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Garrett's ranking analysis of problems and constraints in the cultivation of cash crops in Sirmour district of Himachal Pradesh

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Abstract

The study was carried out to examine the production& utilization pattern and problems & constraints faced by farmers and middlemen. A random sample of 60 farmers was chosen for the study. The major findings revealed that high cost of material inputs associated with incidence of pest and diseases were the major problems faced by farmers raising cash crops. Lack of scientific storage facilities followed by inadequate training of farmers for the adoption of better post-harvest management and adverse weather conditions during harvest were the major problems relating to post-harvest management of vegetables. Location of vegetable collection points at distant place and non-remunerative price for the produce coupled with lack of link roads to farmers' villages and blockade of roads during rainy reason were reported other major problems by farmers in marketing of vegetables. Lack of scientific storage facilities followed by lack of grading standards and no premium price for graded produce, more weight loss of produce during transportation, etc were the major problems faced by the local youth traders of vegetable producing villages. The study suggested that quality material inputs such as seed, fertilizers and pesticides from truthful agencies along with extension services need to be made available to the farmers at reasonable cost.

Key words: Garrett ranking, cash crops, vegetable producers, traders, problems, constraints.

Vegetables are the main source of vitamins and minerals. Since, majority of the population in India is vegetarian; therefore, there is an urgent need to increase production of vegetables. Vegetables' farming seems to be a good replacement for the paddy-wheat rotation, as vegetable crops give high returns per unit of area as compared to rice and wheat (Sharma *et al*., 2000). In the world, India occupies first position in the production of cauliflower, brinjal & peas, second in onion and third in cabbage (Pandey *et al*. 2004).

Agriculture in Himachal Pradesh has passed through a long way during the past four decades. The non- viability of land holding especially with marginal and small farmers, the stagnant productivity of traditional crops, livelihood security concerns, rising incomes, changing food habits & consumption patterns and access to modern technological options have tempted the farmers to shift to new crops in the state. Earlier, the commercial cultivation of vegetable crop was confined to selected pockets in the mid and high hills of the state where peculiar advantages prevailed for producing off- season vegetables. However, the vegetables based agricultural diversification has expanded to new areas in the low and mid hills after the early 1990s. This has stimulated a momentum in the production of vegetables in the state. Many new developments such as protected cultivation, emphasis on micro irrigation, organic agriculture and cultivation of more lucrative crops have added new dimensions to the agriculture in the state. The state of Himachal Pradesh offers enormous opportunities to produce vegetable crops as it has several inherent and unique advantages in terms of agro-climatic conditions and rich biodiversity. However, local varieties, rain fed production,

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improper input-mix and traditional practices characterize the present status of agricultural technology in the state. Despite all, the area under vegetable crops in the state has increased from 49.86 thousand hectares in 2005-06 to 76 thousand hectares in 2018-19. Consequently, the production of vegetables which was 9.30 lakh tonnes in 2005-06 has gone up to 17.22 lakh tonnes in 2018-19 (Anonymous, 2019). Ginger, tomato, cauliflower, cabbage, garlic, beans, potato and capsicum are important cash crops, which bring profitable returns to the growers. With this background, a study was carried out in district Sirmour to analyse the problems and constraints faced by cash crops producers and market middlemen with appropriate policy interventions.

Methodology

The study was carried out in five villages which were adopted for holistic development in the area of education, health, agriculture, livestock and enterprises by the Eternal University, district Sirmour of H.P. Two stage stratified random sampling was used to select a sample of villages and the farmer beneficiaries. A complete list of farmer beneficiaries along with their size of holding was prepared in all selected villages. Out of these lists, a random sample of 60 farmers was chosen through proportional allocation method as described below:

$$n_i = \frac{N_i}{N} \times n \qquad i = 1, 2, 3, \ldots, 10$$

Where, n_i = Number of farmers to be sampled in i^{th} village

N_i = Total number of farmers in i^{th} village

N = Total number of farmers in all the 5 villages

n = Total sample size to be chosen i.e., 60 under present study

To analyse the problems &constraints in cultivation and marketing of vegetables, Garrett's ranking technique was employed (Christy, 2014). Basically, it gives the change of orders of constraints and advantages into numerical scores. The major advantage of this technique as compared to simple frequency distribution is that the constraints are arranged based on their importance from the point of view of respondents. Hence, the same number of respondents on two or more constraints may have been given different rank. Garrett's formula for converting ranks into per cent is given by:

$$\text{Per cent position} = \frac{100 \times (R_{ij} - 0.5)}{N_j} \quad \frac{100 \times (R_{ij} - 0.5)}{N_j}$$

