

## Protected Farming: Problems, Prospects and Suggestions in Himachal Pradesh

Anjna Kumari

Research Scholar of Economics, HPU, Shimla India

### Abstract

The present study has been conducted in Hamirpur district of Himachal Pradesh on the primary data collected from the 150 sample polyhouse farmers to access the factor effecting the production of cucumber crop and resource use efficiency of cucumber crop. The polyhouse were classified into three categories, i.e. small (i.e.40 m<sup>2</sup>), medium (i.e.250 m<sup>2</sup>) and large (i.e.500 m<sup>2</sup>). Further each size of polyhouse has been divided into three crops, i.e. tomato, cucumber and cucumber. Thefarmers of the study area were facing a number of problems which can be categorized as production, financial, marketing, malpractices and miscellaneous problems. Among production problems, inadequate training to the polyhouse farmers was reported to be the major problem. The farmers also reported a number of problems on the marketing front.

**KEYWORDS:** production, marketing, financial and marketing

### Introduction:

The economy of Himachal Pradesh is third fastest growing economy in India. Agriculture contributes nearly 45 per cent to the net state domestic product. It is the main source of income as well as employment in Himachal. About 93 per cent of the state population depends directly upon agriculture. To achieve faster and more inclusive growth in the Eleventh Five Year Plan, the Department of Agriculture, Himachal Pradesh has prepared a project on production of cash crops by adoption of precision farming practices through polyhouse cultivation.<sup>1</sup> The most significant in this regard is 'Pandit DeenDayalKisanBaagwaanSamridhi Yojana,' a flagship programme for the upliftment of farmers in the state. The project provides for 80 percent subsidy to farmers for land up to 1000 square meters for developing polyhouses and to establish sprinklers and drip irrigation systems, the remaining 20 per cent is to be borne by the farmer himself. The scheme has been launched with the assistance of NABARD RIDF-IV Tranche. This project has been implemented in all the twelve districts of the state with an outlay of Rs. 353.01 crores. This project comprises of two parts, production of cash crops through adoption of precision farming practices through polyhouse cultivation for Rs. 154.92 crores and project on diversification of agriculture through micro-irrigation and other related infrastructure for Rs. 198.08 crores. The project has been launched in January 2009 for four years. Over the period of four years an area of about 2.59 lakh sq. meters is intended to be covered under the polyhouse cultivation. It envisages construction of 16500 polyhouses and bringing 20,000-hectare area under micro irrigation. Though the subsidy provided is 80 percent for BPL families, constructing polyhouses, the state government has decided to reduce the beneficiary share from 20 percent to 10 percent. Thus, such families will get a ninety percent subsidy. According to the information as provided by the department of agriculture, polyhouses have been constructed in 55.02 hectares of land in 2009-10 as against the targeted 48.88 hectares. For this an assistance of Rs. 24.24 crores was released to the farmer on account of construction of 4,796 polyhouses.<sup>2</sup>

A several studies on this theme has been conducted by **Gatenby, NeopaneandChemjon (1989)**<sup>3</sup>, **Mohayidin (1990)**<sup>4</sup>, **Sardar and Alam(1990)**<sup>5</sup> and **Nair and Barche (2014)**<sup>6</sup> etc have discussed the problems faced by farmers during the cultivation under polyhouses. They concluded that farmers did not get the complete technical knowledge about the working of drip irrigation system and subsidies and loans were not easily available. There was lack of regulated markets, poorly equipped both in terms of infrastructure and personnel and marketing problems faced by farmers limit increased arrivals at regulated markets.

### **1. Material and Methods:**

The pattern of input use provides important insights into the extent of adoption of technology in protected farming. Productivity level of any agricultural crop largely depends on the quality and quantity of critical inputs applied in the cultivation of the crop. As we know under the protected cultivation, off-seasonal crops are grown. In order to grow off-seasonal crops different type of costly and high quality inputs are used so it is very necessary to analyse the economic efficiency of inputs used for crops grown under protected farming.

