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Perception of Capsicum Growers towards Protected Cultivation in Karnataka

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Abstract

The present study was conducted in Chikkaballapura and Kolar districts of Karnataka state during 2024. The perception scale was developed and found to be highly reliable and valid consisting of 38 statements. The data was collected from 50 capsicum growers growing capsicum under protected cultivation using a pre-tested interview schedule. Ex-post facto research design was employed in the present study. The results revealed that more than one-third (40.00%) of capsicum growers had good perception towards protected cultivation followed by better (34.00%) and poor (26.00%) perception. The F calculated value of 79.89 revealed highly significant difference between the different perception categories. The correlation test showed that 14 out of 17 independent variables of capsicum growers exhibited significant relationship with their perception towards protected cultivation, where in, extension participation, accessibility to subsidy and innovative proneness of capsicum growers had highly significant relationship with their perception towards protected cultivation. Further, all the 17 profile characteristics of capsicum growers contributed to the tune of 71.60 per cent in developing perception towards protected cultivation. The primary strengths, weaknesses, opportunities and challenges of protected cultivation, as perceived by capsicum growers, include high input use efficiency as a strength, the high initial and operational costs of protected structures as a weakness, the potential to generate marketable surplus and surplus for export as an opportunity and the inefficiency in farm management, which hinders farmers from fully benefiting from globalization and trade liberalization, as a challenge.

Keywords : Protected cultivation, Capsicum-growers, Perception, SWOC

Climate change has disrupted weather patterns, increasing temperatures, unpredictable rainfall and drought, which have negatively impacted traditional open-field cultivation. Farmers face difficulties in maintaining consistent yields, affecting livelihoods and food supply. Protected cultivation offers a solution by creating a favorable microclimate for crops, mitigating climate risks. It is a capital-intensive, high-tech method compared to traditional farming, allowing farmers to grow crops year-round and achieve higher returns. Studies have shown that protected cultivation can significantly increase yields, making it a sustainable, profitable and efficient alternative (Mehta, 2020). Globally, 115 countries practice commercial protected horticulture, covering 623,302 hectares with China leading at 2.76 million hectares. In India, protected cultivation has grown to 50,000 hectares over two decades, supported by government initiatives and economic reforms. India's horticulture sector has advanced with vegetables occupying 27.74 million hectares, yielding 341.63 million metric tonnes annually (Anonymous, 2022). However, India faces challenges in meeting domestic demand despite increased production. Protected cultivation offers a modern solution to address land constraints and rising consumer demand, especially

for vegetables and flowers with research showing high yield potential in crops like tomatoes and capsicum (Balakrishna and Shankar, 2021). Karnataka, a major horticultural state, has established nearly 10,000 polyhouses, significantly boosting vegetable and flower production. The government supports protected cultivation through programs like National Horticulture Mission (NHM), providing subsidies for setting up structures and purchasing planting materials. As a result, the area under protected cultivation in India grew by 14,136 hectares between 2005 and 2018 (Prakash *et al.,* 2019). With this backdrop, the present study was carried out with the following specific objectives:

1. To analyze the perception of capsicum growers towards protected cultivation
2. To find out the relationship and extent of contribution of profile characteristics of capsicum growers on the perception towards protected cultivation
3. To know the strengths, weaknesses, opportunities and challenges of protected cultivation as perceived by capsicum growers

Methodology

The present study was conducted in Chikkaballapura and Kolar districts of Karnataka state during 2024. The data was collected randomly from 50 capsicum growers using a pre-tested interview schedule. Ex-post facto research design was employed in the present study. The perception of capsicum growers towards protected cultivation was considered as dependent variable for the study. Perception of capsicum growers towards protected cultivation is operationally defined in the present study 'as the extent of mental awareness of capsicum growers on protected cultivation encompassing its influence on improvement in crop yield, produce quality, economic viability, resource efficiency, market demand and consumer preference and its role in skill and social development of growers'. The method of summated rating scale suggested by Likert (1932) and Edwards (1969) were followed in the development of the perception scale. The developed perception scale was found to be highly reliable (0.770) and valid (0.870). The developed perception scale consists of 38 statements for determining the perception of capsicum growers towards protected cultivation. The response was collected on a five-point continuum, namely, strongly agree, agree, undecided, disagree and strongly disagree with assigned score of 5, 4, 3, 2 and 1, respectively. The perception score of a respondent was calculated by adding up the scores obtained by him/her on all the 38 statements. The perception score of the scale ranges from a minimum of 38 to a maximum of 190 score. Based on the mean (160.16) and half standard deviation (2.67), the respondents was categorized into three perception categories, *viz.*, poor, good and better. Higher score on this scale indicates that the respondent has better perception towards protected cultivation and the lower perception score indicates that the respondent has poor perception towards protected cultivation.