Where,

R_{ij} = Rank given for i^{th} problem by j^{th} individual

N_j = Number of problems ranked by j^{th} individual

The per cent position of each rank was converted into scores referring to the Garrett's ranking table given by Garrett and Woodsworth (1969). For each factor, the scores of individual respondents were added together and divided the total number of the respondents for whom scores were added. These mean scores for all the problems were arranged in descending order, ranks were given and most important factors were identified. Finally, these problems were clubbed into high, medium and low severity levels under different aspects as follow (Chauhan, 2000):

Mean ($\bar{X}$) plus standard error and above: High

Mean ($\bar{X}$) plus/ minus standard error: Medium

Mean ($\bar{X}$) minus standard error: Low

Results and Discussion

Production and utilization of cash crops

The production and utilization pattern of crops presented in Table 1 shows that production of garlic was the highest (rank I) of 22.37 q per farm followed by 18.93 q (rank II) of tomato. The garlic produced in district Sirmour was exported to Tamilnadu (65.45%), Kerala (8.00%), Delhi (5.01%) and Gujarat (1.98%) markets. Bean, green pea and capsicum were the next in order. In terms of marketable surplus as percentage of total production again garlic and tomato maintained the same ranks. The produce kept for home consumption was the highest of beans (20 kg per farm and stood at first rank) with as low as 5 kg of capsicum. French bean is the crop which was gifted most to the nears & dears, friends and relatives due to its more comparative shelf life and thus attained highest rank. Perusal of table further reveals that tomato is one of the most important crops of the area which attained 2nd rank throughout.

Table 1. Production and utilization of cash crops

Sr. No.	Crop	Production (q/farm)	Rank	Marketable surplus as %age of production	Rank	Home consumption (kg/farm)	Rank	Gift(kg/ farm)	Rank
1	Garlic	22.37	I	99.12	I	9	IV	9	IV
2	Tomato	18.93	II	97.99	II	19	II	14	II
3	Bean	9.86	III	96.15	IV	20	I	15	I
4	Green pea	5.48	IV	95.07	V	15	III	10	III
5	Capsicum	4.42	V	97.29	III	5	V	4	V

Problems faced by farmers

An investigation was carried out in the main cash crops growing areas of the selected district to understand the problems of farmers with regard to production, post-harvest management and marketing. Category-wise responses of respondents were analysed using Garrett's ranking technique. The results presented in Table 2 show that in case of problems relating to production of vegetables, high cost of inputs (seed, fertilizer, pesticides etc.) was ranked highest problem faced by the farmers with average Garrett's score of 62.66. Similar problems were highlighted by Oraon *et al*. (2018). High incidence of pest and diseases was ranked the second important problem in the study area. These two problems were listed in the category of the most severe based on further statistical analysis using means and standard errors. Stray and wild animal, monkey menace and poor quality of seed were ranked problems of medium level with Garrett's average score of 42.36 and 42.10. The production related problem reported by farmers was non availability of credit which was ranked lowest with an average score of 40.56 and rated at low severity level.

The analysis with regard to problems relating to post-harvest management of vegetables shows that lack of scientific storage facilities for perishable vegetables like tomato, capsicum and semi-perishable vegetables like peas, beans and garlic was the most prominent problem which was ranked with mean Garrett's score of 56.55. This was reported to be the most severe problem. It was followed by lack of training facilities like use of zero energy cool chambers for post-harvest management of vegetables with average Garrett's score of 49.58 (rank II) on all farm situations. The next prominent problem but of low level in post-harvest management of vegetables was adverse weather conditions during harvest of vegetables withan average Garrett's score of 44.93 (rank III).

In case of problems relating to marketing of produce, location of collection centers at distant places was the most prominent problem with mean Garrett's score of 66.75 on all farm situations. The next pertinent problem was non-remunerative price for the crop. These two problems together were reported to be the most serious problems and were in line with the problems reported by Singh and Sidhu, 2015. Lack of link roads to the villages and farm fields and road blockade during main marketing season (rainy season) were the medium level problems with average Garrett's score of 43.26 and 43.11, respectively. The problem of lack of market information was also noticeable in the study area as judged from respective Garrett's score of 32.66 (rank V).

