



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(6): 1170-1173
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www.thepharmajournal.com
Received: 01-04-2022
Accepted: 04-05-2022

Shashikala S Ruli
Ph.D. Research Scholar
University of Agricultural
Sciences, Raichur, Karnataka,
India

Goudappa SB
Dean of student welfare
Head of department of
agricultural extension
UAS, Raichur, Karnataka, India

Reddy BS
Professor, Department of
Agricultural Extension
College of Agriculture, Kalburgi,
Karnataka, India

Chandargi DM
Director of Extension
UAS, Raichur, Karnataka, India

Corresponding Author
Shashikala S Ruli
Ph.D. Research Scholar
University of Agricultural
Sciences, Raichur, Karnataka,
India

Socio-economic impact of protected cultivation technology among farming community in Kalyana Karnataka region of Karnataka

Shashikala S Ruli, Goudappa SB, Reddy BS and Chandargi DM

Abstract

The study was conducted in Koppal and Ballari districts of Kalyana Karnataka region in Karnataka during the year 2020-21 to assess the socio-economic impact of Protected Cultivation Technology among farming community the results obtained indicated that the mean annual income of the respondents before the adoption of the protected cultivation technologies was found to be Rs. 104890.59 and after the adoption of protected cultivation technologies it was reported to be 187126.3 percentage change of 78.40 per cent. Land holdings of the respondents before the adoption of protected cultivation was 3.98 acres and after the adoption it was noticed to be 4.55 percentage change of 14.32 per cent. The mean annual employment man days before the adoption of protected cultivation was 457.33 man days and after the adoption were calculated to be 941.22 mandays with percentage change of 105.8 per cent. There was increase of 33.48 per cent in the material possession and it was found that before the mean number of materials was found to be 9.71 and after the adoption was 12.96. The mean score of social status was 1.60 and the score after the adoption of the protected cultivation was 3.93. The percentage of change in social status was 118.52 per cent. Substantial improvement in annual income, employment generation, material possession and social status of the respondents was observed. Hence, the government or the concerned development department need to promote the adoption of protected cultivation for improving the socio-economic status of the farming community.

Keywords: Socio-economic impact, protected cultivation technology and Kalyana Karnataka

Introduction

Horticulture is one of the major drivers of growth to provide food, nutritional security along with improving the economic condition of the farmers in the agricultural sector. It provides employment opportunities to major portion of the farming community in India. Fruit crops are relatively resilient to changes in weather conditions and identified to be a major source of livelihood for the farmers in the country. Vegetables are grown mostly by small and marginal farmers which augments the major part of income of farmers. Further, horticulture sector enables the population to enjoy a diverse and balanced diet for health living. This sector has gained importance over the last decade as a major contributor to the growth of agriculture and allied sectors.

Several measures have been taken by the government for the development of the horticulture sector in the country. The improved technologies have been continuously introduced in the country such High-tech horticulture in general and protected cultivation particular among the farming community with an intention to grow the horticultural crops in off-season also by reducing post-harvest losses. Protected cultivation has offered a new dimension to get more income in a limited area. A protected cultivation structure is a framed or an inflated structure covered with a transparent or translucent material in which crops could be grown under the conditions of at least partially controlled environment and which is large enough to permit supervisors and labour to work in carrying out cultural operations.

Indo-Israel project on greenhouse cultivation, initiated at the Indian Agricultural Research Institute (IARI) in 1998 was India's first effort to introduce hi-tech protected farming of high-value horticultural produce in the country later the project has been renamed as Centre for Protected Cultivation Technology (CPCT) and IARI continued to maintain the facility. The centre has been instrumental in designing greenhouse structures, refine and upscale the system to reduce costs besides to suit local conditions.

In India, the area under protected cultivation is presently around 50,000 ha. (Amita, 2020) [1], while the protected vegetable cultivation area is about 2,000 ha. (Chandan and Singh, 2015) [2].

Karnataka State is considered as Horticulture State in the country owing to its excellent soil and climatic conditions and multifaceted expertise in the sector. Total farming families in Karnataka are 78.2 lakh of which nearly 20 lakh farming families are dependent on horticulture sector. The production of vegetables mainly capsicum, European cucumber have increased by almost 5 times. Further, different flower crops such as gerbera, carnation, roses etc., are also grown resulting in higher productivity and supply of flowers throughout the year.

The state is promoting this under Rashtriya Krishi Vikasa Yojane (RKVY), National Horticulture Mission (NHM) and Krishi Bhagya Scheme. The Government has come up with various programmes and policies providing 50 per cent subsidy to farmers practising protected cultivations like greenhouse, net house, poly house etc., In this context, there is a need to undertake a research study on various aspects related to growth and development of PCT in India, extent of adoption by farmers and its socio-economic impact including productivity and sustainability. In present condition agriculture constraints like fragmentation of cultivable land, water scarcity, rapid urbanization, declining crop production and productivity, crashing market prices, declining biodiversity and ever increasing population, demand for food, especially vegetables has increased manifold. 'Protected cultivation' has offered a new dimension to get more income in a limited area in a district.