Information regarding 17 profile characteristics (independent variables) of capsicum growers were collected using a structured interview schedule with suitable scales. The SWOC analysis of protected cultivation was done on the basis of data collected by using the 24 statements under following four components *viz.,* strengths (6 statements), weaknesses (6 statements) opportunities (6 statements) and challenges (6 statements). The growers were asked to indicate agree or disagree for all the statements framed under each component. A score of 'one' was assigned for agree response and 'zero' for disagree. The results were expressed in terms of frequency and percentages. The data collected were scored, tabulated and analyzed using frequency, mean, percentage, correlation test and multiple regression analysis.

Results and Discussion

Perception of Capsicum Growers towards Protected Cultivation

The results in Table 1 reveal the data on the perception of capsicum growers towards protected cultivation.

TABLE 1

Perception of Capsicum growers towards protected cultivation

(n= 50)

Perception statements	Perception score	Rank
Perception towards improvement in crop yield		
Cultivating vegetables and flowers under protected cultivation has the potential to significantly increase crop yields	244	I
The protective structures shields crops from adverse weather conditions, minimizing yield losses and ensuring consistent production	240	II
Protected cultivation allows farmers to extend the growing season and enables multiple harvests	221	III
Protected cultivation technology optimizes factors like light, temperature, and irrigation	212	IV
The ability to monitor and manage growing conditions closely in protected cultivation helps farmers to identify and address crop stress factors promptly	183	V
Protective structures offer protection against pests and diseases	159	VI
Perception towards quality of crop produce		
Protected cultivation technology ensures higher crop quality by minimizing exposure to external contaminants, pollutants and pests	243	I
Protected cultivation techniques like shade nets and greenhouse structures protect crops from excessive sunlight, preventing sunburn and maintaining the desirable color quality of vegetables and flowers	238	II
Protected cultivation ensures the ability to harvest crops at the peak of maturity with optimal flavor, nutritional content and overall quality of vegetables and flowers	228	III
The controlled environment within protected cultivation helps to maintain flavor, texture and appearance of vegetables and flowers	225	IV
Protected cultivation minimizes post-harvest losses by providing controlled environment	203	V
By reducing reliance on synthetic pesticides, protected cultivation allows farmers to produce crops with lower chemical residues.	112	VI
Perception towards economic viability		
Protected cultivation can lead to higher profit margins due to increased yields, better product quality and reduced crop losses	250	I
Protected cultivation can provide more stable and predictable income	247	II
Protected cultivation offers farmers the opportunity to engage in contract farming or establish direct partnerships with retailers or wholesalers	227	III
Protected cultivation requires high initial investment cost, therefore careful financial planning and access to capital is needed.	217	IV
Protected cultivation can enhance market competitiveness even during off-season or market fluctuations	192	V
Maintaining and operating protected structures requires substantial expenses for heating, cooling, ventilation and maintenance	185	VI
Protected cultivation minimizes the need for expensive inputs like pesticides and fertilizers	87	VII
Perception towards Efficient Resource Management		
It reduces the need for manual weed control, as enclosed environments limit weed intrusion and competition	246	I
Protected cultivation optimizes water use efficiency through technologies like drip irrigation, reducing water consumption and preserving water resources	232	II
Protected structures can be designed for optimized airflow and ventilation, improving energy efficiency and minimizing temperature fluctuations	231	III
Protected cultivation promotes efficient land use by maximizing production in limited space and reducing the need for land expansion	213	IV
It offers the potential for automation and mechanization, reducing labor requirements and improves operational efficiency	184	V

Continued...

Table 1 Continued...

Perception statements	Perception score	Rank
It promotes efficient pest and disease management practices and minimizes chemical residues	119	VI
Perception towards Market Demand and Consumer Preference		
Protected cultivation enables farmers to produce export quality products catering to the standards of overseas markets	244	I
Protected cultivation technology allows farmers to meet the increasing market demand for year-round availability of fresh and high-quality produce	232	II
Protected cultivation provides a consistent and reliable supply of vegetables and flowers that helps the farmers to establish strong and long-term relationships with wholesalers, retailers and other buyers	231	III
Protected cultivation enables farmers to cater to specific consumer preferences by offering a wide range of specialty or exotic vegetables and flowers that may not be easily grown in traditional open fields	223	IV
Protected cultivation enables growers to meet the increasing demand for locally grown, fresh produce and flowers	215	V
It facilitates the cultivation of out-of-season crops and enables growers to capture premium prices when supply is limited	206	VI
Protected cultivation provides farmers with opportunities for market diversification, allowing them to tap into multiple distribution channels such as restaurants, hotels, specialty stores and online platforms	197	VII
Perception towards Skill and Social development		
Practicing successful protected cultivation improves the social status and recognition of the farmer in the community	247	I
Protected cultivation technology empowers farmers by providing them with a sustainable and economically viable livelihood	238	II
Growers need specialized knowledge and skills to effectively manage the complex environmental conditions within protected structures	234	III
Adequate training and education on protected cultivation practices is limited, making it challenging for growers to acquire necessary skills	209	IV
Protected cultivation offers great scope for entrepreneurship development among the farmers leading to development of the society	203	V
Protected cultivation may require skilled labour for tasks such as manual pollination and maintaining optimal growing conditions	191	VI

