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Socio-economic profile and land use pattern of marigold and rose growers in Varanasi district of Uttar Pradesh

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ABSTRACT

The present study was conducted in the Varanasi district of Uttar Pradesh during 2024–25 to assess the socio-economic status and cropping pattern of marigold and rose growers. A multistage purposive cum random sampling technique was adopted for the selection of the study area, while 200 farmers were selected. Primary data were collected through personal interviews using a pre-tested structured schedule and analysed using descriptive statistical tools such as frequency, mean and percentage. The findings revealed that the majority of the respondents (74%) belonged to the marginal farm category. Most farmers (54%) had medium-sized families (5–7 members) and nearly half (48.00%) belonged to the middle age group. About 49 percent of the respondents had 10–20 years of farming experience and 95 percent were literate, with high school education being the most common qualification. Flower cultivation was the sole occupation for 27.5 percent of the farmers, whereas the remaining respondents combined floriculture with agriculture, allied activities, business or government service. Approximately 35 percent of the households reported an annual family income between ₹1 and ₹2 lakh. The overall average gross cropped area was 1.68 and 2.09 ha with an overall cropping intensity of 207.73 and 216.58. percent respectively, indicating intensive utilization of cultivated land.

Keywords: Cropping intensity, Cropping pattern, Floriculture, Marigold, Rose, Socio-economic status

Introduction

Floriculture has grown to be a vital commercial activity in agriculture in the age of globalization. With the potential to create lucrative self-employment for small and marginal farmers and raise the income of developing nations, it has emerged as a realistic and profitable alternative (Kunwar and Bist, 2021; Wali *et al.*, 2025) [1]. Growing of flowers and ornamental crops is a fast-growing global enterprise in today's world (Hashim *et al.*, 2020) [2]. Around 145 countries are engaged in floriculture worldwide, with the Netherlands, the United States, Colombia, and Italy being the major producers and traders, accounting for roughly 43.7% of the global market share (Anumala *et al.*, 2021) [3]. The floriculture industry has been recognized by the government as a main drive sector due to its significant export potential and various financial incentives are being offered to promote the establishment of Export-Oriented Units (EOUs) in India (Singh *et al.*, 2013) [4]. In India, historically consumers purchase floricultural products because of traditions, culture and lifestyle. The majority of floral goods are offered to the god in temples or at households (Kadam *et al.*, 2019) [5]. India is also well-suited for the growth of floriculture activities due to its rich biodiversity, varied agroclimatic conditions, and trained labour force (Bobde *et al.*, 2023) [6]. The total area of under floriculture is about 296.74 thousand hectares with the production of 2,284.46 MT of loose flower and 946.54 MT of cut flowers in 2023-2024 (Titisari, 2025) [7].

Marigold (*Tagetes* spp.) is a major floricultural crop in India, widely grown throughout the nation owing to its attractive blooms, distinctive aroma, and adaptability to a wide range of agro-climatic environments (Kumar *et al.*, 2024) [8]. It is highly demanded due to its various applications in landscaping, garland preparation, poultry feed, natural dye production, use as a trap crop and as a loose flower (Yadav *et al.*, 2019) [9]. Rose (*Rosa indica*) is a highly valued ornamental flower and is widely acknowledged as the “Queen of Flowers” owing to its unparalleled beauty, fragrance, and aesthetic appeal (Patel *et al.*, 2007) [10]. It is one of the topmost selling flowers in the international flower trade and holds the foremost position among commercial cut flowers (Verma *et al.*, 2020) [11]. Rose flower petals are used for making garlands, for religious offerings and floral prearrangement. About 80% of rose flower are used for rose water, 10% for attar, 1-2% for Pankhuri and remaining for gulkand, gul-roghan and rose sharbat. Its fruit is rich source of Vitamin c and rose oil is anti-HIV, antibacterial and antioxidant. (Rahul *et al.*, 2022; Verma *et al.*, 2022) [12, 13].

