



# Personal, Socio-economic and Psychological Characteristics of Horticulture Crop Growers Practicing Protected Cultivation: A Critical Analysis

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## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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## ABSTRACT

The study was conducted during 2020 in Chikkaballapur district which comes under eastern dry zone (Zone-V) of Karnataka. In Chikkaballapur district, two taluks i.e. Sidlaghatta and Chikkaballapur taluks were purposefully selected for the study, since these taluks are having more area under protected cultivation technology. The ex-post-facto research design was used for the study. In

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the present investigation, ex-post facto research design was used. This design was considered appropriate, as it is a systematic empirical enquiry for measuring the phenomenon, which has already occurred and is continuing. The total sample size comprises 100 of which, 50 growers (25 Chrysanthemum and 25 Capsicum) were selected randomly from Chikkaballapur taluk. Similarly, 50 growers (25 Chrysanthemum and 25 Capsicum) were selected randomly from Sidlaghatta taluk. The results of the study show that more than half of the horticulture crop growers were comes under middle age category, nearly one-third of growers were educated up to high school, more than two-fifth of the growers were small farmers, nearly one-fourth of the growers belonged to medium experience category, more than two-fifth of growers belonged to medium mass media exposure category. More than two-fifth of Horticulture crop growers had high scientific orientation. Two-fifth of the growers had medium achievement motivation. two-fifth of the horticulture crop growers had medium extension participation, more than two-fifth of the growers had medium level management orientation, majority of the growers were accessibility to credit and subsidy and nearly half of the growers belonged to medium risk bearing ability.

*Keywords: Capsicum; chrysanthemum; protected cultivation.*

## 1. INTRODUCTION

India is primarily an agricultural country. Agriculture provides a living for more than two-thirds of India's population. It is now the primary source of income. It is the most important source of income for people in rural India. Farmers' economic conditions have improved as a result of higher returns from many perennial flower crops, plantation crops, and year-round availability of fruits and vegetables. Growing horticultural crops has been recognized as an ideal option for the improvement of livelihood security, attaining income and food security, enhancing employment generation and increasing income through value addition. It has also played a crucial role in women empowerment, as it provides employment opportunities in vegetable, floriculture, mushroom cultivation etc.

The present agricultural scenario in our country is a mixture of outstanding achievements and missed opportunities. If India has to emerge as the world's economic power, our agricultural productivity should be a benchmark with those of other countries that are currently classed as the world's economic powers. India needs new and effective technologies that can continuously improve the productivity, profitability and sustainability of our farming systems. Lately, there has been a noticeable change in cropping pattern towards high-value horticulture and commercial crops. In order to make horticulture viable and competitive, the emphasis should be on improving the efficiency of resource use in order to improve relative profitability. Success in horticulture is more technology driven compared to other crops. India is blessed with diverse agro-

climatic conditions that helps to grow all kinds of horticultural crops, almost across the year, in one region of the country or the other. However, the product quality under open-field conditions, especially in the case of high-value flowers and vegetables, is generally below than the domestic and international market standards. Further, no guarantee of consistent production from opened cultivation, because the crop is exposed to a frequently changing environmental factors. Therefore, to meet the demand of quality-conscious consumers, it is vital to increase the productivity and quality of the produce. A revolution in production technology which incorporates market-driven quality parameters with the production system, in addition to ensuring a vertical productivity growth is needed.

The most significant technology in this context is the Controlled Environmental Agriculture (CEA) i.e. Protected Cultivation Technologies (PCT) such as greenhouse, net house, polyhouse and glasshouse. Man has been studying how to grow plants under natural environmental conditions since time immemorial, and mankind has been aware that a wise environmental change could increase crop productivity.