Perception towards Improvement in Crop Yield

Capsicum growers perceived that protected cultivation significantly enhances crop yields. The statement 'Cultivating vegetables and flowers under protected cultivation has the potential to significantly increase crop yields' (score: 244) was ranked first, indicating the growers' strong belief in the technology's ability to boost productivity. The statement, 'The protective structures shield crops from adverse weather conditions, minimizing yield losses and ensuring consistent production' (score: 240) ranked second emphasizes how protected cultivation provides consistent yields by reducing the negative impact of weather. 'Protected cultivation allows farmers to extend the growing season and enables multiple harvests' (score: 221) ranked third, reflecting the growers' appreciation for increased crop cycles. Meanwhile, 'Protected cultivation technology optimizes factors like light, temperature and irrigation' (score: 212) ranked fourth, showing that although growers see value in controlling these factors, they prioritize yield and weather protection more. The ability to 'monitor and manage growing conditions closely, helping to address crop stress factors promptly' (score: 183) ranked fifth and 'Protective structures offer protection against pests and diseases' (score: 159) ranked sixth, reflecting less emphasis on pest management and more focus on overall yield and environmental protection.

Perception towards Crop Produce Quality

Capsicum growers perceived protected cultivation as highly effective in improving crop quality. The

statement 'Protected cultivation technology ensures higher crop quality by minimizing exposure to external contaminants, pollutants and pests' (score: 243) ranked first, showing that the growers value the cleanliness and safety of their produce. 'Protected cultivation techniques like shade nets and greenhouse structures protect crops from excessive sunlight, preventing sunburn and maintaining the desirable color and quality of vegetables and flowers' (score: 238) ranked second, highlighting the importance of physical protection for maintaining quality. The ability of protected cultivation to 'ensure the ability to harvest crops at the peak of maturity with optimal flavor, nutritional content and overall quality' (score: 228) ranked third. Maintaining the 'flavor, texture and appearance of vegetables and flowers' (score: 225) ranked fourth, illustrating growers' concern with the sensory quality of the produce. The controlled environment's role in 'minimizing post-harvest losses' (score: 203) was ranked fifth, showing that while growers value it, other factors take precedence. Finally, 'By reducing reliance on synthetic pesticides, protected cultivation allows farmers to produce crops with lower chemical residues' (score: 112) ranked sixth, indicating that the growers consider pesticide reduction as a benefit but not their primary concern.

Perception towards Economic Viability

Economic viability is a key driver for adopting protected cultivation among capsicum growers. The statement, 'Protected cultivation can lead to higher profit margins due to increased yields, better product quality and reduced crop losses' (score: 250) ranked first, reflecting the growers' perception of enhanced profitability. The statement, 'Protected cultivation can provide more stable and predictable income' (score: 247) ranked second, which reinforces the idea that technology brings financial stability. 'Protected cultivation offers farmers the opportunity to engage in contract farming or establish direct partnerships with retailers or wholesalers' (score: 227), ranked third, which demonstrates growers' interest in leveraging the market opportunities provided by protected cultivation. However, the financial challenges are also evident, with the statement 'Protected cultivation requires high initial investment cost, therefore careful financial planning and access to capital is needed' (score: 217) ranked fourth, highlighting the capital-intensive nature of the technology. 'Protected cultivation can enhance market competitiveness even during off-seasons or market fluctuations' (score: 192) ranked fifth, showing that growers see it as a way to remain competitive year-round. The statement, "Maintaining and operating protected structures requires substantial expenses for heating, cooling, ventilation and maintenance' (score: 185) ranked sixth, which highlights the ongoing operational costs. Finally, 'Protected cultivation minimizes the need for expensive inputs like pesticides and fertilizers' (score: 87) ranked last, indicating that cost reduction in inputs like fertilizers is of less concern compared to other economic factors.

