0.50)	-0.019 (0.32)	0.657 (3.33)*
4.	Land (acres)	0.078 (1.27)	0.019 (0.10)	0.077 (1.08)
5.	Capital cost (₹)	0.667 (5.56)*	0.536 (3.91)*	0.833 (4.39)*
6.	Labour cost (₹)	0.013 (0.17)	0.013 (0.17)	0.290 (2.63)*
7.	Productivity (number of stems)	0.387 (2.48)**	0.121 (0.72)	0.017 (0.098)
8.	Price (₹)	0.711 (1.96)***	1.451 (2.48)*	0.603 (0.84)
	R²	0.637	0.400	0.618
	F Change	13.173	4.001	6.70
	No. of observation	52	50	37

Note: Figures in parenthesis indicate *t*-values.

*, **, *** indicates 1%, 5%, and 10 % level of significance.

winter season, has created more avenues to increase production for commercial purposes. Increase in income, improvement in the standard of living, and the use of fresh flowers on every occasion has created more demand for flowers. Flowers grown under controlled conditions or poly-houses tend to fetch higher income than those grown in open spaces, the reason being flower cultivation under poly-houses is protected from pests and diseases, rain, direct sunlight, wind etc., and is thus able to produce high quality flowers. Depending on the demand and supply conditions for cut flowers, income generation differs in different seasons. Demand for fresh flowers is irregular, which keeps on fluctuating, so does their prices and production.

The average production, productivity, marketed quantity, price, revenue, cost, and profit margin of the selected cut flowers in an area measuring 200m² is indicated in the Table 4. Production and productivity of Alstroemeria (Table 4) is higher than that of Lilium and Rose. Average total cost of production of Alstroemeria, that is, ₹ 29105.12 is lower than that of the other two selected crops. However, the profit generated from Alstroemeria, ₹ 83010.76 is lower than what is generated from Lilium and Rose because the average price per stem of Alstroemeria is just ₹ 8.89, whereas that of Lilium and Rose is ₹ 17.60 and ₹ 9.19, respectively. The average total production of Lilium stands at ₹ 7571.36 and the marketed quantity, 6995.46 stems per year, is also lower than that of Alstroemeria and Rose but with high price of ₹ 17.60 per stem generating an income of ₹ 90087.03, which is

Table 6. Decision Making Particulars of Cultivating Cut Flowers in the Study Area

Sl. No.	Particulars	Male (%)	Female (%)	Both Male and Female (%)	Total (%)
1.	Selection of land	18.00	10.00	72.00	100
2.	Preparation of flower bed	9.00	60.00	31.00	100
3.	Selection of seeds	2.00	77.00	21.00	100
4.	Manuring	6.00	82.00	12.00	100
5.	Labour absorption	7.00	47.00	36.00	100
6.	Payment of wages	24.00	28.00	48.00	100
7.	Harvesting	0.00	100.00	0.00	100
8.	Market selection	0.00	91.00	9.00	100
9.	Price decision	0.00	92.00	8.00	100

Source: Field survey 2013-14

higher than the income from the other two crops. The average total production of Rose per 200m² per year has been recorded at 12314.17 stems with productivity, marketed quantity, and price at 61.57, 11299.98 stems, and ₹ 9.19, respectively. It is evident from the Table 4 that cost of Rose production, that is, ₹ 40954.33, which is a combination of input cost and labour cost, is higher than that of the other two crops because Rose is usually infected and thus, requires more chemicals to control pests and diseases. At the same time, it incurs special cost of packing the flower buds.

The Table 5 shows the regression analysis of the three selected cut flowers production in Kohima and it indicates that all the selected variables are showing expected signs. The Table 5 reveals that in case of Alstroemeria, capital expenditure is positive and highly significant at the 1% level, which indicates that with every 1% increase in capital expenditure, income will increase by 0.667 times. Coefficient of productivity and price is positive and statistically significant at the 5% and 10% level, respectively. Similarly in the case of Lilium, coefficient of capital and price is positive and statistically significant at the 1% level, that is, a 1% increase in both capital expenditure and price per stem of flower will increase grower's output by 0.53 times and 1.451 times, respectively. While coefficient of education of Lilium growers is negative and insignificant, that is, with a 1% increase in the educational qualification of the growers, output will be reduced by -0.019 times. This is so because when the growers attain more educational qualification, they concentrate more on other activities and not farming. Education, labour, and capital in case of Rose shows statistical significance at the 1% level with the dependent variable. It clearly indicates that with every 1% increase in grower's education, labour cost, and capital expenditure, output will increase by 0.657, 0.290, and 0.833 times, respectively.