Karnataka has a prominent place on our country's horticultural map. Horticulture accounts for 40% of the state's total income. This accounts for 17.00 per cent of the GDP of the state. Horticulture has taken a front-line position in Karnataka agriculture and the sector is growing at a rapid pace. As a result, there is an increasing trend in the area under horticulture crops. During the year 2017-18, an area of 20.63 lakh hectares was covered by horticultural crops and production was 195.8 lakh tones

(Anonymous, 2019). The total area covered under protected cultivation in our country is approx. 40,000 hectares. The leading states in the area of protected cultivation are Maharashtra, Karnataka, Himachal Pradesh, and North-eastern states, Uttarakhand, Tamilnadu and Punjab (Shwetha et al. 2016). In Chikkaballapur district, the area under polyhouse is 161.75 ha, with 21.00 ha under capsicum, 16.00 ha under chrysanthemum in Chikkaballapur taluk and 28.00 ha under capsicum, 17.00 ha under chrysanthemum in Sidlaghatta taluk.

In India, PCT is more suitable to vegetable crops (such as tomato, brinjal, cauliflower, capsicum, cabbage, chillies, okra, spinach etc.), cut flowers (like chrysanthemum rose, gerbera, carnation, etc.) and nursery for all vegetable crops, because of their short life span. This technology is mainly suitable for commercial farming as it requires large investment in setting up the entire framework.

### 1.1 Principle of Crop Production within Protected Cultivation

A crop's productivity is not only determined by its genetic composition but also by the microclimate that surrounds it. Microclimate crop components are sun, temperature, air composition and the essence of the root and soil medium, tillage, irrigation, application of fertilizer, etc. Also, the structure of the root medium is modified according to requirements. Despite its closed borders, a greenhouse enables regulation of some or more of the micro-climate components. The greenhouse cover allows for a small fraction of sunlight, depending on its transparency. The sunlight falling on the greenhouse is absorbed by the greenhouse crop, floor and other objects. These objects in the greenhouse, in turn emit long wave thermal radiation, for which, the cover material has lower transparency. This phenomenon is generally known as greenhouse effect. It is this natural rise in the greenhouse air temperature under conditions, which is utilized under cold climates to raise the seedlings and to grow successful crops. The same natural phenomenon during summers requires greenhouse cooling to maintain favorable temperatures. Keeping all these in view, the study has been taken up with following specific objectives to study the personal, socio-economical and psychological characteristics of

the horticulture crop growers under protected cultivation.

## 2. MATERIALS AND METHODOLOGY

The study was conducted during 2020 in Chikkaballapur district which comes under eastern dry zone (Zone-V) of Karnataka. In Chikkaballapur district, two taluks i.e. Sidlaghatta and Chikkaballapur taluks were purposefully selected for the study, since this taluk are having more area under protected cultivation technology. In the present investigation, ex-post facto research design was used. This design was considered appropriate, as it is a systematic empirical enquiry for measuring the phenomenon, which has already occurred and is continuing. The researcher has no control on independent variables as their manifestation has already occurred or they are inherent and non-manipulative. The study was conducted in Chikkaballapur district of Karnataka. Out of five taluks, Sidlaghatta and Chikkaballapur are purposively selected for the study since these taluks have more area under protected cultivation compared to other taluks. The total sample size comprises 100 of which, 50 growers (25 Chrysanthemum and 25 Capsicum) were selected randomly from Chikkaballapur taluk. Similarly, 50 growers (25 Chrysanthemum and 25 Capsicum) were selected randomly from Sidlaghatta taluk. The data was collected from the respondents using structured and standardized interview schedule developed for the study. The data collected was tabulated and analyzed using appropriate statistical tools like frequency, percentage, mean, standard deviation etc.

## 3. RESULTS AND DISCUSSION

**Age:** Table 1 shows that sixty-six percent of capsicum growers were in the middle age category, followed by the young age category (24.00%) and the old age category (10.00%). A critical examination of the preceding findings revealed that a significant proportion of capsicum growers are in their forties. The possible reason for the above trend might be the middle-aged capsicum growers were optimistic and ready to take up any new commercial crops to earn profit. Further, the middle-aged growers are enthusiastic, possess more physical vigour and have more work efficiency than older and younger capsicum growers.