Perception towards Efficient Resource Management

Capsicum growers viewed protected cultivation as an effective way to manage resources efficiently. Growers place great value on the fact that 'Protected cultivation reduces the need for manual weed control, as enclosed environments limit weed intrusion and competition' (score: 246), ranked first'. Protected cultivation optimizes water use efficiency through technologies like drip irrigation, reducing water consumption and preserving water resources' (score: 232) was ranked second, demonstrating the importance of water conservation. Additionally, 'Protected structures can be designed for optimized airflow and ventilation, improving energy efficiency and minimizing temperature fluctuations' (score: 231), ranked third, which highlights the role of structural design in energy management. The statement, 'Protected cultivation promotes efficient land use by maximizing production in limited space, reducing the need for land expansion' (score: 213) ranked fourth, which shows how growers value the land-use efficiency of protected cultivation. 'It offers the potential for automation and mechanization, reducing labor requirements and improving operational efficiency' (score: 184) ranked fifth, which reflects growers' recognition of labor savings through

mechanization.' It promotes efficient pest and disease management practices and minimizes chemical residues' (score: 119) ranked sixth since minimizing chemical residues are perceived less critically by the capsicum growers.

Perception towards Market Demand and Consumer Preference

The ability to meet market demands is a crucial benefit of protected cultivation for capsicum growers. The statement, 'Protected cultivation enables farmers to produce export quality products catering to the standards of overseas markets' (score: 244) ranked first, which reflects the growers' belief in producing high-quality products for export markets. Additionally, 'Protected cultivation technology allows farmers to meet the increasing market demand for year-round availability of fresh and high-quality produce' (score: 232), ranked second, shows the growers' focus on consistent supply. The ability to establish long-term relationships with buyers is highlighted by the third-ranked statement, 'Protected cultivation provides a consistent and reliable supply of vegetables and flowers that helps the farmers to establish strong and long-term relationships with wholesalers, retailers and other buyers' (score: 231). However, growers also value market diversification, as seen in the fourth-ranked statement, 'Protected cultivation enables farmers to cater to specific consumer preferences by offering a wide range of specialty or exotic vegetables and flowers' (score: 223). Although 'Protected cultivation enables growers to meet the increasing demand for locally grown, fresh produce and flowers' (score: 215) was ranked fifth, it is still seen as important for responding to local preferences. The statement, 'It facilitates the cultivation of out-of-season crops and enables growers to capture premium prices when supply is limited' (score: 206) ranked sixth, indicates that even though it is valuable, it is not the primary market advantage. Finally, 'Protected cultivation provides farmers with opportunities for market diversification, allowing them to tap into multiple distribution channels such as restaurants, hotels, specialty stores and online platforms' (score: 197) was ranked seventh, reflecting that diversification is seen as a lower priority.

Perception towards Skill and Social Development

Capsicum growers perceived protected cultivation as having a strong impact on their social standing and skills development. The statement 'Practicing successful protected cultivation improves the social status and recognition of the farmer in the community' (score: 247) was ranked first, showing how important social recognition is for growers to adopt the technology. The second-ranked statement, 'Protected cultivation technology empowers farmers by providing them with a sustainable and economically viable livelihood' (score: 238), reflects the broader socio-economic benefits. 'Growers need specialized knowledge and skills to effectively manage the complex environmental conditions within protected structures' (score: 234), ranked third, which the skill development required for protected cultivation. However, the lack of training opportunities is also a concern, as seen in the fourth-ranked statement, 'Adequate training and education on protected cultivation practices is limited, making it challenging for growers to acquire necessary skills' (score: 209). The fifth-ranked statement, 'Protected cultivation offers great scope for entrepreneurship development among the farmers, leading to the development of the society' (score: 203), points to the entrepreneurial potential of technology. Lastly, the statement 'Protected cultivation may require skilled labor for tasks such as manual pollination and maintaining optimal growing conditions' (score: 191), ranked sixth, which the recognition of the labor challenges involved.

Overall Perception of Capsicum Growers towards Protected Cultivation

The results in Table 2 reveals that nearly three-fourth (74.00%) of capsicum growers possessed good to better level of perception towards protected cultivation, while 26 per cent of the total sample, indicated a poor perception towards protected cultivation. The F-calculated value of 79.89, along with the P-value of <0.001, demonstrates that there is a statistically significant difference in the perception levels of capsicum growers towards protected cultivation at the one per cent level of probability.