(3) Women's Role in Decision Making : The Naga society is still dominated by men and they take most of the decisions. Lack of opportunities for women for using their potential becomes a major hindrance in empowering them. With globalization, the mindset of the Naga society has broadened and some improvements have been made with regard to decision making of women, if not in society, at least within the family. Subsidies from the state horticulture department have further improved their situation in cultivating flowers without depending on others as far as financial matters are concerned.

The Table 6 represents the decision making abilities of women in flower cultivation in the study area. Women are not given the right to hold land. Thus, they cultivate flowers on their husband's land if married and on father's land if single. Land ownership by women is not common among the women in Nagaland, though some of them own land which they buy from their own income. The decision to select land to cultivate flowers is mainly done in consultation with the male members of the family. It is clear from the Table 6 that of the total respondents, 18%

Table 7. Problems Faced by Growers in the Production and Marketing of Cut Flowers (%)

Sl. No.	Problems	Kohima (Rank)
1.	High price of fertilizers and insecticides	30.00 (x)
2.	Increase in cost of production	54.00 (vii)
3.	Attack by pest and disease	55.00 (vi)
4.	Lack of scientific knowledge and training	84.00 (i)
5.	Lack of quality seeds	12.00 (xii)
6.	Lack of cold storage	18.00 (xi)
7.	Inexperience labour	78.00 (iii)
8.	Underdeveloped transportation and communication	66.00 (v)
9.	Lack of adequate market facilities	77.00 (iv)
10.	Low market price	83.00 (ii)
11.	Lack of market information	40.00 (viii)
12.	Spoilage	33.00 (ix)

Source: Field survey 2013-14

Figures in the column Kohima (Rank) that are not in parenthesis are percentages.

cultivated on the land for which the decision was taken by men alone, while 10% took the decision themselves ; 72% took the decision in consultation with the male family members. For flower bed preparation, 60% of the growers made the decision alone, 31% of the growers took the decision along with the male members, and 9% of the growers depended solely on the male members. The kind of flowering plants to be planted for commercial purposes was exclusively selected by 77% of the cultivators herself, 21% by both male and female cultivators, and only 2% by the males alone. Decision to harvest the produce was entirely taken by the grower as she knew about the best time for harvesting. Other decisions such as the type of manure to apply, where to sell the produce, and the price to be charged for the flowers were mainly decided by the women alone (82%, 91%, and 92% of the total respondents, respectively). This decision making ability of the cultivators in flower production empowers them to strengthen their socioeconomic condition and improve management and organizational efficiency.

(4) Constraints Faced by the Growers : Development made in the floriculture sector through the introduction of advanced technology has overhauled this industry in Nagaland. Protected cultivation under poly houses has become lucrative in nature, attracting more women to take up cut flower production and marketing. However, this industry is at its nascent stage in Nagaland, and thus faces many shortcomings and difficulties.

The Table 7 shows various problems faced by growers and these are ranked according to their effect on growers. Lack of scientific knowledge and training has been recorded as the highest problem faced by 84% of the growers ; 83% of the growers stated that they received low price for their produce, and 78% had difficulty dealing with inexperienced labour. Since the climate of Kohima is moderate, the need for cold storage to keep cut flowers after harvest does not necessarily arise and thus, only 18% of the growers had problems with its shortage, while only 12% of the growers faced problems in getting quality seeds.

Policy and Research Implications

The following policy implications can be suggested to further strengthen this sector for empowering women associated with the floriculture industry:-

- (i) Create awareness on the use of fresh-cut flowers through advertisements.
- (ii) Regulate the price of cut flowers depending upon their quality.
- (iii) Create a common flower market where all the growers can bring their produce and sell it to retailers and even export it to other parts of India,
- (iv) Provide more training facilities to the growers on pre and post harvest management.
- (v) Improve infrastructure facilities for flower production and marketing.
- (vi) Establish adequate cold storage facilities and tissue culture lab for multiplication of flowers.
- (vii) Improve the market information delivery system.
- (viii) Strong support from the government to promote production and marketing, and create financial facilities for the growers is required.

