# Socio-Economic analysis of cauliflower growers in Jammu region of Jammu and Kashmir (UT)

**Original Research Article**


## ABSTRACT

A comprehensive investigation was undertaken in 2020-2021 in the Jammu district of the Jammu region, Jammu and Kashmir (Union Territory), employing a descriptive study design. The primary objective was to discern the socio-economic characteristics of the cauliflower cultivators. Utilizing a multistage sampling methodology, a total of 160 cauliflower growers constituted the study sample. The results indicate that a substantial proportion of respondents (37%) fall within the middle-age category, holding matriculation level education (41%). The majority of respondents (54%) reside in joint family setups and agriculture emerges as the predominant occupation (76%). The majority of cauliflower growers in the study area have marginal farm sizes, primarily irrigated using canal water. While several critical information sources were conveniently located near the study area, including the agriculture office and input stores, access to others such as the SAU, KVK and the market was more distant. Respondents occasionally sought information from nearby sources in their villages.



**Keywords**: **Cauliflower growers, Socio-economic characteristics, Challenges**




## 1. INTRODUCTION

India's diverse climatic conditions, spanning from temperate to tropical, create an optimal environment for the robust development of the agricultural and allied sectors. Serving as the linchpin of the Indian economy, agriculture ensures livelihood security for a substantial portion of the population. About 70 percent of India's people directly or indirectly depend on agriculture and related activities as their primary income source (FAO, 2021). Cauliflower (Brassica oleracea var. botrytis L.) commonly known as “Phoolgobhi” is the foremost well-known vegetable presented in India in 1822 by Dr. Jemson, who was the Incharge of Botanical Plant, Saharanpur, Uttar Pradesh (Nath et al., 1994) and originated from wild cabbage (Brassica oleracea var. sylvestris) and its centre of origin is believed to be the Island of Cyprus (Kohli et al., 2008). In the dynamic agricultural landscape, the horticultural sector has emerged as a key

player, globally securing livelihoods for farmers, contributing approximately 30 percent to the overall agriculture sector and has experienced rapid growth (MoA, 2018). Among the array of crops cultivated in India, vegetables play a pivotal role in the country's food supply, contributing to a balanced and nutritious diet. The climatic diversity of India allows for year-round vegetable cultivation across different zones, fostering the growth of various vegetables. The cultivation of vegetables not only serves as a lucrative source of income for farmers in a short period but also generates substantial employment through intensive cultivation. Post-harvest losses during handling, transportation, storage and distribution of vegetable commodities are the major problems of perishable vegetables. In addition of this due to poor handlings causes more loss and increases the supply cost due to increased transport and marketing cost (Subrahmanyam, 1986). Over the years, there has been a noteworthy expansion in both the area dedicated to vegetable cultivation and the overall production. From 1991-92 to 2017-18, the area under vegetables increased from 5593 thousand hectares to 10259 thousand hectares, and vegetable production rose from 58532 thousand mt to 184394 thousand mt (Anonymous, 2018a). Cauliflower (Brassica oleraceae var. botrytis) holds a significant position among vegetables in India, contributing to both nutritional and economic aspects for growers. Cauliflower alone accounts for 4.70 percent of the country's vegetable production (Anonymous, 2018b), contributing over 32.5 percent to the global cauliflower production. The country's cauliflower cultivation spans approximately 465 thousand hectares, producing about 9083 thousand mt, with a productivity of 19.2 t/ha (MoA, 2018). 14.50% of orange growers were educated up to primary level, majority of orange growers (60.50%) were educated up to high school level and 25% of beneficiaries educated up to college level (Chikhale et al., 1996). The union territory of Jammu and Kashmir, located in the North-Western Himalayan region, boasts a diverse agro-climate, encompassing cold arid, temperate, intermediate, and sub-tropical zones (Kumar *et al*., 2017). Recognized for its horticultural produce, the region provides favorable conditions for cultivating various crops, including temperate fruits, medicinal and aromatic plants, floriculture, mushrooms, plantation crops and vegetables. In Jammu and Kashmir, vegetables cover an area of about 56.29 thousand hectares, with a production of about 1226.02 thousand metric tonnes (MoA, 2018). 52.70 per cent of the orange growers were from middle age group, whereas 36.44% and 10.83% from young and old age group, respectively (Hagre, 1991). Cauliflower cultivation in Jammu and Kashmir extends across 3.40 thousand hectares, yielding a total production of 105.40 thousand mt, with a productivity of 31.02 t/ha (MoA, 2018). Notably, Jammu and Kashmir exhibit an average cauliflower productivity of 31 t/ha, surpassing the national average and standing as the