**Table 1. Personal, socio-economic and psychological characteristics of capsicum growers under protected cultivation (n=50)**

Sl. no	Characteristics	Category	Capsicum growers		
			f	%	
1	Age	Young (<35 years)	14	24.00	-
		Middle (36-55 years)	27	66.00	
		Old (>55 years)	09	10.00	
2	Education	Illiterate	03	06.00	-
		Primary school	10	20.00	
		High school	17	34.00	
		Pre-University	15	30.00	
		Graduation and above	05	10.00	
3	Land holding	Marginal farmers (<2.5.0 acres)	17	34.00	-
		Small farmers (2.5-5.0 acres)	23	46.00	
		Big farmers (>5.0 acres)	10	20.00	
4	Farming experience	Low (<10 years)	09	18.00	-
		Medium (10-20 years)	35	75.00	
		High (>20 years)	06	2.00	
5	Mass media Exposure	Low (<5.42)	10	20.00	Mean =6.28 S.D=1.73
		Medium (5.42-7.14)	25	50.00	
		High (>7.14)	15	30.00	
6	Scientific orientation	Low (<2.65)	2	24.00	Mean =3.24 S.D=1.17
		Medium (2.65-3.83)	15	30.00	
		High (>3.83)	23	46.00	
7	Achievement motivation	Low (<3.36)	3	26.00	Mean =14.06 S.D=1.41
		Medium (3.36-14.76))	21	42.00	
		High (>14.76)	16	32.00	
8	Extension Participation	Low (<4.22)	16	32.00	Mean =4.94 S.D=1.43
		Medium (4.22-5.66)	23	46.00	
		High (>5.66)	1	22.00	
9	Management orientation	Low (<23.51)	2	24.00	Mean =24.08 S.D=1.14
		Medium (23.51-24.65)	22	44.00	
		High (>24.65)	16	32.00	
10	Accessibility to subsidy	Yes	45	90.00	-
		No	05	10.00	
1	Accessibility to credit	Yes	45	90.00	-
		No	05	10.00	
2	Risk bearing ability	Low (<3.75)	10	20.00	Mean =4.20 S.D=0.90
		Medium (3.75-4.65)	24	48.00	
		High (>4.65)	16	32.00	

*f* - Frequency, %- percentage

**Education:** With regard to level of education, it can be observed from Table 1 that, thirty-four per cent of capsicum growers were educated up to high school followed by 30.00 per cent, 20.00 per cent and 10.00 per cent studied up to college, primary school and graduation respectively. The probable reason for majority of capsicum growers to be educated up to high school and pre university education might be due to lack of facilities for college education in nearby villages, which forces them to travel to cities if at all they

want to pursue college and graduation education.

**Land holding:** The data revealed in Table 1 indicates that 46.00 per cent of the capsicum growers were small famers followed by 34.00 per cent and 20.00 were belonged to marginal and big farmer's category respectively. The reason for possession of small and marginal land holding could be due to fragmentation of land because of separation of families.

**Farming experience:** Table 1 shows that three-fourths (75.00%) of the respondents have medium farming experience, followed by low experience (18.00%) and high experience (2.00%), respectively. One possible explanation is that the majority of capsicum growers are between the ages of 35 and 50 and work in agriculture after finishing their education. As a result, this trend was observed, and a relatively small number of respondents were found in the low farming experience category, owing to the fact that they had only recently begun farming after discontinuing their education.

**Mass media exposure:** According to Table 1, half of the growers (50.00%) belonged to the medium mass media exposure category, followed by the high (30.00%) and low (20.00%) mass media exposure categories. Farmers nowadays have greater access to mass media such as television and radio. They read newspapers, listen to radio programs, and watch television for entertainment and agricultural programs. As a result, the majority of the growers had medium to high media exposure.

**Scientific orientation:** It is apparent from Table 1 that, nearly half of the capsicum growers (46.00 %) had high scientific orientation. While, 30.00 per cent and 24.00 per cent of growers had medium and low scientific orientation respectively. The trend may be due to the fact that, majority of the capsicum growers view the things scientifically with interest and had good knowledge about farming because of their better education, risk bearing ability, farming experience, mass media use and extension system link. All these factors might have contributed for taking keen interest in scientific aspects in their farming activities.