#### **1.1.Objectives:**

The present study has been undertaken to achieve the following objectives: i) to study the socio-economic profile of the sample farms ii) to study the problems and prospects under protected cultivation; and iii) to suggest for further improvements for better outcome under protected cultivation

#### **1.2.Methodology:**

The present study has been conducted in Hamirpur District of Himachal Pradesh. A sample of 150 polyhouse farmers involved in cucumber cultivation under protected farming has been selected on purposive random sampling technique. The polyhouse growers were classified into three categories viz. small (40 m<sup>2</sup>), Medium (250<sup>2</sup>) and large (500 m<sup>2</sup>) with the sample size of 50, 70 and 30 from each size of polyhouse respectively. The collection of information is based on a structured questionnaire designed to collect relevant information on family size, land holding, cropping pattern, production, factors for production and factor cost etc. In the present paper, Tabular analysis has been done to study the socio-economic profile of the sample polyhouses owner as well as various problems and prospects faced by them during polyhouse farming. Simple percentage and average had been computed to study these aspects of polyhouse farming.

### **3. Results and Discussion:**

#### **3.1 Average Family Size, Percentage of Family Work Force, and Percentage of Dependents among the Sample Farms:**

The average size of family, percentage of labour force and the percentage of dependents among the sample farms has been presented in table I. The average size of family has been worked out, 6.88, 6.84 and 9.33 per cent on the small, medium and large size of farms respectively. The average size of family among all the sample farms together came out 7.35 as compared to the average size of family at the State level as a whole i.e. 4.66 according to 2011 census. Thus, as the farm size increases, almost the average size of family also increases. It shows that as the economic status of a household improves they become more social. The

percentage of labour force has been worked out 68.90, 63.67.08 and 61.30 per cent on the small, medium and large size of farms group respectively. Among all the farms together, this percentage came out 64.88 per cent. The percentage of dependents is the highest on the medium size of farms group (i.e. 36.32 per cent) as compared to the other class of farms. Among all the holding groups together, this percentage of dependents came out 35.12. Thus, the percentage ratio of labour force shows almost a decreasing tendency with an increase in the size of farms whereas, contrary to it, the percentage of dependents shows an increasing tendency with an increase in the size of farms. The lowest percentage of the dependent is on the small size of farms group mainly due to higher percentage of work force as compared to the medium and large size of farms.

### 3.2 Problems Faced by Sample Farms:

#### 3.2.1 Production problems

Polyhouses farming is a risky venture with respect to huge initial capital investment and uncertainty of the production. Thus, the sample farmers were confronted with number of problems related with the production of vegetables and flowers. The major problems faced by the sample farms has been presented in the table 2. Non-availability of healthy seeds, their untimely supply and exorbitant prices were the main problems reported by the farmers. More than 56 per cent of farmers in each farm size reported that the seeds were, generally, not available to them at the right time. The table shows that out of the total farm size about 63.33 per cent farmers have faced the problem of non-availability of seeds in right time. The percentage of sample farms out of the total sample size who has been faced the problem of non-availability of seeds has been worked out 68.00, 62.86 and 56.67 per cent on the small, medium and large size of farms, respectively. In agriculture development, inputs particularly quality seeds play a major role in promoting growth. Contrary to this, the table depicts that almost each category of sample size of farms viz. 54.00, 42.86 and 43.33 per cent on the small, medium and large size of farms respectively have informed that they are not supplied the quality seeds of various crops with result they have to purchase the quality seeds from the private agencies which are higher rates causing higher the cost of production in the study area. More than 16 per cent farmers in each farm size reported that they have no problem regarding the seed prices, availability and quality of seeds.

The table 2 reveals that 67.33 per cent sample farms are of the opinion that they are not receiving the fertilizers on time out of which are 76.00, 61.43 and 66.67 per cent on the small, medium and large size of farms respectively. Whereas, about 35.33 per cent of sample farms are of the opinion that even for the less use of fertilizers they have to pay higher prices. The table depicts that almost each sample size of farms viz. 38.00, 30.00 and 43.33 per cent on the small, medium and large size of farms respectively have informed that the fertilizers are available at the higher rates. Only 17.33 per cent farmers in each farm size reported that they have no problem regarding the price, availability of fertilizers etc.