Several studies have been conducted on horticulture crops in open field condition to know the Adoption, but very few research studies have been conducted on protected cultivation in this regard. Some of the studies shown that, there is a tremendous scope for development of technologies which is suitable for vegetable production under protected cultivation. With this background, the study was undertaken with the following objective to assess the socio-economic impact of Protected Cultivation Technology among farming community.

Methodology

The study was conducted in Koppal and Ballari districts of

Kalyana Karnataka region in Karnataka during the year 2020-21. The districts were selected purposively due to maximum area under protected cultivation and also more scope for protected cultivation in these districts. From each district, 60 farmers who have adopted protected cultivation technology were selected for the study. Thus, the total sample of 120 farmers was selected by using simple random sampling procedure. A scale was developed to determine the attitude of the farmers towards Protected Cultivation Technology. A structured and pre-tested interview schedule prepared keeping in view the objectives of the study was used for the survey. The data were collected by personal interview and the focused group discussion method was used wherever it was found suitable. The data collected for the study was tabulated, processed and analysed using the suitable statistical methods.

Results and Discussion

Socio-economic Impact of Protected Cultivation Technologies

The impact of adoption of protected cultivation is presented in Table-1. The impact was measured in terms of change in average income, land holding, employment generation, material possession and social status of the respondents. The mean annual income of the respondents before the adoption of the protected cultivation technologies was found to be Rs. 104890.59 and after the adoption of protected cultivation technologies it was reported to be 187126.3. The percentage of change is found to be 78.40 per cent. The probable reasons for increase in income of the farmers could be the adoption of protected cultivation technologies which reduces the cost of cultivation and improves the income of the farmers. The technologies which can reduce the cost and improve the income are healthy seedling production, less incidence of the pest and diseases, regulation of growth factors responsible for plant growth efficient utilization of the resources such as land, soil, fertiliser, and pesticide and grading of produce. The results are in line with the study conducted by Itigi Prabhakar (2013) ^[4].

Table 1. Socio-economic Impact of Protected Cultivation Technologies (PCT)

Sl. No.	Activities	Mean values		Percentage of change
		Before	After	
1	Average income (Rs)	104890.59	187126.3	78.40
2	Land holding(acre)	3.98	4.55	14.32
3	Employment generation(Mandays)	457.33	941.22	105.8
4	Material possession (No.)	9.71	12.96	33.48
5	Social status.	1.60	3.93	118.52

(n = 120)

It is evident from the Table-1 that the impact of protected cultivation on land holdings of the respondents not much, the results indicate that the average land holdings of the respondents before the adoption of protected cultivation was 3.98 acres and after the adoption it was noticed to be 4.55. The percentage of change is calculated to be 14.32 per cent after the adoption of the protected cultivation. The results indicate the little change in the land holdings of the farmers after adoption of the protected cultivation technologies. This could be attributed to the fact of not involved in the activities of purchasing the land by majority of the farmers except few.

The mean annual employment man days before the adoption of protected cultivation was 457.33 man days and after the adoption were calculated to be 941.22 mandays. The

percentage of change was 105.8 per cent marking the greater impact on employment generation. The adoption of the protected cultivation ensures the year round production which in turn enhances the employment days in the years hence there is an increase in the number of employment days in the year.

The impact on material possession indicates that there was increase of 33.48 per cent in the material possession and it was found that before the mean number of materials was found to be 9.71 and after the adoption was 12.96. The income of the farmers increased as suggested by the results. The possible reason for obtaining such results could be, the investment capacity of the farmers increased hence most of the farmers have invested in purchasing of the farm machineries and other materials required for households.

The mean score of social status was 1.60 and the score after the adoption of the protected cultivation was 3.93. The percentage of change in social status was 118.52 per cent. The possible reasons for obtaining such results could be attributed to the fact of considering the PCT adopted farmers as resource farmers in agriculture and seeking the advice from the PCT adopted farmers which indicate the improvement in the social status of the farmers.

Impact of Protected Cultivation on Income

The impact of protected cultivation on income of the respondents is presented in Table 2. The percentage of increase in income from agriculture, protected cultivation/horticulture, animal husbandry and other sources was found to be 16.72, 135.56, 123.62, 27.78 and 78.40 per cent, respectively. The percentage change in annual income was 78.40 per cent.

Table 2: Impact of Protected Cultivation on Income of the respondents

Sl. No.	Source of Income (Rs.)	Mean Value		Percentage of change
		Before	after	
1	Agriculture	37326.89	43568.21	16.72
2	Protected cultivation/Horticulture	45808.32	107904.8	135.56
3	Animal husbandry	8195.26	18326.5	123.62
4	Other sources	13560.12	17326.74	27.78
	Total	104890.59	187126.3	78.40

(n = 120)

The reason for increase in the income of the farmers was increase in the income from horticulture crop cultivation. Since the adoption of the protected cultivation enhanced the productivity as well as production in small area hence the farmers income as increased sufficiently. The results are in line with the findings of Gnanasekaran and Vijayalakshmi (2014) and Itigi Prabhakar (2013)^[4].