Table 2

Overall perception of Capsicum growers towards protected cultivation

(n=50)

Perception categories	Capsicum growers		Mean	Standard deviation	F- Cal value	P- value
	Number	Per cent				
Poor (< 148.17 score)	13	26.00	160.16	23.98	79.89 **	<0.001
Good (148.17 to 172.15 score)	20	40.00				
Better (>172.15score)	17	34.00				
Total	50	100.00				

**= Significant at 1% level of probability

A significant portion of capsicum growers exhibit positive perceptions towards protected cultivation. The largest group, 40 per cent, falls into the 'good perception' category. These farmers recognize the benefits of protected cultivation, such as improved yields and resource efficiency, but may still encounter challenges that prevent them from fully utilizing its potential. Additionally, 34 per cent belong to the 'better perception' category. These farmers not only understand the advantages of protected cultivation but have likely adopted it successfully, integrating the technology into their farming practices for optimal productivity and sustainability. Together, these groups highlight a strong and growing appreciation for protected cultivation among the capsicum growers. The present findings are in line with findings of the study conducted by Preethi *et al.* (2017) and Gopika and Lalitha (2018).

Relationship between Profile Characteristics and Perception of Capsicum Growers towards Protected Cultivation

The results in Table 3 reveals that the variables age, family size and land holding of capsicum growers had positive but non-significant relationship with their perception towards protected cultivation. Variables like education, farming experience, mass media exposure, scientific orientation, cosmopoliteness, economic motivation, achievement motivation, extension contact, management orientation, accessibility to credit and risk bearing ability had significant relationship at five per cent level and the variables such as extension participation, accessibility to subsidy and innovative proneness had positive and highly significant relationship at one per cent level with their perception towards protected cultivation.

Table 3

Relationship between profile characteristics and perception of Capsicum growers towards protected cultivation

(n=50)

Sl. No.	Profile characteristics	Correlation coefficient ('r' values)
X_1	Age	0.139 NS
X_2	Education	0.267 *
X_3	Family size	0.194 NS
X_4	Land holding	0.177 NS
X_5	Farming experience	0.247 *
X_6	Mass media exposure	0.274 *
X_7	Scientific Orientation	0.287 *
X_8	Cosmopoliteness	0.246 *
X_9	Economic motivation	0.277 *
X_{10}	Achievement motivation	0.230 *
X_{11}	Extension contact	0.304 *
X_{12}	Extension participation	0.386 **
X_{13}	Management orientation	0.263 *
X_{14}	Accessibility to subsidy	0.364 **
X_{15}	Accessibility to credit	0.229 *
X_{16}	Innovative proneness	0.397 **
X_{17}	Risk bearing ability	0.296 *

NS = Non-significant; *= Significant at 5%;
**= Significant at 1%

For every unit increase in education, farming experience, mass media exposure, scientific orientation, cosmopoliteness, economic motivation, achievement motivation, extension contact, management orientation, accessibility to credit, risk bearing ability, extension participation, accessibility to subsidy and innovative proneness of capsicum growers, there will be an increase in the perception level towards protected cultivation. The present findings are in line with the earlier reports of Darshan *et al*. (2019) and Meghajit Sharma Shijagurumayum *et al*. (2022).

The interpretations for the profile characteristics having significant to highly significant relationship with the perception level is explained in the ensuing paragraphs.

Education and Perception Level : Education had a significant positive correlation (r = 0.267*), indicating that more educated farmers tend to have a more favorable perception of protected cultivation. Education provides farmers with a deeper understanding of the complexities and advantages of advanced farming methods, which likely contributes to their positive outlook.

Farming Experience and Perception Level : Farming experience showed a significant positive correlation (r = 0.247*) with perception level. More experienced farmers tend to have a better perception of protected cultivation, likely because they have witnessed the evolution of farming practices and are more open to adopting innovations that promise higher efficiency and yields.

Mass Media Exposure and Perception Level : The significant correlation (r = 0.274*), indicates that farmers who are more exposed to mass media tend to have a more positive perception of protected cultivation. This is because of the reason that mass media serves as a vital source of information about modern farming techniques, providing knowledge that enhances the perception of such practices.

Scientific Orientation and Perception Level : A significant positive relationship (r = 0.287*) suggests that the farmers with a stronger inclination towards scientific approaches are more likely to appreciate the benefits of protected cultivation. Their scientific mindset enables them to grasp the technical aspects and potential advantages of technology.

Cosmopoliteness and perception level: The significant correlation (r = 0.246*) implies that the farmers with greater exposure to external ideas and interactions with diverse networks tend to have a better perception of protected cultivation. Their broader cosmo politeness allows them to understand the relevance of innovative farming techniques in the global market.

Economic Motivation and Perception Level : The significant positive correlation (r = 0.277*) shows that the economically motivated farmers are more likely to perceive protected cultivation favorably. These farmers view it as an opportunity to increase profitability and efficiency, thus aligning with their financial goals.

Achievement Motivation and Perception Level : The significant correlation (r = 0.230*), suggests that the farmers who are highly motivated to achieve success in their farming ventures are more likely to embrace protected cultivation. Their drive to excel makes them more open to adopting technologies that offer better yields and profitability.