About 32 per cent farmers out of the total farms size are of the opinion that they do not have efficient source of irrigation of which are 38.00, 30.00, and 26.67 per cent on the small, medium and large size of farms respectively have informed that they do not have efficient sources of irrigation. About 66 per cent of farmers among all the sample size of farms reported the acute shortage of water as the major

hindrance in extending the area under off-season vegetables as well as getting higher yields in the study area out of which 38.00, 30.00 and 43.33 on the small, medium and large sample size of farms respectively have faced the problem about the shortage of water. As such, 17 per cent sample farms out of the total farm size are of the opinion that they have no problems regarding the irrigation facilities in the study area.

About 38.00 per cent farmers out of the total sample farms residing in Hamirpur reported that they do not have knowledge about the plant protection material out of which 46.00, 30.00 and 43.33 per cent on the small, medium and large size of farms respectively have no awareness about the importance of plant protection material for the growth and high production of crops. The table depicts that 52.00, 61.43 and 66.67 per cent on the small, medium and large size of farms respectively out of the total sample farm size are of the opinion that plant protection material is not easily available. They informed that they are not supplied the required quantity of plant protection material with the result they have to purchase the remaining quantity from private agencies to fulfill their plant protection material's requirement which are higher rates causing higher cost of production in the study area. About 7.33 per cent farmers among all sample size of farms has reported that they have no problem regarding the availability, prices of plant protection material, which is quite low.

About 42.67 per cent farmers among all the sample size of farm reported that they are not able to get labour in peak period of crop cultivation. The percentage of sample farms out of the total sample size who have the non-availability problem of labour at peak period has been worked out 38.00, 40.00 and 56.67 per cent on the small, medium and large size of farms respectively. About 29.33 per cent farmers out of the total sample farms residing in Hamirpur reported that the labour is available at higher wage rates causing higher cost of production in the study area out of which 28.00, 24.29 and 43.33 per cent on the small, medium and large size of farms respectively have informed that labour is very costly. About 34.00 per cent among all the sample size have no problem about the availability and wages of labour.

The problem of post-harvest management are more important than that of production. The problems related to post-harvest management includes preparing the produce for the market like grading, packaging, transportation and selection of markets. The problem of post-harvest management mainly arise on account of perishable nature of produce. About 32 per cent farmers out of the total farms size are of the opinion that they do not have the idea about the appropriate stage of harvesting of which are 38.00, 30.00, and 26.67 per cent on the small, medium and large size of farms respectively have informed that they have not the fair ideas about the harvesting stage. About 66 per cent of farmers among all the sample size of farms reported that non-availability of grading facilities is the major hindrance in extending the area under off-season vegetables in the study area out of which 72.00, 61.43 and 66.67 on the small, medium and large sample size of farms respectively have informed the same problem. The table reveals that 52.67 per cent sample farms are of the opinion that they are not receiving the cold storage facilities of which 56.00, 54.29 and 43.00 per cent on the small, medium and large size of farms respectively.

### **3.2.2 Marketing Problem:**

Profit from growing of vegetables depend upon many factors, i.e. time of picking, care taken in grading and packing, time taken in transportation etc. Keeping all these factors, the sample farms were enquired about the problems faced by them in

marketing of their produce. Majority of the farmers were not found to be adopting the grading practices. The most important factor in the process of marketing was that of packing in the study area. The selected vegetables were packed in wooden boxes and gunny bags etc. For carrying the produce from the farm to market, different packing material like crates, gunny bags, wooden basket etc. were used. More than 14 per cent of sample farmers, in each farm size, reported that the packing material was not available at the right time and also more than 40.00 per cent farmers, in each farm size, reported the high cost of packing material. In order to reduce the packing cost, it was advised to avoid unnecessary use of fancy material. The material used for packing must have enough strength to protect from breakage, spoilage, etc. and must suit the needs of the consumers.