Although the extraordinary value and need for flowers in religious ceremonies, the demand for flowers is increasing nationwide due to increase in per capita income, Varanasi is unable to supply its own needs, which is why flowers are imported into the Varanasi district (Mohammad *et al.*, 2017; Gopal *et al.*, 2026) [14, 15]. As a source of employment and revenue, the production, harvest, post-harvest, packing, transportation, and distribution activities offer enormous growth potential. The socioeconomic and productive aspects of this in

dustry are not well understood (Hernandez *et al.*, 2013) [16]. Therefore, the objective of this study was to determine the socio-economic and cropping intensity of marigold and rose farmers in Varanasi.

Materials and Methods

The present study was conducted in the Varanasi district of Uttar Pradesh with the objective of determine the socio-economics status of marigold and rose farmers. Among the eight blocks of the district, four blocks, namely Arajilne, Chiraigaon, Kashi Vidyapeeth and Baragaon, were purposively selected on account of their relatively larger area under marigold and rose cultivation. A list of villages from the selected blocks was obtained from the respective block headquarters and five villages from each block were chosen purposively for the survey. The sampling design followed a multistage purposive sampling approach for the selection of the district, blocks, and villages. Subsequently, 200 farmers were selected, comprising 100 marigold growers and 100 rose growers through purposive cum random sampling technique. The study relied on primary data collected during the year 2024–25. Information relating to age, income, family size, education qualification, etc. was recorded through personal interviews conducted with the help of a pre-tested and structured schedule of enquiry. This method facilitated the collection of reliable and comprehensive data from the sampled respondents. Collected data were analysed using various statistical tools *i.e.* Frequency, mean and percentage.

$$\text{Cropping intensity} = \frac{\text{Netcultivatedarea}}{\text{Grosscroppedarea}}$$

Results and Discussion

Farmers socio-economic status is a measure of their social and economic standing in comparison to other members of the community. It plays a crucial role in determining one's quality of living, household food and nutritional security, livelihood pattern, and accessibility to common resources. Socio-economic status of marigold and rose growers have been concluded through various factors, which have emphasised the production aspect like family size, age, land holding, education, occupation, farming experiences, and annual family income. The outcome of all these components has been presented in Table 1.

Average area supervised by farmers for marigold and rose production

It is clear from Table 1 that the majority of farmers were belongs to marginal category (74%) followed by small category (26%). The average land holding and net cultivated area for marginal farmers was 0.78 ha and 107.3 ha, whereas for small farmers it was about 1.42 ha and 69.68 ha respectively.

Family size of marigold and rose farmers

The family size of farmers plays a crucial role in both household and farming activities, as a larger number of family members provides more labour for agricultural operations and allows the workload to be shared among members efficiently. The Table 1 has given the details about the family size of the marginal and small category farmers. It reveals that 54 percent of the respondents belongs to medium family size (5-7 members), followed by small family size (24.50%) and left-over 21.50 percent of the sample farmers have large family size (more than 7). This also shows that most of the respondents have nuclear families and reduces the reliance on hired labour.

Age composition

The respondents' ability and efficiency in carrying out various economic activities related to flower production are significantly correlated with their age. The Table 1 has clearly shown that out of the 200 sample respondents, 48.00 percent of the farmers belongs to middle age group (36-45 years). The age group has been found to be relatively higher in case of marginal farmers (51.56%) in comparison to small farmers (41.67%). In case of senior middle-aged majority of farmers have been found in small category farmers (20.83), followed by marginal farmers (16.41%).

Farming experience

It is clearly shown in the Table 1 that the most of farmers (49.00%) were having the flower farming experience between 10 to 20 years, 30.50 percent farmers were having the flower farming experience less than 10 years, while 20.50 percent farmers were having above 20 years' experience of flower farming. Farming experience may help the farmers to minimise the inputs cost and increase the production with the use of limited resources available in the farm.