**Achievement motivation:** The results in Table 1 indicates that, more than two-fifth of the growers had medium (42.00 %) achievement motivation followed by 32.00 per cent age and 26.00 per cent had high and low achievement motivation, respectively. Majority of the capsicum growers having medium to high achievement motivation the reason may be due to organizational efforts from all the family members to achieve the determined goal apart from inner urge and drive of the growers.

**Extension participation:** It is clear from Table 1 that, nearly half of the (46.00%) respondents had medium extension participation followed by low

(32.00 %) and high (22.00 %) extension participation, respectively. The pertinent reasons for having medium to low level extension participation was due to lack of free time, they might not find time to attend extension activities, apart from lack of awareness about extension activities organized by line departments. The other probable reasons may be that since they are actively involved in horticulture crop production under protected cultivation, they may not attend programs related to agriculture crop production. Hence, this trend was observed.

**Management orientation:** From the Table 1 it is found that, more than two-fifth of the capsicum growers (44.00 %) had medium level management orientation followed by high (32.00 %) and low (24.00 %) level management orientation respectively. The probable reason for the above trend may be that, growers have interactions with other capsicum growers in the area and also with the field level workers of the horticulture department to manage the production and marketing activities and to re-orient their level of management.

**Accessibility to subsidy:** According to the data in Table 1, the vast majority (90.00%) of capsicum growers had access to the subsidy facility, while the remaining 10% of growers had not applied for the subsidy. The reason for this was that the establishment of a polyhouse required a large initial investment, which was generally out of reach for resource-poor farmers. The study discovered that the majority of growers received financial assistance from the government in the form of subsidies under various programs/schemes aimed at bringing more land under protected cultivation.

**Accessibility to credit:** The data from the Table 1 reveals that 90.00 per cent of the capsicum growers had access to the credit facility and 10.00 per cent of growers have not applied for the credit. The reason was that the establishment of polyhouse required huge initial investment which was practically impossible for farmers establish on their own. It was found by the study that majority of the growers received financial assistance from banks/government sources in the form of credit. Initially farmers have to borne the entire initial investment cost after that subsidy will be provided by various programmes/schemes which are aimed at bringing more area under protected cultivation.

**Table 2. Personal, socio-economic and psychological characteristics of chrysanthemum growers under protected cultivation (n=50)**

Sl. No.	Characteristics	Category	Chrysanthemum growers		
			f	%	
1	Age	Young (<35 years)	12	26.00	
		Middle (36-55 years)	28	58.00	
		Old (>55 years)	10	16.00	
2	Education	Illiterate	05	10.00	
		Primary school	12	24.00	
		High school	16	32.00	
		Pre-University	14	28.00	
		Graduation and above	03	06.00	
3	Land holding	Marginal farmers (<2.5.0 acres)	19	38.00	
		Small farmers (2.5-5.0 acres)	22	44.00	
		Big farmers (>5.0 acres)	09	18.00	
4	Farming experience	Low (<10 years)	06	12.00	
		Medium(10-20 years)	36	72.00	
		High(>20 years)	08	16.00	
5	Mass media exposure	Low (<5.58)	13	26.00	Mean
		Medium (5.58-6.70)	22	44.00	=6.14
		High (>6.70)	15	30.00	S.D=1.13
6	Scientific orientation	Low (<10.84)	11	22.00	Mean
		Medium (10.84-13.60)	17	34.00	=12.22
		High (>13.60)	22	44.00	S.D=2.76
7	Achievement motivation	Low (<13.34)	15	30.00	Mean
		Medium (13.34-14.46)	19	38.00	=13.90
		High (>14.46)	16	32.00	S.D=1.11
8	Extension Participation	Low (<3.98)	14	28.00	Mean
		Medium (3.98-5.58)	24	48.00	=4.78
		High (>5.58)	12	24.00	S.D=1.59
9	Management orientation	Low (<23.24)	14	28.00	Mean
		Medium (23.24-24.52)	21	42.00	=23.88
		High (>24.52)	15	30.00	S.D=1.27
10	Accessibility to subsidy	Yes	49	98.00	
		No	01	2.00	
11	Accessibility to credit	Yes	49	98.00	
		No	01	2.00	
12	Risk bearing ability	Low (<3.69)	12	24.00	Mean
		Medium (3.69-4.43)	23	46.00	=4.06
		High (>4.43)	15	30.00	S.D=0.74