About 48.67 per cent of growers responded that they faced the problem of non-availability of transport means of which 54.00, 47.14 and 43.33 per cent on the small, medium and large size of farms respectively. The table reveals that 42.67 per cent sample farms are of the opinion that they have faced the problem of high transport charges of which 46.00, 40.00 and 43.33 per cent on the small, medium and large size of farms respectively. There should be reduction in the barriers to movement of produce so that the time taken in transportation and quantity of fuel consumed would be reduced.

Market intelligence is more important from the producer's point of view because this gives them an idea about the prevailing price of the produce in the market. Nearly, 56.00 per cent of the small, 54.29 of medium and 43.33 per cent of large farmers among the sample farms reported that they do not have any information in respect of vegetable prices prevailing in the market, while 18.00 per cent of the small, 12.86 of the medium and 30.00 per cent of the large farmers observed that information was available for limited market and in the late period which considered to be inadequate in marketing decisions for the sale of their produce. The farmers of study area also reported problem in disposing off the produce, delayed payments, lack of well-organized markets nearby growing areas and more than 44 per cent of farmers in each farm size reported that the price of the vegetable which they were getting were not remunerative.

### **3.2.3 Other Problems:**

The most of the farmers in each farm size reported that there is poor extension services in the field of agriculture. They reported that they do not receive any technical advice for cultivation of these vegetables from Government officials.

Lack of technical know-how was also one of the major problems experienced by the sample farms, as the polyhouses farming is a capital intensive and highly technical enterprise. The varieties of the vegetable crops and production technology were changing very rapidly and the knowledge is not upgraded with the same pace. The facilities for the training in the field of vegetable farming were lacking in the vicinity. It can be seen from the table that about 27 per cent of the respondents were having the problem of lack of training and technical know-how in the field of vegetable production under polyhouses farming.

In addition to all these problems mentioned above, farmers have also faced other problems related to proper design of polyhouses. The polyhouses farming of vegetable crops is done under polyhouses/ greenhouses. So, the proper design of polyhouses is very important depending on the climatic conditions and types of crops

grown. But very a smaller number of sample farms in the study area were having such type of problem. It was observed that about 7 per cent of the sample farmers were facing problem related to the proper structure of polyhouses. It can be attributed to the fact that keeping in view the high cost of polyhouses the farmers might have consulted the experts before construction of the same.

#### **4. Prospects Regarding Polyhouses Farming:**

Polyhouses cultivation of off seasonal crops has gained a great deal of commercialization on account of increasing demand. The polyhouses farming's farmers are also becoming popular among the farming communities due to the availabilities of production technologies as well as through the incentives of the Government. Varieties of off seasonal crops can be grown under polyhouses which cannot produce more effectively in open conditions. The views of the sample farms regarding the future prospects of polyhouses farming on different aspects has been collected and have been presented in table 3. The majority of the sample farms, i.e. 56.67 per cent felt that the Government is providing large number of incentives for the promotion of the polyhouses farming. It was also indicated by 43.33 per cent of the sample farms that, off seasonal vegetables productivity is higher under polyhouses. Similarly, about 42.67 per cent of sample farms indicated that the private sector is coming forward to meet the growing demand of the farmers with respect to critical inputs and infra-structure related to construction of polyhouses.

It was also indicated by 40.00 per cent of the sample farms that production of off seasonal crops was a profitable activity when compared with other farm activities. About 36.67 per cent of the sample farms were of the view that the demand of the off seasonal crops in the market is showing an increasing trend due to the improvement in income level of the people. It was also indicated by 31.33 per cent of the sample farms that it was helpful to increase the level of income, whereas, 26.67 per cent of the sample farms of the view that polyhouses farming helped to increase the prices of off-seasonal crops which help the farmers to earn handsome amount of income.

The discussion revealed that the production of off seasonal crops under polyhouses farming has bright future prospects and will be instrumental in improving the socio-economic status of the farming community.