Table 1. Socio-economic status of flower (Rose and Marigold) growers

S. No.	Particulars	Size group of farms		
		Marginal	Small	Overall
1	Farmer/Grower (Number)	148 (74)	52 (26)	200 (100)
2	Average land holding (ha.)	0.78 (35.45)	1.42 (64.55)	2.20 (100)
3	Net cultivated area (ha.)	107.30 (60.63)	69.68 (39.37)	176.98 (100)
4	Family-size (Number)			
	Small (1-4 members)	27 (21.09)	22 (30.55)	49 (24.50)
	Medium (5-7 members)	76 (59.38)	32 (44.45)	108 (54.00)
	Large (> 7 members)	25 (17.53)	18 (25.00)	43 (21.50)
5	Age composition of flower growers (Year)			
	Young (25-35)	34 (26.56)	23 (31.94)	57 (28.50)
	Middle (36-45)	66 (51.56)	30 (41.67)	96 (48.00)
	Senior middle (46-55)	21 (16.41)	15 (20.83)	38 (18.00)
	Old (56-65)	7 (5.47)	04 (5.56)	11 (5.50)
6	Farming experience (Year)			
	Low (< 10)	41 (32.03)	20 (27.78)	61(30.50)
	Medium (10 to 20)	61 (47.66)	37 (51.39)	98 (49.00)
	High (> 20)	26 (20.31)	15(20.83)	41 (20.50)
7	Educational qualification (Number)			
	No formal education	07 (4.47)	03 (4.17)	10 (5.00)

(continued on next page)

	Primary school	12 (9.37)	05 (6.94)	17 (8.50)
	Middle School	17 (13.28)	08 (11.11)	25 (12.50)
	High school	38 (29.69)	24 (33.33)	62 (31.00)
	Intermediate	31 (24.21)	20 (27.78)	51 (25.50)
	Graduate	17 (13.28)	08 (11.11)	25 (12.50)
	Post Graduate	06 (4.69)	04 (5.55)	10 (5.00)
8	Occupation (Number)			
	Floriculture	37 (28.90)	18 (25.00)	55 (27.50)
	Floriculture + Other agricultural activity	48 (37.50)	25 (34.72)	73 (36.50)
	Floriculture + Allied activity	21 (16.41)	14 (19.44)	35 (17.50)
	Floriculture + Business	14 (10.94)	09 (12.50)	23 (11.50)
	Floriculture + Gov. service	8 (6.25)	6 (8.33)	14 (7.00)
9	Annual family income (Number)			
	Less than 1L	19 (14.84)	03 (4.17)	22 (11.00)
	1L-2L	51 (39.84)	19 (26.39)	70 (35.00)
	2L-4L	43 (33.60)	26 (36.11)	69 (34.50)
	More than 4L	15 (11.72)	24 (33.33)	39 (19.50)

Note: *Figures in the parentheses indicate percentage of the total

Education-wise distribution of growers

The level of education plays a crucial role in improving farm productivity, optimizing the use of available resources, and enhancing rural livelihoods. It serves as a fundamental basis for the progress of individuals, communities and the country at large. In Table 1 the education status of flower growers has been classified into different categories *i.e.* no formal education, primary school, middle school, high school, intermediate, graduate and post-graduate. An examination of the data indicates that a large proportion of the flower growers were educated (95%). Among the literate farmers, about 5 percent farmers have done post graduate, 12.50 percent have graduate pass out, 25.50 percent attained intermediate, 31.00 percent high school, 12.50 percent middle school and 8.50 percent primary level education.

Occupation wise distribution

The sample farmers were engaged in agricultural operations while simultaneously pursuing other occupations, including agricultural allied activities, private business and government jobs. Therefore, their occupation has been consisted of both main and subsidiary activities. A perusal of the table 1 indicates that about 27.50 percent of farmers engaged in flower cultivation as their main occupation, whereas 72.50 percent of farmers were engaged in flower cultivation as well as other activities like agriculture and allied activities, business activities and government services. About 28.90 percent of the marginal farmers and 25.00 percent of small farmers has flower cultivation as their sole source of income. This indicates that the one-fourth of the sampled farmers total depend on the floriculture for their livelihood and remaining three-fourth of the sampled farmers have secondary options for income generation.