**Risk bearing ability :** The findings in Table 1 indicates that nearly half (48.00 %) of the capsicum growers belonged to medium risk bearing ability followed by high (32.00 %) and low (20.00 %) risk bearing ability, respectively. It concludes that, the capsicum growers take moderate risk in taking up any innovations. Cultivation under protected condition requires initial investment, skill and experience of the growers, for this, growers have to take risk in taking up such activities. This may be the probable reason for growers

having medium to high level risk bearing ability.

**Age:** It is observed from Table 2 that, nearly three-fifth of the chrysanthemum growers (58.00 %) come under middle age category followed by young age category (26.00 %) and old age category (16.00 %). A critical observation of the above findings indicated that a considerable per cent of the chrysanthemum growers are of middle age. The possible reason for the above trend might be the middle-aged chrysanthemum

growers were optimistic and ready to take up cultivation of commercial crops to earn profit. Further, the middle-aged growers are enthusiastic, possess more physical vigour and have more work efficiency than older and younger chrysanthemum growers.

**Education:** With regard to level of education, it can be observed from Table 2 that, 32.00 per cent of chrysanthemum growers were educated up to high school followed by 28.00 per cent, 24.00 per cent 10.00 per cent and 06.00 per cent studied college, primary school, illiterate and graduation respectively. The probable reasons for majority of chrysanthemum growers educated up to high school and pre university education might be due to lack of facilities for college education in nearby villages, which forces them to travel to cities if at all they want to pursue college and graduation education and lack of interest in pursuing further education.

**Land holding:** The data revealed in Table 2 indicates that 44.00 per cent of the chrysanthemum growers were small famers followed by 38.00 per cent and 18.00 were belonged to marginal and big farmers respectively. The reason for possession of small and marginal land holding could be due to fragmentation of land because of separation of families.

**Farming experience:** It is noticed from Table 2 that, 72.00 per cent of the respondents come under medium farming experience category followed by high experience (16.00 %) and low experience category (2.00 %), respectively. This might be due to majority of the chrysanthemum growers belonged to medium age group of 35 to 50 years and are practicing farming after discontinuing their education. Hence, this trend was observed and relatively less numbers of respondents were also found in low farming experience category because they may have recently started the farming profession after discontinuing their education.

**Mass media exposure:** It is evident from the Table 2 that, more than two-fifth (44.00 %) of chrysanthemum growers belonged to medium mass media exposure category followed by high (30.00 %) and low (26.00 %) mass media exposure category, respectively. Farmers in present days have more accessibility to mass media such as television and radio. Further they have the habit of reading newspaper and listening to radio programs and watching

television for entertainment and agricultural programs. Hence, majority of the growers had medium to high mass media exposure.

**Scientific orientation:** It is apparent from Table 2 that, 44.00 per cent of chrysanthemum growers had high scientific orientation. While 34.00 per cent and 22.00 per cent had medium and low scientific orientation, respectively. The trend may be due to the fact that, majority of the chrysanthemum growers view the things scientifically with interest and had good knowledge about farming because of their better education, risk bearing ability, farming experience, mass media use and extension system link. All these factors might have contributed for taking keen interest in scientific aspects in their farming activities

**Achievement motivation:** The results in Table 2 indicate that, 38.00 per cent of the chrysanthemum growers had medium achievement motivation followed by 32.00 per cent and 30.00 per cent had high and low achievement motivation, respectively. Majority of the chrysanthemum growers having medium to high achievement motivation, the reason may be due to organizational efforts from all the family members to achieve the determined goal apart from inner urge and drive of the growers.

