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**Raju Choudhary**
Ph.D. Scholar, Department of Agricultural Economics, SKN College of Agriculture (SKNAU), Jobner, Jaipur, Rajasthan, India

**Sonu Jain**
Assistant Professor, Department of Agricultural Economics, SKN College of Agriculture (SKNAU), Jobner, Jaipur, Rajasthan, India

**PS Shekhawat**
Assistant Professor, Department of Agricultural Economics, SKN College of Agriculture (SKNAU), Jobner, Jaipur, Rajasthan, India

**Corresponding Author**
**Sonu Jain**
Assistant Professor, Department of Agricultural Economics, SKN College of Agriculture (SKNAU), Jobner, Jaipur, Rajasthan, India

# Constraints in production and marketing of vegetables under polyhouse and normal field conditions in Jaipur district of Rajasthan state

**Raju Choudhary, Sonu Jain and PS Shekhawat**

**Abstract**
The analysis of constraints faced by the farmers in production and marketing of vegetables is a key concern not only for its main stakeholders but also for the economists. Such studies help in bridging the gaps in the implementation of agricultural policies and making appropriate strategies. The present study attempts to identify the constraints in the production and marketing of vegetables under polyhouse and normal field conditions. Data related to both production and marketing constraints were collected for the period of 2016-17 from Jaipur district of Rajasthan and Garrett ranking technique was used for ranking them. Infestation of nematodes and high cost of seeds were found to be the major production constraints in polyhouse. Also, short life of polyethylene sheet was observed to be a problem area in case of polyhouse as weather conditions changes rapidly. Besides this, erratic and extreme weather conditions, fear of failure of technology and lack of knowledge about latest package of practices negatively affected the production in polyhouses. The major constraints in normal field condition were found to be the attack of insects, pests and diseases followed by high cost of fertilizer, lack of availability of fertilizer at appropriate time, high cost of plant protection chemicals and scarcity of labour. Lack of minimum support price, high price fluctuations and lack of knowledge of market, high cost of transportation, malpractices in weighing, lack of adequate packing material and heavy loses of vegetables in market were some of the major marketing constraints identified in the study.

**Keywords:** problems, production, marketing, polyhouse, normal field condition

## Introduction
India is a land of diversity with two third of its population depends on agriculture and contributing about 15.8 per cent to the GDP, these are preliminary grains, oilseeds, fiber crops, fruits and vegetables. Vegetables play a vital role in Indian agriculture by providing food, nutritional and economic security to the people of India with higher returns per unit area to the producers. Vegetables contain carbohydrate, protein, minerals and vitamins and also possess medicinal properties. According to Indian Council of Medical Research (ICMR), intake of 300 g vegetables per capita per day is prerequisite for human diet but the availability of vegetables in India is only 220 g per capita per day, which is very low compared to the recommended diet. The low availability of vegetables in India is owing to the high population pressure and heavy post-harvest losses (approximately 35 per cent).
India is second largest producer of fruits and vegetables in the world. In India, vegetables were grown on 10,259 thousand hectares producing 1,84,394 thousand metric tons with productivity of 17.97 Metric tons per hectare in the year 2017-18 (Horticultural Statistics at a Glance, 2018). In Rajasthan, area and production of vegetables was 163.2 thousand hectares and 1674.0 thousand metric tons, respectively and the productivity of vegetables was 10.26 metric tons during the year 2017-18. Vegetable growers can substantially increase their income by greenhouse cultivation of vegetables during off season as the vegetables produced in the normal season generally do not fetch good returns owing to availability of these vegetables in the market in large scales. However, vegetable crops are confronted with numerous production and marketing problems/ constraints due to their highly perishable nature, high-tech requirements, costly planting materials/seeds, inputs etc. Thus, for encouraging the production and efficient marketing of these crops, various problems in their production and marketing with which they are confronted needs to be identified. Rashid, 2003 [18]; Mabuza, Ortmann, and Wale (2013) [11] reported that due to various constraints farmers are not getting expected benefit from their investment. Protected cultivation involves protection from adverse environmental conditions and offers distinct advantages of quality, productivity and favorable market prices to the growers (Singh, 2005) [25].

The producers and the consumers often get a poor deal and the middlemen control the market, but do not add much value. There is also massive wastage, deterioration in quality as well as frequent mismatch between demand and supply both spatially and over time (Subbanarasiah, 1991; Singh, 1985) [29, 26].