Annual family income of sampled farmers

The annual family income of the sampled farmers is directly correlated with the standard of living and adoption of the level of production technology. The average annual family income earned by flower growers from all the sources could be observed from Table 1. It is clearly shown in table that the majority of annual family income of farmers (40.50%) is between Rs. 1.0 to 2.0 lakhs, followed by 34.50 percent of annual family income is between Rs. 2.0 to 4.0 lakhs, together they account 69.5 percent of the total and about 19.50 percent of farmers earned more than Rs. 4 lakhs per annum. Whereas only 11 percent of sampled farmers have annual family income less than Rs. 1 lakh per annum. This suggest that the flower cultivation is good source of income for farmers and they could make more profit as compare to other agricultural activity *i.e.* commercial crop and vegetable cultivation.

Cropping pattern of marigold farmers

The cropping pattern signifies the allocation of land utilized for the production of various goods during a particular season of year. The availability of resources and their application in a diversity of agroclimatic conditions is the most important factor that influence the investment for different inputs on a farm and the revenue of producers.

The table 2 shows the cropping pattern adopted by marigold farmers whose net cultivated area was 0.68 ha and 1.26 ha for marginal and small farmers respectively. The average gross cropped area was 1.68 ha, with marginal farmers cultivating an average of 1.44 ha and small farmers cultivating 2.52 ha. The area under marigold on farms change with season to season, for kharif it was 0.18 ha for marginal and 0.32 ha small farms, for rabi it was 0.12 ha and 0.23 ha for marginal and small farms and for zaid, it was 0.1 ha for marginal and 0.16 ha small farms.

Table 2. Cropping Pattern of marigold farmers in the study area (ha.)

S. No.	Crop	Marginal	Small	Overall average
A	Kharif	0.68(47.22)	1.26(50)	0.81(48.07)
1	Paddy	0.28(19.44)	0.48(19.05)	0.32(19.29)
2	Pigeon Pea	0.11(7.64)	0.2(7.94)	0.13(7.73)
3	Maize	0.07(4.86)	0.16(6.35)	0.09(5.35)
4	Marigold	0.18(12.5)	0.32(12.7)	0.21(12.55)
5	Vegetables	0.04(2.78)	0.1(3.97)	0.05(3.17)
B	Rabi	0.47(32.64)	0.83(32.94)	0.55(32.69)
1	Wheat	0.22(15.28)	0.34(13.49)	0.25(14.67)
2	Mustard	0.02(1.39)	0.08(3.17)	0.03(1.98)
3	Gram	0.05(3.47)	0.1(3.97)	0.06(3.63)
4	Marigold	0.12(8.33)	0.23(9.13)	0.14(8.58)
5	Vegetables	0.06(4.17)	0.08(3.17)	0.06(3.83)
C	Zaid	0.29(20.14)	0.43(17.06)	0.32(19.1)
1	Moong	0.04(2.78)	0.07(2.78)	0.05(2.77)
2	Urd	0.08(5.56)	0.1(3.97)	0.08(5.02)
3	Marigold	0.1(6.94)	0.16(6.35)	0.11(6.74)
4	Vegetables	0.07(4.86)	0.1(3.97)	0.08(4.56)
	Gross Cropped Area	1.44(100)	2.52(100)	1.68(100)

Note: *Figures in the parentheses indicate percentage of the total

Cropping pattern of rose farmers

The cropping pattern followed by rose growers were shown in table 3, where overall average area covered in kharif were about 46.17 per cent of total gross cropped area followed by rabi (33.11%) and zaid (20.72%). Majorly they adopt rice-wheat cropping system along with

other crops. Whereas, the rose cultivation was practiced throughout the year, occupying 0.27 ha (15.61%) on marginal farms and 0.41 ha (13.99%) on small farms in all three cropping seasons, reflecting the perennial nature of the crop. The overall average area under rose cultivation was 0.31 ha, accounting for 14.93 percent of the gross cropped area.

Table 3. Cropping Pattern of rose farmers in the study area (ha.)