highest among all states. This underscores the region's expertise in cauliflower cultivation, making a substantial contribution to both regional and national production levels.

## 2. MATERIALS AND METHODS

The study conducted in Jammu district of Jammu region, Jammu and Kashmir in 2020-2021, celebrated as "International Year of Fruits and Vegetables". The study employed a descriptive design and a multistage sampling method. Firstly, Jammu district was purposively chosen due to its significant cauliflower cultivation area and production. The selection narrowed down to the selection of one agricultural sub-division i.e., 'Marh', the largest cauliflower cultivation area in Jammu district, out of four sub-divisions falling under Jammu district. Then, the initial list of cauliflower growers, provided by the Directorate of Agriculture, Jammu, contained 281 farmers from 32 villages in Marh. Recognizing potential omissions, the researcher made personal calls to validate and update the list, resulting in a modified list of 500 farmers. From this, a random sample of 160 farmers growing cauliflower in a minimum area of 0.05 ha was selected for structured interviews. A questionnaire with both open and closed-ended questions was developed and pre-tested to ensure clarity and eliminate testing biases in a non-sampled area.

### 2.1 Percentage

The frequency of a specific cell was determined by dividing it by the total number of respondents in that category and then multiplying the result by 100.

$$\text{Percentage} = \frac{\text{Actual no. of respondents}}{\text{Respondents or Score}} * 100$$

### 2.2 Frequency

The calculation involved summing up the total number of respondents within each specific category.

### 2.3 Mean

It was calculated to the average value of particular score. The formula is given below-

$$\text{Mean score} = \frac{\text{Total scores on particular item}}{\text{Number of respondents}}$$

### 2.4 Categorization

The categorization of respondents into different groups based on age and education utilized the cube root method, as outlined by Singh (1975).

## 3. RESULTS AND DISCUSSION

Analyzing the socio-economic attributes of the sampled households provides insights into the foundational information of farmers. The data reveals a nearly equal distribution with 37 per cent of respondents falling within the age range of 46 to 59 years, 33 per cent below 45 years, and 30 per cent above 60 years. A significant majority of farmers (97%) were literate, contrasting with a mere 3% classified as illiterate. Educational backgrounds exhibited diversity with 41 per cent having matriculation-level education, 24 per cent completing 10+2, 21 per cent at the middle level and 7 per cent at the primary level, only a small proportion (4%) pursued education beyond graduation, aligning with existing findings of Kumar and Jahanara (2018) Kumar *et al.* (2018). In terms of phone connectivity, 94 per cent of respondents possessed mobile phones with 40 per cent owning smartphones and 60 per cent using feature phones, consistent with previous research of Kumar *et al.* (2021). Regarding family structure, 54 per cent of sampled households were joint families, while 46 per cent were nuclear families (Kumar *et al.* 2018). This trend aligns with the inclination towards family belongingness in Indian rural societies, fostering a positive attitude towards joint families for enhanced child rearing and procreation (Tomar *et al.* 2020). Family size predominantly comprised small households (66 % with below 5 members), followed by medium-sized families (28 % with 6-8 members) and larger families (6% with above 9 members), echoing findings reported by Kumar (2012). A significant proportion (76%) of respondents engaged solely in agriculture as their primary occupation (Dan *et al.* 2020). Additionally, 11 per cent were involved in both agriculture and another occupation, 7 per cent in agriculture and service, 4 per cent in agriculture and business and 2 per cent in agriculture and labor. Landholding sizes varied with majority of farmers (51%) categorized as marginal (less than one hectare), 28 per cent as small (1-2 ha), 15 per cent as semi-medium (2-4 ha) and 6 per cent as medium (4-10 ha), consistent data from Jammu and Kashmir's Digest of Statistics 2018-19 and also alignied with the study of Sharma and Parihar (2021).