Extension Contact and Perception Level : The positive and significant correlation (r = 0.304*) highlights that the farmers who have regular contact with agricultural extension services tend to have a better perception of protected cultivation. Extension services play a crucial role in educating and supporting farmers, thus enhancing their understanding and acceptance of the technology.

Extension Participation and Perception Level : The strong positive correlation (r = 0.386**) at one per cent level indicates that the farmers who actively participate in extension activities have a significantly better perception of protected cultivation. These activities provide practical knowledge and hands-on experience, which greatly influences their perspective.

Management Orientation and Perception Level : The significant correlation (r = 0.263*) suggests that the farmers with a strong management orientation or those who are more focused on managing their resources efficiently are more likely to perceive protected cultivation positively. Good management skills are essential for the successful implementation of this advanced farming method.

Accessibility to Subsidy and Perception Level : The strong positive correlation (r = 0.364**) shows that the farmers who have access to subsidies are more likely to have a favorable perception of protected cultivation. Subsidies help to lower the initial investment barriers, making the technology more financially feasible and appealing to growers.

Accessibility to Credit and Perception Level : The significant correlation (r = 0.229*) suggests that access to credit plays a role in shaping farmers' perception of protected cultivation. Farmers with better access to financial resources can more easily manage the costs associated with adopting this technology, leading to a more positive outlook.

Innovative Proneness and Perception Level : The highly significant positive correlation (r = 0.397**) at one per cent level indicates that the farmers who are more innovative and willing to experiment with new methods are more likely to have the most favorable perception of protected cultivation. These farmers tend to embrace new technologies and recognize their potential benefits quickly.

Risk Bearing Ability and Perception Level : The significant positive correlation (r = 0.296*) shows that the farmers with a higher capacity to take on risks tend to perceive protected cultivation more favorably. Since the technology involves high initial investments, those who are more comfortable with financial risks are better able to appreciate the long-term benefits and returns.

Extent of Contribution of Profile Characteristics on Perception of Capsicum Growers towards Protected Cultivation.

The results in Table 4 reveal that the variables age, family size and land holding of capsicum growers have not significantly contributed to the development of better perception towards protected cultivation. Whereas, variables such as education, farming experience, mass media exposure, scientific orientation, cosmopoliteness, economic motivation, achievement motivation, extension contact, management orientation, accessibility to credit, risk bearing, extension participation, accessibility to subsidy and innovative proneness had significant to highly significant contribution in developing better perception towards protected cultivation. All the 17 profile characteristics of capsicum growers had contributed to the tune of 71.60 per cent (R^2 = 0.716)

TABLE 4

Extent of contribution of profile characteristics on perception of Capsicum growers towards protected cultivation

(n=50)

Sl. No	Profile characteristics	Regression coefficient	SE of Regression coefficient	't' value
X_1	Age	0.374	0.346	0.925 NS
X_2	Education	0.230	0.463	2.013 *
X_3	Family size	0.279	0.193	0.692 NS
X_4	Land holding	0.122	0.211	1.736 NS
X_5	Farming experience	0.148	0.313	2.110 *
X_6	Mass media exposure	0.217	0.480	2.213 *
X_7	Scientific Orientation	0.282	0.716	2.536 *

Continued...

Table 4 Continued...

Sl. No	Profile characteristics	Regression coefficient	SE of Regression coefficient	't' value
X_8	Cosmopoliteness	0.340	0.763	2.246 *
X_9	Economic motivation	0.165	0.414	2.503 *
X_{10}	Achievement motivation	0.406	0.891	2.196 *
X_{11}	Extension contact	0.254	0.596	2.351 *
X_{12}	Extension participation	0.291	0.867	2.976 **
X_{13}	Management orientation	0.316	0.716	2.265 *
X_{14}	Accessibility to subsidy	0.282	0.818	2.897 **
X_{15}	Accessibility to credit	0.299	0.698	2.332 *
X_{16}	Innovative proneness	0.211	0.591	2.799 **
X_{17}	Risk bearing ability	0.389	0.819	2.106 *

NS= Non-significant; *= Significant at 5%; **= Significant at 1% , R^2=0.716

in developing better perception towards protected cultivation.