Availability of accurate and reliable data on floriculture in the state is inadequate and scanty. Empirical studies on horticulture and floriculture need more grass root research to promote floriculture industry in general and women empowerment, in particular, in the state of Nagaland.

Conclusion

The inception of HMNEH has made the scope of floriculture in Nagaland wider. A sector which was just a mere hobby is now being used to earn a living and is directly or indirectly contributing towards economic development. Women are now able to empower themselves by taking their own decisions. Unlike other flower producing states of India, it is this particular state which is fully dominated by women. Thus, further development of this sector has brighter prospects to empower women in Nagaland because of increase in use of flowers on every occasion. The favourable and pleasant climate of Kohima and availability of fertile soil has encouraged women to take up the flower business. Increased participation of women in floriculture activity has boosted up employment opportunities not only for women and unemployed female youth, but also for local and non-local labourers. Income generated from this sector is enabling growers to divert their returns towards more productive activities such as further development of their nurseries, increase in production, fulfilling their personal needs, fulfilling needs of their family and children's education, and so forth, thus empowering them to take their own decisions for spending their income.

Limitations of the Study and Scope for Future Research

The data collected from the sample respondents might not be accurate as no written records were maintained by them, and the figures were mainly taken from rough calculations done by the respondents. The unwillingness of the respondents to reveal the quantity marketed and income generated was also one of the main drawbacks. However, despite these limitations, efforts were made to educate the respondents about the importance of this study in order to minimize the errors. Discussion with the authorities of the State Horticulture Department, Nagaland further made it possible to cross check the collected data.

Since it is the initial stage of floriculture in the state of Nagaland with limited production and marketing conditions, there is scope for future research in the areas of production and marketing efficiency, area and marketing expansion, and other sustainable developments in the field of floriculture as well as in empowering women in the state of Nagaland.

References

- Baris, M. E., & Uslu, A. (2009). Cut flower production and marketing in Turkey. *African Journal of Agricultural Research*, 4(9), 765-771.
- Ebrahimi-far, T. (2007). Women, sustainable development and dialogue among civilizations. *Pakistan Horizon*, 60(4), 93-107.
- Gray, K.R., & Finley-Hervey, J. (2005). Women and entrepreneurship in Morocco: Debunking stereotypes and discerning strategies. *International Entrepreneurship and Management Journal*, 1, 203-217. doi:10.1007/s11365-005-1129-3
- Indian Council of Agricultural Research (ICAR) (2004). *Annual Report 2003-04. Women in Agriculture*. Retrieved from <http://www.icar.org.in/files/ar0304/12-WOMEN%20IN%20AGRICULTURE.pdf>
- Jahan, H. (2009). Production, post harvest handling and marketing of cut-flowers in Bangladesh: An agribusiness study. *South Asian Association for Regional Corporation Journal of Agriculture*, 7(2), 1-14.
- Khan, M.A. (2005). Development of commercial floriculture in Asia and the Pacific- Issues, challenges and opportunities. *The National Seminar on Streamlining: Production and Export of Cut-Flowers and House Plants*, Islamabad, Pakistan.
- Korovkin, T. (2003). Cut flower export, female labor and community participation in highland Ecuador. *Latin American Perspective*, 30(4), 18 - 42.
- Manzoor, R., Shahid, S.A., & Baluch, M. (2001). Economics of floriculture in Pakistan: A case study of Lahore market. *Pakistan Economics and Social Review*, 39(2), 87-102.
- Mou, N. S. (2012). Profitability of flower production and marketing system of Bangladesh. *Bangladesh Journal of Agricultural Research*, 37(1), 77-95.
- Noguera, M., Alvarez, C., & Urbano, D. (2013). Socio-cultural factors and female entrepreneurship. *International Entrepreneurship and Management Journal*, 9(2), 183-197. doi:10.1007/s11365-013-0251-x
- Sudhagar, S. (2013). Production and marketing of cut flower (Rose and Gerbera) in Hosur taluk. *International Journal of Business and Management Invention*, 2(5), 15-25.
- Thippaiah, P. (2005). *Floriculture in Karnataka: Performance, problems and prospects*. Nagarbhavi, Bangalore : Agricultural Development and Rural Transformation Unit, Institute for Social and Economic Change.