**Extension participation:** Table 2 shows that 48.00 of the respondents had medium extension participation, followed by low (28.00%) and high (24.00%) extension participation. The pertinent reasons for having medium to low level of extension participation was due to lack of free time, to attend extension activities and lack of awareness about extension activities organized by line departments. Another possible reason is that they do not attend agriculture crop production programs because they are actively involved in horticulture crop production under protected cultivation. As a result, this pattern was discovered.

**Management orientation:** From the Table 2 it is found that, more than two-fifth of the chrysanthemum growers (42.00 %) had medium level management orientation followed by high (30.00 %) and low (28.00 %) level management orientation, respectively. The probable reason for the above trend may be that, growers have interactions with progressive chrysanthemum growers in the area and also with the field level workers of the horticulture department to manage the production and marketing activities and to re-orient their level of management.

**Accessibility to subsidy:** The data from the Table 2 reveals that almost all the chrysanthemum growers (98.00 %) had access to subsidy facility. The reason was that establishment of polyhouse required huge initial investment which was generally beyond the limits of resource poor farmers to establish on their own. It was found that majority of the growers received financial assistance from government sources in the form of subsidies under various programmes/schemes like National Horticultural Mission aimed at bringing more area under protected cultivation.

**Accessibility to credit:** The data from the Table 2 reveals that a great majority of the (98.00 %) chrysanthemum growers had access to the credit facility. The reason was that establishment of polyhouse required huge initial investment which was practically impossible for farmers to establish on their own. It was found that majority of the growers received financial assistance from

banks/government sources in the form of credit along with subsidy. Initially farmers have to borne the entire initial investment cost after that subsidy will be provided by various programmes/schemes which are aimed at bringing more area under protected cultivation.

**Risk bearing ability:** The findings in Table 2 indicates that, 46.00 per cent of the chrysanthemum growers belonged to medium risk bearing ability followed by high (30.00 %) and low (24.00 %) risk orientation category, respectively. It concludes that, the chrysanthemum growers take moderate risk in taking up any innovations. Cultivation under protected condition requires initial investment, skill and experience of the growers, for this, growers have to take risk in taking up such activities. This may be the probable reason for growers having medium to high level risk bearing ability. The results are in conformity with the findings of Kolgane [1].

**Table 3. Personal, socio-economic and psychological characteristics of horticulture crop growers under protected cultivation (n=100)**

Sl. no	Characteristics	Category	Horticulture crop growers		
			f	%	
1	Age	Young (<35 years)	26	26.00	
		Middle (36-55 years)	55	55.00	
		Old (>55 years)	19	19.00	
2	Education	Illiterate	08	08.00	
		Primary school	22	22.00	
		High school	33	33.00	
		PUC	29	29.00	
		Graduation and above	08	08.00	
3	Land holding	Marginal farmers (<2.5.0 acres)	36	36.00	
		Small farmers (2.5-5.0 acres)	45	45.00	Mean=3.76
		Big farmers(>5.0 acres)	19	19.00	S.D=1.68
4	Farming experience	Low (<10 years)	2	15.00	
		Medium(10-20 years)	71	71.00	
		High(>20 years)	17	14.00	
5	Mass media exposure	Low (<5.48)	23	23.00	
		Medium (5.48-6.94)	43	43.00	Mean=6.21
		High (>6.94)	34	34.00	S.D=1.45
6	Scientific orientation	Low (<1.64)	16	16.00	
		Medium (1.18-3.20)	39	39.00	Mean=2.73
		High (>3.82)	45	45.00	S.D=2.17
7	Achievement motivation	Low (<3.35)	28	28.00	
		Medium(3.35-14.61)	40	40.00	Mean=3.98
		High (>14.61)	32	32.00	S.D=1.26
8	Extension Participation	Low (<4.10)	37	37.00	
		Medium (4.10-5.62)	40	40.00	Mean=4.86
		High (>5.62)	23	23.00	S.D=1.51