Strengths, Weaknesses, Opportunities and Challenges of Protected Cultivation as Perceived by Capsicum Growers

Strengths of Protected Cultivation as Perceived by Capsicum Growers

The data on the strengths of protected cultivation as perceived by capsicum growers are presented in Table 5. A notable 94.00 per cent of growers agree that protected cultivation offers high input use efficiency, highlighting its cost-effective nature in maximizing resource utilization. Further, 88.00 per cent recognize that protected cultivation leads to high yields and quality produce, particularly during off-seasons, enhancing export potential. Additionally, 80.00 per cent of respondents appreciate the capacity of protected cultivation to produce high-quality planting material and off-season nurseries, demonstrating its versatility in crop management. Equally, 80.00 per cent of growers also acknowledge the strong demand for capsicum in metropolitan cities, providing them with a reliable market for their produce. Moreover, 70.00 per cent of capsicum growers agree that the 50.00 per cent government subsidy is a vital strength, making the financial aspects of protected cultivation more accessible. Finally, 68.00 per cent of growers highlight the creation of a

Table 5

Strengths of protected cultivation as perceived by Capsicum growers

(n=50)

Particulars	Agree		Disagree	
	No.	%	No.	%
High input use efficiency	47	94.00	3	6.00
High yield, off-season production and quality produce with export potential	44	88.00	6	12.00
Production of high-quality planting material/ off-season nurseries	40	80.00	10	20.00
High demand for produce in metropolitan cities	40	80.00	10	20.00
Subsidy of 50 per cent being provided by Government	35	70.00	15	30.00
Favourable micro-climate for better crop growth	34	68.00	16	32.00

Table 6

Weaknesses of protected cultivation as perceived by Capsicum growers

(n=50)

Particulars	Agree		Disagree	
	No.	%	No.	%
High initial and operational cost of protected structure	46	92.00	4	8.00
Lack of marketing intelligence and strategy	38	76.00	12	24.00
Lack of cost effective and location specific design for greenhouses.	35	70.00	15	30.00
Environmental concern over the disposal of non- degradable plastic films used in protected structures	35	70.00	15	30.00
Knowledge and technology gaps in greenhouse management are prominent	33	66.00	17	34.00
Non-availability of tools and implements facilitating crop production operations under protected structures.	26	52.00	24	48.00

favorable micro-climate for better crop growth, illustrating the positive impact of controlled environments on enhancing capsicum cultivation conditions.

Weaknesses of Protected Cultivation as Perceived by Capsicum Growers

Data presented in Table 6 reveals the weaknesses of protected cultivation as perceived by capsicum growers. As high as 92.00 per cent of growers perceive that the high initial and operational costs of establishing protected structures, act as a major barrier for many potential adopters, followed by 76.00 per cent of respondents, who cite the lack of marketing intelligence and strategy as a significant weakness, limiting their ability to sell produce effectively. Additionally, 70.00 per cent of growers highlight the need for cost-effective, location-specific greenhouse designs and the environmental impact of non-degradable plastic films used in protected structures, emphasizing the demand for more sustainable alternatives. Knowledge and technology gaps in greenhouse management are perceived as weaknesses by 66.00 per cent of growers, indicating a pressing need for better education and training. Finally, 52.00 per cent of growers express concern over the non-availability of necessary tools and implements, which further hinders effective crop production within protected structures.

Opportunities of Protected Cultivation as Perceived by Capsicum Growers

The data in Table 7 reveals the opportunities of protected cultivation as perceived by capsicum

Table 7

Opportunities of protected cultivation as perceived by Capsicum growers

(n=50)

Particulars	Agree		Disagree	
	No.	%	No.	%
Scope to generate marketable surplus and also surplus for export.	44	88.00	6	12.00
Arrival of new technology (s) for farming community	39	78.00	11	22.00
Increasing horticultural product for domestics and export demand.	38	76.00	12	24.00
Scope for farmers to diversify crops and experiment with high value crops/varieties	38	76.00	12	24.00
Tremendous scope for establishment of processing units.	36	72.00	14	28.00
Revival of youths' declined interest in agriculture through hi-tech agribusiness and generation of young-skilled India.	34	68.00	16	32.00

growers. A significant 88.00 per cent of growers agree that there is a strong opportunity to generate marketable surplus and surplus for export, indicating the potential for expanding their market reach. Additionally, 78.00 per cent recognize that the arrival of new technologies for the farming community presents significant opportunities for improving practices and productivity. Furthermore, 76.00 per cent of growers acknowledge the increasing demand for horticultural products in both domestic and export markets, which is crucial for growth. In terms of diversification, 76.00 per cent of respondents perceived opportunities to experiment with high-value crops and varieties, reflecting their openness to innovation and adaptation. Moreover, 72.00 per cent believe there is tremendous scope for establishing processing units, which can enhance value addition and create more market opportunities for capsicum. Lastly, 68.00 per cent of growers perceive for reviving youth interest in agriculture through hi-tech agribusiness, paving the way for a new generation of skilled farmers.