#### **5. Suggestions and Recommendations**

- It was found that farmers grow vegetables in the polyhouse without any consideration of the trends in market prices. The polyhouses farming of vegetables in early or late seasons could prove to be a bonanza to farmers to reap the benefits of lean season high prices.
- Malpractices in the market such as faulty weighing, improper auction prices *etc.* should be checked.
- It was suggested *to* incorporate cold storage facilities in the study markets as it helps in reduction of losses which constituted major portion of marketing cost.
- The farmers should be encouraged to form their own marketing cooperatives and thereby promoting group marketing which would not only reduce the marketing cost but also increase the producer's share in consumer's rupee and also avoid inconvenience faced by the vegetable growers in bringing their produce to the market.

- The latest and updated local, state and national level market information should be made available to producers by market committees and marketing board through large display boards for developing market intelligence among the farmers.
- With the advancement of the technology the knowledge and skills have an important role in augmenting the income of the growers. Therefore, there is a need of proper training of polyhouse farmers to imbibe better technical know-how regarding cultivation of different crop enterprises, and
- Adequate amount of money needs to be allocated for Research and Development to find out solutions to the emerging problems and also to develop package and practice for polyhouse cultivation.
- The problem of scarcity of labour arises especially in large farms. Hence, improved implements of small horse power tractors etc. will help to reduce the labour shortage problem.
- Creation of basic infrastructural facilities like rural link roads, transport and communication etc. are essential to accelerate the process of crop diversification which also needs to be improved in the area.

**Table I: Average Family Size, Percentage of Family Work Force, and percentage of Dependents among the Sample Farms**

Sr. No.	Particulars	Among the Sample Farms			
		Small	Medium	Large	All farms
1	Total Numbers of Sample Farms	50	70	30	150
2	Total Number of Family	344	479	279	1102
3	Average Size of Family	6.88	6.84	9.3	7.35
4	<b>Percentage of Family Work Force</b>				
a)	Male	109 (66.06)	165 (70.21)	111 (68.52)	385 (68.51)
b)	Female	130 (72.63)	140 (57.38)	60 (51.29)	330 (61.11)
c)	Total	239 (68.90)	305 (63.67)	171 (61.30)	715 (64.88)
5	<b>Percentage of Dependents</b>				
a)	Males	56 (33.93)	70 (29.78)	51 (31.48)	186 (33.09)
b)	Females	49 (27.37)	104 (42.62)	57 (48.71)	210 (38.88)
c)	Total	105 (30.52)	174 (36.32)	108 (38.70)	387 (35.12)
6	<b>Literacy Percentage</b>				

a)	Male	165 (94.50)	235 (96.20)	162 (98.80)	572 (96.70)
b)	Female	179 (82.60)	244 (86.10)	117 (90.60)	542 (86.40)
c)	Total	344 (88.80)	479 (91.00)	279 (95.3)	1102 (91.60)

**Note:** Figure in parenthesis indicates percentage to total family members of each category.

**Table2: Production, and Marketing Problems of Sample Farms**

Sr. No.	Particular	Sample size			
		Small	Medium	Large	All farms
1	<b>Production problems</b>				
(a)	<b>Supply of seeds</b>				
(i)	Non availability of seeds in time	34 (68.00)	44 (62.86)	17 (56.67)	95 (63.33)
(ii)	Poor quality of seeds	27 (54.00)	30 (42.86)	13 (43.33)	70 (46.67)
(iii)	Rate of seeds are very high	14 (28.00)	15 (21.43)	8 (26.67)	37 (24.67)
(iv)	No problem	8 (16.00)	16 (22.86)	5 (16.67)	29 (19.33)
(b)	<b>Manures and Fertilizers</b>				
(i)	Non available in time	38 (76.00)	43 (61.43)	20 (66.67)	101 (67.33)
(ii)	High costs	19 (38.00)	21 (30.00)	13 (43.33)	53 (35.33)
(iii)	No problem	7 (14.00)	10 (14.29)	9 (30.00)	26 (17.33)
(c)	<b>Irrigation</b>				
(i)	Not efficient sources of irrigation	19 (38.00)	21 (30.00)	8 (26.67)	48 (32.00)
(ii)	Acute shortage of water	36 (72.00)	43 (61.43)	20 (66.67)	99 (66.00)
(iii)	No problem	9 (18.00)	11 (15.71)	5 (16.67)	25 (16.67)
(d)	<b>Plant Protection</b>				
(i)	Lack of knowledge	23 (46.00)	20 (30.00)	13 (43.33)	57 (38.00)
(ii)	Not available in time	26 (52.00)	43 (61.43)	17 (56.67)	86 (57.33)
(iii)	High cost	28 (56.00)	38 (54.29)	20 (66.67)	86 (57.33)
(iv)	No problem	2	6	3	11