The scope of area expansion under cultivation of vegetables is very little. The only option is vertical expansion through increased productivity and cropping intensity using protected farming with environment control measures, quality seeds, fertilizers and plant protection measures (Singh, and Chauhan, 2004) [27]. In the recent years, increasing attention has been focused on several environmentally safe methods of pest management, including polyhouse cultivation to reduce pesticide use mainly because of growing concern over food safety issues and environmental concerns. The protected cultivated technologies especially polyhouse technology required high initial investment and the production of off-season vegetable crops under poly house conditions are evaluated for total yield, earliness, other characters and incidence of insect pests (Cheema, Kaur, & Kaur, 2004). The returns are good as polyhouse enables the cultivators to grow crops throughout the year irrespective of season. Also, the quality of produce is better than the normal field condition. Specific objective of the study to identify the problems faced by the vegetables growers in production and marketing of vegetables grown under polyhouse and normal field conditions.

## Methodology

To identify the problems faced by the vegetable farmers in production under polyhouse and normal field conditions and in marketing of vegetables under both conditions, primary data from the sample farmers were collected and multistage random sampling technique was adopted. Jaipur district of Rajasthan State was selected purposively as it has highest area and production of selected vegetables i.e. tomato and green chilli. From Jaipur district, two tehsils namely; Jaipur and Chomu were selected randomly with polyhouses and normal fields vegetable farmers. Three villages from each selected tehsil i.e. Jaitpura, Samod and Singod Kalan from Chomu and Baseri, Kapariyawas and Pachar from Jaipur tehsil were selected randomly with vegetable growers. Information regarding the problems faced by the vegetable growers was collected individually by interviewing the respondents with the help of schedules specially designed for the purpose.

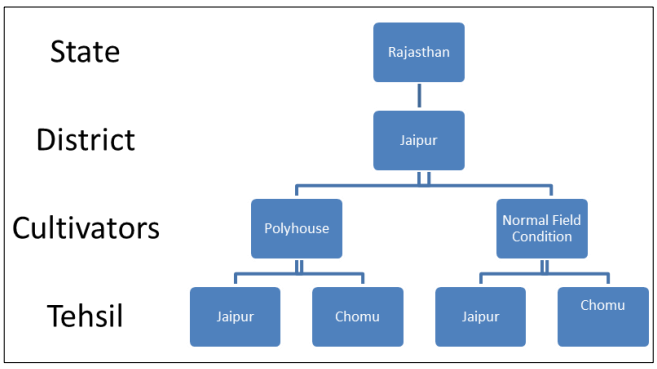


**Fig 1:** Flow Chart of Sampling Procedure

## Garrett's ranking technique

Garrett's ranking technique was used to analyze the problems faced by vegetable growers in production and marketing. The vegetable growers were asked to rank the factors they were facing. The rankings of the constraints assigned by the farmers were converted into per cent terms by using the following formula:

$$\text{Per cent position} = \frac{100\ (R_{ij} - 0.50)}{N_j}$$

**Where**

$R_{ij}$ = Rank given for $i^{th}$ item by $j^{th}$ individual farmer

$N_j$ = Number of items ranked by $j^{th}$ individual farmer

The per cent position of each rank thus obtained was converted into scores by referring to the tables given by Garrett and Woodworth, 1969. Then for each problem, the scores of individual farmers were added together and divided by the total number of farmers for whom scores were added. The mean scores for all the problems were ranked by arranging then in descending order.

## Results and Discussion

Study was done to find out the constraints faced in production of vegetables by the vegetable growers under polyhouse and normal field conditions and in marketing of vegetables by both polyhouse and normal field growers. The problems faced by polyhouse growers got a significant importance as this is a high earning method of growing vegetables. Farmers under polyhouse and normal field conditions in vegetable production and marketing faced several important constraints in the study area.

## Constraints in Production of Vegetable under Polyhouse

The study was done to analyze the problems responsible for low yield and low income by the farmers. Table 1 presents the major problems faced by the farmers in production of vegetables under polyhouse condition.

The major problem in production of vegetable under polyhouse condition was infestation of insects, nematodes and diseases which was ranked first and reported by 66.37 per cent of respondents. The similar results were found out by Ghana's (Mukteshwar & Sherawat, 2015; Nimbrayan, Chauhan, Tanwar, & Grover, 2018) [6, 13]. Second major problem was short-life of polythene sheet with 65.35 per cent respondents. High cost of fertilizer (64.19 per cent) ranked third and fourth problem faced by respondents was high cost of seed (61.61 per cent). High weather fluctuation problem ranked fifth by the sample farmers with 60.35 per cent farmers followed by fear to failure of technology (60.26 per cent), lack of availability of polythene material (60.22 per cent), high cost of labour (59.28 per cent farmers). Problem of weed infestation (59.7 per cent), lack of skilled labour (58.29 per cent), lack of availability of fertilizer at appropriate time (57.44 per cent) and lack of knowledge of latest package of practices (57.16 per cent sample farmers) ranked ninth, tenth, eleventh and twelve, respectively by the sample respondents. Sarkar (2007) [20]; Sreedhara (2010) [28] opined that lack of availability of high yielding varieties and pest resistant varieties, non-availability of labourers on time and lack of technical guidance were the major problems in protected cultivation. The scarcity of labor (55.52 per cent) was ranked as thirteenth by the famers. Challa (2001) [1] concluded that labour supply was a problem in protected cultivation. The least problem faced by the respondent farmers was lack of availability of quality seeds (54.67 per cent farmers) which