**Table 1: Socio-economic characteristics of the sampled households**

| Parameters | No. of respondents (n=160) | Percent of respondents |
|---|---|---|
| **Age of farmers** | | |
| Young (45 years and below) | 53 | 33 |
| Middle (46-59 years) | 59 | 37 |
| Old (60 years and above) | 48 | 30 |
| **Educational status of the farmers** | | |
| Illiterate | 5 | 3 |
| Primary | 11 | 7 |
| Middle | 33 | 21 |
| Matriculate | 65 | 41 |
| $12^{th}$ | 39 | 24 |
| Graduation and above | 7 | 4 |
| **Phone connection availability** | | |
| Smart Phone | 61 | 40 |
| Feature phone | 90 | 60 |
| **Family Type** | | |
| Joint families | 87 | 54 |
| Nuclear families | 73 | 46 |
| **Family size category** | | |
| Small family (5 members and below) | 105 | 66 |
| Medium family (6-8 members) | 45 | 28 |
| Large family (9 members and above) | 10 | 6 |
| **Occupation of the respondents** | | |
| Agriculture | 121 | 76 |
| Agriculture +Labour | 4 | 2 |
| Agriculture + Business | 7 | 4 |
| Agriculture + Service | 11 | 7 |
| Agriculture + Any other | 17 | 11 |
| **Categorization of farm size** | | |
| Marginal (< 1 ha) | 82 | 51 |
| Small (1-2 ha) | 45 | 28 |
| Semi Medium (2-4 ha) | 23 | 15 |

| | | |
|---|---|---|
| Medium (4-10 ha) | 10 | 6 |

*Figures in parentheses are the percentages and rounded off*

Canal water emerged as the predominant irrigation source, utilized by 80 percent of respondents as shown in Table 2, while 20 percent exclusively used bore wells and 10 percent solely employed tube wells for irrigation. A small percentage utilized lift irrigation exclusively (5%), both tube wells and canals (10%), both bore wells and canals (10%), both canals and lift irrigation (11%), and both bore wells and lift irrigation (1%), aligning with findings from Kumar (2012) Kumar and Nain (2013).

**Table 2: Distribution of respondents based on source of irrigation**

| **Source of Irrigation** | **No. of respondents (n=160)** | **Percent of respondents** |
|---|---|---|
| Only Tube well | 10 | 6 |
| Only Bore well | 14 | 9 |
| Only Canal | 80 | 50 |
| Only Lift irrigation | 5 | 3 |
| Both Tube Well and Canal | 16 | 10 |
| Both Borewell and Canal | 16 | 10 |
| Both Canal and Lift irrigation | 17 | 11 |
| Both Borewell and Lift irrigation | 2 | 1 |

*Figures in parentheses are the percentages and are rounded off*

The findings presented in Table 3 illustrate the mean distances between respondent villages and various agriculturally significant locations. The maximum average distance from the respondents' villages to the cauliflower selling point was 33.66 (±55.28) km, followed by 28.76 (±9.60) km to the KVK, 25.53 (±5.98) km to the Agriculture University, 19.29 (±5.92) km to the Forest office, 4.29 (±3.29) km to the market and 4.02 (±2.16) km to the agriculture office. Similarly, the distance to seed, fertilizer, and pesticide stores averaged 2.70 (±2.10) km. The main road was only 2.25 (±1.63) km away from the study area indicating good road connectivity between the study area and its surroundings.