Challenges of Protected Cultivation as Perceived by Capsicum Growers

Data in Table 8 reveals the challenges of protected cultivation as perceived by capsicum growers. It is observed from Table 8 that the challenges faced by capsicum growers in the context of protected cultivation highlight significant hurdles that impact their operations. A notable 84.00 per cent of growers believe that inefficiency in farm management significantly hinders their ability to capitalize on globalization and trade liberalization opportunities. Additionally, a substantial 82.00 per cent express concerns regarding market instability and the difficulty in receiving remunerative prices for their produce, further exacerbating their challenges. Moreover, 70.00 per cent of respondents acknowledge cash flow issues and bad debts as critical challenges that affect their overall financial stability and capacity to invest in protected cultivation. Further more, 72.00 per cent perceive a lack of established standards for crop production under protected cultivation, which can lead to inconsistencies in quality and practices. Compounding these issues, 68.00 per cent of growers recognize the exploitation by middlemen in the market chain, negatively impacting their profits and market access. Lastly, 58 per cent agree that there are insufficient standards for post-harvest management of the produce, indicating a pressing need for improvements in this area to ensure product quality.

As high as three-fourth (74.00%) of capsicum growers possessed good to better level of perception towards protected cultivation in terms of improvement in yield, produce quality, social recognition and economic benefits. Extension participation, accessibility to subsidy and innovative proneness of capsicum growers had significant relationship with their perception towards protected cultivation. Therefore, this calls for effective extension services (training programs, field visits, study tour and demonstrations)

Table 8

Challenges of protected cultivation as perceived by Capsicum growers

(n=50)

Particulars	Agree		Disagree	
	No.	%	No.	%
Inefficiency of farm management makes farmers difficult to get the advantages of globalization and trade liberalization.	42	84.00	8	16.00
Uncertainty about market stability and farmers do not get remunerative price.	41	82.00	9	18.00
Lack of standards for crop production in protected culture	36	72.00	14	28.00
Cash flow and bad debts problems	35	70.00	15	30.00
Exploitation by middleman in the market chain	34	68.00	16	32.00
Lack of standards for post-harvest management of the produce	29	58.00	21	42.00

to educate the growers on the benefits and techniques of protected cultivation. Further, there is an urgent need for policy to ensure that the subsidies are easily accessible and adequately cover the initial investment cost associated with establishment of protected structures. Also, while protected cultivation offers substantial benefits, addressing the identified weaknesses and challenges is crucial to harness its full potential and ensure sustainable growth for capsicum growers.

References

ANONYMOUS, 2022, Second advance estimates (2021-22) of area and production of horticultural crops released 2022. Ministry of Agriculture & Farmers Welfare, Government of India.

BALAKRISHNA, B. AND SHANKKAR, S. H., 2021, Greenhouse production of capsicum, tomato, cucumber and muskmelon. *Tech. Bull. No.01,* ICAR - IIHR, Hesaraghatta, Bengaluru (India).

DARSHAN, M. E., LAKSHMINARAYAN, M. T., SHIVAMURTHY, M., PATIL, S. S. AND BANUPRAKASH, K. G., 2019, Perception of farmers about the functioning of Raitha Samparka Kendras. *Mysore J. Agri. Sci.,* **53** (2) : 73 - 81.

EDWARDS, A. L., 1969, Techniques of attitude scale construction. VIkils, Feger and Dimons Pvt. Ltd., Sport Road, Ballard Estate, Bombay, **9** : 34 - 37.

GOPIKA, M. H. AND LALITHA, K. C., 2018, Perception of beneficiary and non-beneficiary farmers towards integrated farming system demonstration (IFSD). *Mysore J. Agri. Sci.,* **52** (2) : 227 - 233.

LIKERT, R. A., 1932, A technique for assessing attitudes. *Archives of Psychology*, New York : 140.

MEGHAJIT SHARMA SHIJAGURUMAYUM, LAKSHMINARAYAN, M. T. AND KRISHNAMURTHY, B., 2022, Perception of aromatic black rice growers towards mission organic value chain development scheme. *Mysore J. Agric. Sci.,* **56** (1) : 221 - 230.

MEHTA, K., 2020, Socio-economic impact of protected cultivation on tomato growers of Himachal Pradesh. *Economic Affairs*, **65** : 21 - 23.

PRAKASH, P., PRAMOD KUMAR, AMIT KAR, AWANI KUMAR SINGH AND ANBUKKANI, P., 2019, Progress and performance of protected cultivation in Maharashtra. *Indian J. Econ. Dev.* **15** : 555 - 563.

PREETHI, NATARAJU, M. S. AND LAKSHMINARAYAN, M. T., 2017, Perception of farm youth towards agriculture. *Mysore J. Agric. Sci.,* **51** (1) : 139 - 144.