was ranked fourteenth. The similar results were found out by Kumar, Chauhan, Rohilab, and Grover (2016) [9] and opined that lack of quality seeds was one of the major production constraints in polyhouse.

**Table 1:** Constraints in production of vegetable under polyhouse condition

| Problems reported by the farmers | Respondents (Number) | Total score | Total mean | Rank |
|---|---|---|---|---|
| Short life of polythene sheet | 120 | 7842 | 65.35 | 2 |
| Infestation of insects, nematodes and diseases | 120 | 7965 | 66.37 | 1 |
| High weather fluctuation | 120 | 7242 | 60.35 | 5 |
| Lack of availability of polyhouse material | 120 | 7226 | 60.22 | 7 |
| Lack of skilled labour | 120 | 6995 | 58.29 | 10 |
| Scarcity of labour | 120 | 6662 | 55.52 | 13 |
| Lack of availability of quality seed | 120 | 6560 | 54.67 | 14 |
| High cost of fertilizer | 120 | 7703 | 64.19 | 3 |
| High cost of seed | 120 | 7393 | 61.61 | 4 |
| Fear to failure of technology | 120 | 7231 | 60.26 | 6 |
| Lack of knowledge of latest package of practices | 120 | 6859 | 57.16 | 12 |
| Weed infestation | 120 | 7164 | 59.7 | 9 |
| High cost of labour | 120 | 7114 | 59.28 | 8 |
| Lack of availability of fertilizer at appropriate time | 120 | 6893 | 57.44 | 11 |

**Source:** Field survey, 2016

Problem of nematode and insect were the main constraints as they damage the plants and reduce the production. The constraint in polyhouse cultivation is short life of polyethylene sheet, since the life of polyethylene sheet is less and it gets damaged during high wind flow. High cost of seed also accounts as a major constraint as specific variety of seed/seedling were grown in polyhouse.

**Constraints in Production of Vegetable under Normal Field Condition**

The study was done to analyze the problems responsible for less yield and low income by the farmers. The major problems faced by the farmers in production of vegetables under normal field condition are presented in Table 2.

**Table 2:** Constraints in production of vegetable under normal field condition

| Problems reported by the farmers | Respondents (Number) | Total score | Total mean score | Rank |
|---|---|---|---|---|
| High cost of fertilizer | 120 | 7202 | 60.0 | 2 |
| High weather fluctuation | 120 | 6945 | 57.9 | 6 |
| Attack of insects, pests and diseases | 120 | 7450 | 62.1 | 1 |
| High cost of plant protection chemicals | 120 | 7070 | 58.9 | 5 |
| Weed infestation | 120 | 7087 | 59.1 | 4 |
| Lack of availability of fertilizer at appropriate time | 120 | 7160 | 59.7 | 3 |
| High cost of seed | 120 | 6720 | 56.0 | 7 |
| High cost of labour | 120 | 6569 | 54.7 | 9 |
| Scarcity of labour | 120 | 6463 | 53.9 | 10 |
| Lack of availability of quality seed | 120 | 6628 | 55.2 | 8 |

**Source:** Field survey, 2016

The major problem in production of vegetable under normal field condition was infestation of insects, pests and diseases which was ranked first and reported by 62.10 per cent of respondents. Pokhrel (2010) [16] opined that diseases and pests severities were a major constraint under vegetable cultivation. Second major problem was high cost of fertilizer with 60.00 per cent respondents. Lack of availability of fertilizer at appropriate time (59.70 per cent) ranked third and fourth problem faced by respondents was weed infestation (59.10 per cent). Problem of high cost of plant protection chemicals ranked fifth by the sample farmers with 58.90 per cent farmers. Similar finding were also obtained by Fawole (2007) [4]; Okon and Enete (2009) [14]. Problem of high weather fluctuation (57.90 per cent), high cost of seed (56.00 per cent) and lack of availability of quality seeds (55.20 per cent sample farmers) ranked sixth, seventh and eighth respectively by the sample respondents. Jat, Singh, Lal, and Choudhary (2012) [8]. concluded that high cost of seed was a problem under vegetable cultivation. The high cost of labour (54.70 per cent) was ranked as ninth by the famers. Similar findings were reported by Maru and Gibramu (2014) [12]. The least problem faced by the respondent farmers in production of vegetables under normal field condition was scarcity of labour (53.90 per cent farmers) which was ranked tenth Pandit and Basak (2013) [15]; Sudhagar (2013) [30]; Sharma (2014) [22] also got the same results.