**Table 3: Average distance of respondent farmers' villages from different agricultural-importance places**

| Average Distance (km)±S.D. | n=160 |
|---|---|
| Agriculture office | 4.02 ± 2.16 |
| Seed store | 2.70 ± 2.10 |
| Fertilizer store | 2.70 ± 2.10 |
| Pesticide | 2.70 ± 2.10 |
| Market | 4.29 ± 3.29 |
| KVK | 28.76 ± 9.60 |
| Agriculture University | 25.53 ± 5.98 |
| Main road | 2.25 ± 1.63 |
| Forest office | 19.29 ± 5.92 |
| Selling place of cauliflower | 33.66 ± 55.28 |

Table 4 presents the awareness and extent of contact of various information sources among respondents. While 27 percent aware of NGOs, none of them utilized this source for information. Similarly, although 98 percent were aware of input dealers, the majority (57%) only occasionally sought information from them. Awareness of progressive farmers was at 26 percent, yet most (61%) never contacted them. Radio and TV had high awareness rates (91% and 98% respectively), with most (35% for radio and 49% for TV) occasionally and regularly, respectively seeking information from these sources. Despite awareness of newspapers, the majority (59%) only occasionally sought information from them. Farmers showed higher awareness of the Department of Agriculture (98%), State Agricultural Universities (90%), and private agencies (87%) compared to Krishi Vigyan Kendras (11%). However, the majority only occasionally visited DoA (88%) and private agencies (75%). Surprisingly, despite awareness of SAUs and KVKs, the majority (76% and 78% respectively) never contacted them. Although most were aware of Kisan melas (97%) and Kisan call centers (29%), the majority (63% and 87% respectively) did not utilize these sources. However, the majority of respondents (93%) regularly utilized information from friends and relatives.

**Table 4: Distribution of respondents based on different sources of information**

| | No. of farmers* | Extent |
|---|---|---|

| Sources of information | Aware | Not aware | Regular | Occasional | Never |
|---|---|---|---|---|---|
| NGOs | 27 (17) | 133 (83) | 0 | 0 | 27(100) |
| Input dealer | 157 (98) | 3 (2) | 66 (42) | 89 (57) | 2(1) |
| Progressive farmer | 41 (26) | 119 (74) | 13(32) | 3(7) | 25(61) |
| Friends/Relatives | 160 (100) | 0 | 148(93) | 12(7) | 0 |
| Radio | 146 (91) | 14 (8.75) | 48(33) | 51(35) | 47(32) |
| Television | 157(98) | 3 (2) | 77(49) | 74(47) | 6(4) |
| Newspaper | 76(47) | 84 (53) | 13(17) | 45(59) | 18(24) |
| SAU | 144 (90) | 16 (10) | 1(1) | 34(23) | 109(76) |
| DoA | 157 (98) | 3 (2) | 7(4) | 138(88) | 12(8) |
| KVK | 18 (11) | 142 (89) | 1(5) | 3(17) | 14(78) |
| Private agencies | 140 (87) | 20(13) | 4(3) | 105(75) | 31(22) |
| Kisan Mela | 156(97) | 4 (3) | 37(24) | 99(63) | 20(13) |
| Kisan Call Centre | 47(29) | 113 (71) | 0 | 6(13) | 41(87) |

*Figures in parentheses are the percentages and are rounded off*

**Multiple Responses*

## 4. CONCLUSION

Cauliflower (*Brassica oleraceae* var. botrytis) holds paramount significance as a vegetable nationwide, contributing not only to nutritional well-being but also serving as a substantial source of economic returns for cultivators. India ranked as the world's second-largest producer and a notable exporter of cauliflower, follows China in global production. Within the study area, a discernible pattern emerges, showcasing cauliflower growers predominantly falling within the middle-age bracket, possessing educational qualifications at the matriculation level and residing in joint family structures with an average of up to five members. Agriculture assumes the pivotal role of the primary occupation among respondents in this rural context with marginal farm sizes prevailing as the norm. The principal irrigation source for cauliflower cultivation is canal water. The study area is distant from the State Agricultural University (SAU), Krishi Vigyan Kendra (KVK), and the market, but it is closer to the agriculture office and input store. Farmers in the study area occasionally accessed information from various sources. Accessing information from these sources equips farmers with vital knowledge of agricultural practices, market trends,

weather forecasts, and technological advancements, empowering them to make informed decisions and enhance productivity.

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