Sl. no	Characteristics	Category	Horticulture crop growers		
			f	%	
9	Management orientation	Low (<23.38)	26	26.00	Mean=23.98 S.D=1.21
		Medium (23.38-24.58)	43	43.00	
		High (>24.58)	31	31.00	
10	Accessibility to subsidy	Yes	94	94.00	
		No	06	06.00	
1	Accessibility to credit	Yes	94	94.00	
		No	06	06.00	
2	Risk bearing ability	Low (<3.72)	22	22.00	Mean=4.3 S.D=0.82
		Medium (3.72-4.54)	47	47.00	
		High (>4.54)	31	31.00	

**Age:** Age is an important factor as it reveals the maturity of an individual to take decisions for achieving his needs. Results in Table 3 highlights that more than half of the respondents (55.00%) were middle age followed by 26.00 per cent young aged and 19.00 per cent of them were old. Middle aged farmers work more efficiently than older and younger ones. Further, individuals of 36 to 55 years of age have more family responsibility than the younger ones this might be the reason for above findings. Further, the middle-aged growers are enthusiastic optimistic and possess more physical vigour and are ready to take up risk to earn profit. The results are in conformity with the results of Sumana (2017).

**Education:** Education is another important factor that influences the adoption behavior of individuals. Education level of capsicum and chrysanthemum growers could be understood from Table 3. It was found that 33.00 per cent of the respondents had high school education followed by Pre university education (29.00 %), primary school (22.00 %) and 8.00 per cent are illiterate as well as studied up to graduation and above. The results could be attributed to the availability of free basic education and the educational facility in the village. Few of them opted higher education reflecting on their affordability and interest to learn more and gain good knowledge. The distance of higher study centres from the village might have contributed for only few being educated above college. Similar findings were reported by Sharma [2] and Mubeena [3].

**Land holding:** A glance at Table 3 indicates that, nearly half of the respondents (45.00%) were small farmers followed by marginal (36.00%) and big (19.00 %) farmers. The reason for possession of small and marginal land

holding could be due to fragmentation of land because of separation of families and preference for nuclear family. Per capita land availability for farming in the study area is about only 0.016 ha availability. The findings are in confirmation with the studies of Nagesh [4].

**Farming experience:** Farming experience of the growers could be glanced from Table 3. It was found that nearly three-fourth of the respondents (71.00 %) belonged to medium farming experience category followed by 15.00 per cent of respondents had low level of farming experience and 14.00 per cent of respondents had high level of farming experience. Farming experience mainly depends upon age of the farmer. Majority of horticulture crop growers belonged to medium age group of 35 to 50 years and are practicing farming after discontinuing their education. Hence, this trend is observed and relatively less numbers of respondents were also found in low farming experience category because they were recently started the farming profession after discontinuing their education. The results are in conformity with the results of Wanole [5].

**Mass media exposure:** It is clear from the Table 3 that about more than two-fifth of the horticulture crop growers (43.00%) belonged to medium mass media exposure category followed by 34.00 per cent and 23.00 per cent of farmers belonged to high and low mass media exposure category, respectively. Farmers in present days have more accessibility to mass media such as television and radio. They have the habit of reading newspaper and listening to radio programs and watching television for entertainment and agricultural programs. Hence, majority of the growers had medium to high mass media exposure. The results are in line with the findings of Nayak [6].

**Scientific orientation:** A glance at Table 3 observed that nearly half of the respondents (45.00 %) were found in high scientific orientation category followed by 39.00 per cent in medium and 16.00 per cent in low scientific orientation category. The trend may be due to the fact that, majority of the growers view the things scientifically with interest and had good knowledge about farming because of their better education, risk bearing ability, farming experience, mass media use and extension system link. All these factors might have contributed for taking keen interest in protected cultivation. The similar findings were reported by Shreekanth and Jaghirdar [7].