The major constraints in normal field condition are attack of insect, pest and disease as compared to polyhouse condition. Weed infestation creates problem in normal field condition as weeds create competition for nutrient and place, and retard the growth of vegetables seedlings.

**Constraints in Marketing of Vegetable under Polyhouse and Normal Field Conditions**

Constraints faced by the respondent farmers were same under polyhouse and normal field conditions because marketing activity takes place after harvesting of the crop in the field and occurred while taking the produce to the market for selling the vegetables.

Constraints related to marketing are presented in table 3. It is clear from the study as depicted in the table, that lack of minimum support price was the biggest and major problem reported by 60.47 respondents and ranked first. Second major problem faced by the farmers in marketing of vegetables was

high price fluctuation with 58.89 per cent sample farmers. Problem of lack of suitable cold storage facilities (57.63) (Saravanan, 2012) [19], lack of market information (57.42) (Pokhrel, 2010; Challa, 2001; Prajapati, Patel, Chaudhary, and Soni, M. 2002; Shrivastawa, 2003) [16, 1, 17, 24], high cost of transportation (56.68), malpractices in weighing (55.9) (Satapathy & Das, 1996; Farida & Fariya, 2014) [21, 3] and lack of quality packing material (53.07) ranked third, fourth, fifth, sixth and seventh, respectively. Nimbrayan, Chauhan, Tanwar, and Grover, 2018 [13] opined that lack of Minimum Support Price, High price fluctuation and lack of market information were the major constraints in marketing of vegetables. The problem of heavy market loss (51.73 per cent) was ranked as eighth by the sample famers. The least problem faced by the respondent farmers in marketing of vegetables under polyhouse and normal field conditions was lack of transportation facility (49.94 per cent farmers) which was ranked ninth. Sharma *et al*., 2014 [23] and Kumar *et al*., 2016 [10] opined that lack of MSP, high price fluctuations, lack of market information, high cost of transportation, malpractices in weighing and heavy losses of vegetables were major problems in marketing of vegetables.

**Table 3:** Constraints in marketing of vegetable under polyhouse and normal field condition

| Problems reported by the farmers | Respondents (Number) | Total score | Total mean score | Rank |
|---|---|---|---|---|
| High price fluctuation | 120 | 7067 | 58.89 | 2 |
| Lack of minimum support price | 120 | 7257 | 60.47 | 1 |
| Lack of market information | 120 | 6891 | 57.42 | 4 |
| Lack of transportation facility | 120 | 5993 | 49.94 | 9 |
| Heavy market loss | 120 | 6208 | 51.73 | 8 |
| Lack of suitable cold storage facility | 120 | 6916 | 57.63 | 3 |
| High cost of transportation | 120 | 6802 | 56.68 | 5 |
| Lack of quality packing material | 120 | 6369 | 53.07 | 7 |
| Malpractices in weighing | 120 | 6708 | 55.9 | 6 |

**Source:** Field survey, 2016

It can be seen from the study that there is no MSP for the vegetables. Another problem was high price fluctuation leads to low price for their produce at the time of harvesting and seasonal glut. Due to the lack of Market information, farmers are confused and unable to make decision regarding the place and market where to sell their produce. Market information is more important from the producers' point of view as it gives them an idea about the prevailing price of the produce in the market.

## Conclusions

Overall, the results of constraints in production and marketing of vegetables under polyhouse and normal field conditions in Jaipur district of Rajasthan indicated that infestation of insects, nematodes and diseases and short life of polythene sheet were major constraints and scarcity of labour and lack of availability of quality seeds were the least problems in production of vegetables under polyhouse condition whereas, attack of insects, pests and diseases and high cost of fertilizer accounted as major constraints and high cost of labour and scarcity of labour recognised the least problems in production of vegetables under normal field conditions. In case of marketing of vegetables under polyhouse and normal field conditions, lack of Minimum Support Price and high price fluctuation amounted to a high level whereas, heavy market loss and lack of transportation facility were least problems. There should have to be continuous monitoring and proper regulations of the market practices in the polyhouse cultivation vegetables so that neither the producers prices may touch the floor price nor the consumer price may touch the ceiling in the market. The Government should encourage small agro-processing units in the producing to avoid glut, which may not only reduce post-harvest losses but also generate employment in the rural areas and helps in better price realisation.

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