S. No.	Crop	Marginal	Small	Overall average
A	Kharif	0.77(44.51)	1.42(48.46)	0.97(46.17)
1	Paddy	0.32(18.5)	0.41(13.99)	0.35(16.6)
2	Pigeon Pea	0.08(4.62)	0.16(5.46)	0.1(4.98)
3	Maize	0.05(2.89)	0.14(4.78)	0.08(3.83)
4	Rose	0.27(15.61)	0.41(13.99)	0.31(14.93)
5	Vegetables	0.05(2.89)	0.3(10.24)	0.13(5.98)
B	Rabi	0.59(34.1)	0.93(31.74)	0.69(33.11)
1	Wheat	0.2(11.56)	0.3(10.24)	0.23(11)
2	Mustard	0.03(1.73)	0.07(2.39)	0.04(2.01)
3	Gram	0.04(2.31)	0.08(2.73)	0.05(2.49)
4	Rose	0.27(15.61)	0.41(13.99)	0.31(14.93)
5	Vegetables	0.05(2.89)	0.07(2.39)	0.06(2.68)
C	Zaid	0.37(21.39)	0.58(19.8)	0.43(20.72)
1	Urd	0.05(2.89)	0.09(3.07)	0.06(2.87)
2	Rose	0.27(15.61)	0.41(13.99)	0.31(14.93)
3	Vegetables	0.05(2.89)	0.08(2.73)	0.06(2.82)
	Gross Cropped Area	1.73(100)	2.93(100)	2.09(100)

Note: *Figures in the parentheses indicate percentage of the total

The study also revealed that the marigold and rose were the two major flowers cultivated in Varanasi whose cropping pattern were shown in table 2 and table 3 indicating that they both follow the same cropping pattern. But there is one extra crop (Moong) were adopted by marigold growers.

Cropping intensity of marigold growers

Cropping intensity is an indicator of the intensity of land utilization, representing the number of times the same net cultivated area is cropped during an agricultural year. A higher cropping intensity re-

flects more efficient use of agricultural land through multiple cropping.

The cropping intensity on the sampled farms were of marigold presented in table 4. It was found to be high, indicates the intensive utilization of cultivated land through multiple cropping. Marginal farms recorded the highest cropping intensity (211.76%), suggesting that marginal landholders made more intensive use of their limited land resources compared to small farm-size groups. The overall cropping intensity was 207.73 percent shows that the cultivated land was cropped more than twice during the agricultural year.

Table 4. Cropping intensity of marigold growers of different size groups in the study area

S. No.	Size group of farms	Number of farmers	Net cultivated area (ha.)	Gross cropped area (ha.)	Cropping Intensity (%)
1.	Marginal	78	0.68	1.44	211.76
2.	Small	22	1.26	2.52	200.00
3.	Overall	100	0.81	1.68	207.73

the agricultural year.

Cropping intensity of rose growers

Table 5 reveal the cropping intensity of rose-growing farms. The results reveal that the overall cropping intensity was 216.58 per cent, indicating that the cultivated land was utilized more than twice during

Table 5. Cropping intensity of rose growers of different size groups in the study area

S. No.	Size group of farms	Number of farmers	Net cultivated area (ha.)	Gross cropped area (ha.)	Cropping Intensity (%)
1.	Marginal	70	0.77	1.73	224.68
2.	Small	30	1.42	2.93	206.34
3.	Overall	100	0.97	2.09	216.58

Conclusion

The study concludes that marigold and rose cultivation in Varanasi district is largely the province of marginal and small farmers, who despite limited landholdings, achieve notable socio-economic stability through high literacy, considerable farming experience and diversified livelihood strategies combining floriculture with agriculture, allied activities, business or government service. The flower cultivation yields superior output per unit area compared to conventional crops. The marigold and rose together occupy a significant and consistent share of the gross cropped area across the kharif, rabi, and zaid seasons, along with cereals, pulses and vegetables that support food security. The smaller landholders compensate for limited land through intensive multiple cropping. Overall, marigold and rose cultivation emerges as a socio-economically significant and land-use-efficient enterprise, and strengthening market linkages, extension services, and input access could further enhance farmer incomes and livelihood security in the region.

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