Problems faced by traders

The Garrett ranking analysis for marketing problems faced by vegetable traders of the study area were analysed and results are presented in Table 3. The table reveals that among the different problems, lack of scientific storage facilities was the most prominent problem faced by the traders and rated at number one as indicated by mean Garrett's score of 69.00. The problem of road blockade during marketing season on account of rainy season was ranked second based on mean Garrett's score of 61.00. The other problems faced by traders were lack of grading standards and no premium price for graded produce, more weight loss

of produce during transportation and labour scarcityand high wage rate were ranked third, fourth and fifth on the basis of average Garrett's score values of 49.00, 42.80 and 27.20, respectively.

Table 2. Problems faced by growers on different aspects of vegetable farming

(Garrett's score)

Sr. No.	Particulars	Sum of the scores	Mean	Rank	Severity level
1.	**Production problems**				
i.	High cost of inputs (Seed, fertilizer, pesticides etc.)	3760	62.66	I	High
ii.	High incidence of pest and diseases	3730	62.16	II	
iii.	Stray/ wild animals and monkey menace	2542	42.36	III	Medium
iv.	Poor quality of seed	2526	42.10	IV	
v.	Non availability of credit	2434	40.56	V	Low
Note: Mean = 49.97, Mean + S.E = 60.15 & Mean – S.E = 39.79					
2.	**Post-harvest management problems**				
i.	Lack of scientific storage facilities	3393	56.55	I	High
ii.	Lack of training facilities for post-harvest management of vegetables	2975	49.58	II	Medium
iii.	Unfavorable weather condition during harvest	2696	44.93	III	Low
Note: Mean = 50.35, Mean + S.E = 55.12 &Mean – S.E = 45.58					
3.	**Marketing problems**				
i.	Collection center at distant place	4005	66.75	I	High
ii.	Non remunerative price for the produce	3686	61.43	II	
iii.	Lack of link road to farms/fields	2596	43.26	III	Medium
iv.	Road blockage during marketing season (rainy season)	2587	43.11	IV	
v.	Inadequate of market information	1960	32.66	V	Low
Note: Mean =49.44, Mean + S.E = 62.11& Mean – S.E = 36.77					

Table 3. Problems faced by vegetable traders in study area

(Garrett's score)

Sr. No.	Problems	Sum of the scores	Mean	Ranks	Severity level
1	Lack of scientific storage facilities	345	69.00	I	High
2	Road blockage during marketing season	305	61.00	II	
3	Lack of grading standards and no premium price for graded produce	245	49.00	III	Medium
4	High loss of produce during transportation	214	42.80	IV	Low
5	Labour scarcity and high wage rate	136	27.20	V	
Note: Mean = 49.80, Mean + S.E = 64.32 & Mean – S.E = 35.28					

Summary and Conclusions

The study concludes that garlic cash crop stood at number one with 22.37 q per farm in (give production on per hectare basis) terms of its production followed by 18.93 q (rank II) of tomato. Because of its high-quality nutrients and easy peeling property of cloves, the garlic of district Sirmour was exported to Tamilnadu (65.45%), Kerala (8.00%), Delhi (5.01%) and Gujarat (1.98%) states. The high cost of material inputs associated with incidence of pest and diseases were the major problems relating to production of vegetables. Lack of scientific storage facilities followed by inadequate training of farmers for the adoption of better post-harvest management practice and adverse weather condition during harvest was the major problems relating to post-harvest management of vegetables. Location of collection points at distant place and non-remunerative price for the produce coupled with lack of link roads to farmers' dwellings and blockade of the only single road during rainy reason were reported the major problems faced by farmers in marketing of vegetables. The lack of scientific storage facilities followed by road blockade during the rainy & major marketing season, lack of grading standards and no skimmed price for graded produce, more weight loss of produce during transportation, etc. were the major problems faced by the traders.

Based on findings, the study suggested that there is a need to carry out research with respect to control of pest and diseases infestation particularly with respect to capsicum and tomato crop. Lack of storage facilities followed by lack of training to reduce storage losses particularly in garlic crop was another problem faced by the vegetable producers. Therefore, appropriate measures be adopted to build up storage infrastructure in the area may be at cooperative or community level to facilitate the system. The quality material inputs such as seed, fertilizers and pesticides from truthful agencies along with extension expertise need to be made available to the farmers at reasonable cost. Rural road network in the study area was found to be poor, thus, there is a need to improve the rural roads network so that the farmers may easily dispose of their produce without any hindrance and on time. There is a need to supply latest market information to the farmers with respect to arrivals and prevailing prices in the market.

Conflicts of interest: The authors declare that there is no conflict of interest in this research paper.

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