Impact of Protected Cultivation on Land holding

The impact of protected cultivation on income of the respondents is presented in Table 3. The percentage of the change in land owned, land leased in and land leased out was calculated to be 9.24, 43.75 and 55 per cent, respectively. The total change in land holding was 14.32 per cent.

Table 3: Impact of Protected Cultivation on Land holding of the respondents

Sl. No.	Land holding (Acres)	Mean Value		Percentage of change
		Before	after	
1	Owned	3.46	3.78	9.24
2	Lease in	0.32	0.46	43.75
3	Lease out	0.2	0.31	55.00
	Total	3.98	4.55	14.32

(n = 120)

The plausible reason could be utilization of the existing land effectively than purchasing because the protected cultivation requires less space. The yield and production in the protected cultivation is also more when compared to open condition. The results are in line with the study conducted by Itigi Prabhakar *et al.* (2017)^[5].

of the respondents is depicted in Table 4. The percentage change in employment generation from agriculture activities, horticulture activities, subsidiary activities, business activities and labour sharing was found to be 86.50, 99.55, 92.88, 375.00 and 275.00 per cent respectively. The total change in employment generation was 105.8.

Impact of Protected Cultivation on Employment generation

The impact of protected cultivation on Employment generation

Table 4: Impact of Protected Cultivation on Employment generation of the respondents

Sl. No.	Activities	Employment Generation (Mandays)		Percentage of change
		Before	After	
1	Agriculture Activities	120.12	224.02	86.50
2	Horticulture Activities	275.21	549.19	99.55
3	Subsidiary activities	42	81.01	92.88
4	Business	12	57	375.00
5	Labour Sharing	8	30	275.00
	Total	457.33	941.22	105.8

(n=120)

The possible reason for increase in employment generation is year round production of the fruits and vegetables as well year round production of the off season fruits and vegetables which automatically increases the employment days in the year. The results are in line with the findings of Itigi Prabhakar (2013)^[4].

Impact of Protected Cultivation on Material possession

The impact of protected cultivation on material possession of the respondents is presented in Table 5. The data indicated that there was a negative change in number bullock cart and MB plough after the adoption of PCT. No change was observed in the percentage of change in number of wooden harrows, seed

cum fertilizer drill, television, and gas cylinder refrigerator and mixer grinder. The percentage of change in tractor, cultivator, power sprayer, combine harvester, power tiller, bund former and pump set was noticed to 162.50, 386.67, 183.78, 133.33, 300.00, 133.33 and 29.46 per cent, respectively. The percentage of change in Gobar gas, mobile phone, and two wheelers was noticed to be 225.00, 32.58 and 93.55 per cent, respectively. The two wheelers and the four-wheeler are increased by 1500 per cent.

The investment capacity of the farmers improved after the adoption of the protected cultivation hence farmers might have had surplus amount to purchase the household machineries. The farmers have purchase more of agriculture related materials s indicated in the study.

Impact of Protected Cultivation on Social status

The impact of protected cultivation on social status of the respondents is presented in Table 27. The results indicate that there is increase of 58.49 per cent in considering the respondents adopted PCT as resource person. Regarding maintain credit worthiness, there is 192 per cent increase in maintaining the credit worthiness. There is increase of 191.67 per cent in considering farm for education purpose to other respondents. The amount of change in involving in the development programme was calculated to be 148 per cent. There is increase of 103.85 per cent in considering the respondents as key communicator. There is increase of 171.88 per cent in seeking advice from the respondents. There is increase of 81.40 per cent in visiting the farm by fellow respondents.

Table 5: Impact of Protected Cultivation on Material possession of the respondents

(n=120)

Particulars	Impact		Percentage of change
	Before	After	
I. Agricultural machineries and implements			
Bullock cart	7	4	-42.86
MB Plough	17	11	-35.29
Wooden harrow	18	18	0.00
Seed cum fertilizer drill	18	18	0.00
Tractor	8	21	162.50
Cultivator	15	73	386.67
Power sprayer	37	105	183.78
Combine Harvester	3	7	133.33
Power tiller	12	48	300.00
Leveller / Bund former	3	7	133.33
Pump set / Oil engine	112	145	29.46
II. Home needs			
Television	120	120	0.0
Gobar gas	16	52	225.00
Gas cylinder	120	120	00
Refrigerator	120	120	00
Mixer and grinder	120	120	00
Telephone / Mobile	132	175	32.58
Conveyance			
a) Two wheeler	62	120	93.55
b) Four wheeler	1	16	1500
c) Two wheeler and Four wheeler	1	16	1500

The probable reason could be improvement in the farmers' income along with the experience in the PCT. When fellow farmers might have recognizing the farmers as resource persons and sought advices from PCT farmers which automatically enhance the social status of the farmers.

Conclusion

Substantial improvement in annual income, employment generation, material possession and social status of the respondents was observed. hence, the government or the concerned development department need to promote the adoption of protected cultivation for improving the socio-economic status of the farming community. Protected cultivation field has wider scope for research on package of practices, scale of finance and project preparation. SAU's, research institutes and respective developmental departments put at most effort to transfer of technologies to farmers' field and also help to provide information regarding loans, subsidy and insurance schemes among farmers.

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