**Achievement motivation :** The data presented in Table 3 reveals that two-fifth of the respondents (40.00 %) had medium level of achievement motivation, whereas, 32.00 per cent and 28.00 per cent of them had high and low level of achievement motivation respectively. This may be due as achievement motivation is more of a psychological variable which differs from individual to individual. It is assumed that achievement motivation forces the individual towards reaching predetermined goals, which an individual set for himself. Higher the association with the individual, higher will be his efforts. This can be attributed to the social status of a respondent, who feels to keep greater goals and organizational efforts from all the family members to achieve the determined goal. The findings are in accordance with the studies conducted by Patel [8].

**Extension participation:** The keen observation of Table 3, revealed the extent of extension participation of the farmers. In total, two-fifth of the respondents belonged to medium category (40.00 %) followed by low (37.00 %) and high (23.00 %) level of extension participation. The pertinent reasons for having medium level of extension participation was activities conducted by the concerned department's either less frequently or with less priority. The lack of initiation or interest on part of the respondents could also be the reason for low participation. Demonstrations are usually laid in farmer's field and many of them might have participated in it. Popularity, specified time and place of the activities conducted by concerned department's increases the participation of the farmers. The above findings were in accordance with the findings of study conducted by Shalini [9].

**Management orientation:** Table 3 presents the management orientation of horticulture crop growers. The results from the data indicated that more than two-fifth of the respondents (43.00 %) were belonged to medium management orientation category followed by high (31.00 %) and low (26.00 %) management orientation category. The probable reason for the above trend may be that, growers have interactions with other growers in the area and also with the field level functionaries of the horticulture department to manage the production and marketing activities which are most important management orientation activities. These results are in check with that of Kolgane et al. [1].

**Accessibility to subsidy:** The data from the Table 3 reveals that 94.00 per cent of the respondents had access to the subsidy and remaining 6.00 per cent did not have access to subsidy. The reason was that establishment of polyhouse required huge initial investment which was generally beyond limits of resource poor farmers to establish on their own. It was found that majority of the growers received financial assistance from Government sources in the form of subsidies under various programmes/schemes aimed at bringing more area under protected cultivation. These results are in line with that of Itigi (2015).

**Accessibility to credit:** The data from the Table 3 reveals that 94.00 per cent of the respondents had received the credit and remaining 6.00 per cent did not have access to the credit. The reason was that establishment of polyhouse required huge initial investment which was practically impossible for farmers to establish on their own. It was found that majority of the growers received financial assistance from banks/government sources in the form of credit. Initially farmers have to borne the entire initial investment cost after that subsidy will be provided by various programmes/schemes which are aimed at bringing more area under protected cultivation. These results are in conformity with that of Sudha Narayanan [10].

**Risk bearing ability:** Table 3 reveals that nearly half of the farmers (47.00 %) were belonged to medium level of risk bearing ability category followed by 31.00 per cent of the respondents had high level of risk bearing ability category and 22.00 per cent of the farmers had low level of risk bearing ability category. It concludes that, the growers take moderate risk in taking up any innovations. Cultivation under protected condition

requires initial investment, knowledge, skill and experience of the growers, for this, growers have to take risk in taking up such activities. This may be the probable reason for growers having medium to high level risk bearing ability. The results are in conformity with the findings of Sharma et al. [2].

#### 4. CONCLUSION

It can be concluded from the results of the study that, more than half of the horticulture crop growers were comes under middle age category, nearly one-third of growers were educated up to high school, more than two-fifth of the growers were small farmers, nearly one-fourth of the growers belonged to medium experience category, more than two-fifth of growers belonged to medium mass media exposure category. More than two-fifth of horticulture crop growers had high scientific orientation. Two-fifth of the growers had medium achievement motivation. two-fifth of the horticulture crop growers had medium extension participation, more than two-fifth of the growers had medium level management orientation, majority of the growers were accessibility to credit and subsidy and nearly half of the growers belonged to medium risk bearing ability.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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