		(4.00)	(8.57)	(10.00)	(7.33)
<b>(e)</b>	<b>Labour</b>				
(i)	Not available in peak period	19 (38.00)	28 (40.00)	17 (56.67)	64 (42.67)
(ii)	High wage rate	14 (28.00)	17 (24.29)	13 (43.33)	44 (29.33)
(iii)	No problem	26 (52.00)	21 (30.00)	4 (13.33)	51 (34.00)
<b>(f)</b>	<b>Post- Harvest</b>				
(i)	Lack of knowledge about appropriate stage of harvesting	19 (38.00)	21 (30.00)	8 (26.67)	48 (32.00)
(ii)	Non-availability of grading facilities	36 (72.00)	43 (61.43)	20 (66.67)	99 (66.00)
(iii)	Cold storage facilities are not available in the local area	28 (56.00)	38 (54.29)	13 (43.33)	79 (52.67)
<b>2</b>	<b>Marketing Problems</b>				
<b>(a)</b>	<b>Packing material</b>				
(i)	Lack of timely supply	16 (32.00)	10 (14.29)	9 (30.00)	35 (23.33)
(ii)	High price of packing material	28 (56.00)	28 (40.00)	13 (43.33)	69 (46.00)
(iii)	No problem	9 (18.00)	21 (30.00)	4 (13.33)	34 (22.67)
<b>(b)</b>	<b>Transportation</b>				
(i)	Lack of appropriate transportation means	27 (54.00)	33 (47.14)	13 (43.33)	73 (48.67)
(ii)	High transport charges	23 (46.00)	28 (40.00)	13 (43.33)	64 (42.67)
(iii)	No problem	8 (16.00)	10 (14.29)	4 (13.33)	22 (14.67)
<b>(c)</b>	<b>Marketing Intelligence</b>				
(i)	No information available	28 (56.00)	38 (54.29)	13 (43.33)	79 (52.67)
(ii)	Late and limited information	9 (18.00)	9 (12.86)	9 (30.00)	27 (18.00)

**Note:** figures in parenthesis denotes percentage

**Table 3: Opinions of the Sample Farms regarding Future Prospects of Polyhouses Farming**

Sr. No.	Particular	Sample size			
		Small	Medium	Large	All farms
1	Input availability is being improved through the private	22 (44.00)	29 (41.43)	13 (43.33)	64 (42.67)

	enterprise				
2	Development of new varieties by research institutes	15 (30.00)	24 (34.29)	8 (26.67)	47 (31.33)
3	High Productivity	10 (20.00)	39 (55.71)	16 (53.33)	65 (43.33)
4	Demand of off seasonal crops is increasing	15 (30.00)	25 (35.71)	15 (50)	55 (36.67)
5	Improvement in income level of people	12 (24.00)	27 (38.57)	8 (26.67)	47 (31.33)
6	Off seasonal crops are relatively profitable	19 (38.00)	26 (37.14)	15 (50)	60 (40)
7	Increasing price trend of off seasonal crops	15 (30.00)	18 (25.71)	7 (23.33)	40 (26.67)
8	Government policies and incentives	25 (50.00)	40 (57.14)	20 (66.67)	85 (56.67)

Note: Figures in parenthesis denotes percentage

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