Research Article

Identification and Prioritization of Issues in Growing and Marketing Vegetables in Punjab Province of Pakistan

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Abstract | Vegetables are distinctively important to meet our daily food intake and provide immunity against various chronic diseases as they are rich source of minerals and vitamins. The annual vegetable production of Pakistan is about 10 million tons which adds almost $170 million in national economy. Unluckily, this production is far below than its required amount due to production, protection and marketing problems which are faced by the vegetable growers. Therefore, the present study was designed to identify and prioritize the production, protection and marketing problems faced by the vegetable growers for suggesting possible solutions. Faisalabad Sadar Tehsil was selected as a study area where the vegetables are intensively grown by the farmers. There were total 58 rural union councils in Faisalabad Sadar, out of which 6 were selected through simple random sampling. From each selected union council, one village was selected at random and from each selected village, 20 vegetable growers were selected randomly thus making a sample size of 120 respondents. A well-planned interview schedule was prepared for the collection of data from the selected respondents. The survey showed that major problems of the vegetable production were the labour shortage, high prices of fertilizers and chemicals. The protection problems identified were lack of storage facilities for surplus vegetables, fluctuation in market price of vegetables and transportation problems. This indicated that the government should launch small credit schemes and should provide better marketing facilities to the farmers to ensure the sustainable production of vegetables in this area.

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1. Introduction

Vegetables are of prime importance in agriculture sector of Pakistan. Potato, onion, chilies, and tomatoes have a share of 95.4, 19.9, 21.1, and 15.9% in vegetable production, respectively in the Punjab, Pakistan. In Pakistan, cropped area is 22.40 million hectares, the vegetable area is consisted of 0.41 million hectares and 13.67 million tons of fresh vegetables are produced each year (Khokhar, 2014). Globally, vegetable production has grown by about 60% over the past 20 years, especially with widespread per capita growth. This trend is very strong in developing countries. One percent of the world's total agricultural area is covered with vegetables. Central Asian and European regions are extensively contributing in

vegetable production with 12% area followed by Caucasus and Turkey which account for 3% of the world's total vegetable production. Vegetable production in the regions of Central Asia and Europe was 136 million tons. (FAO, 2010).

Vegetables are grown in Rabi (October-February) and Kharif (June-September) seasons in most parts of Pakistan. Major vegetables of Rabi season are potato (*Solanum tuberosum* L), onion (*Allium cepa* L) and cauliflower (*Brassica oleracea* var. botrytis) while tomato (*Solanum lycopersicum* L), bitter gourd (*Momordica charantia* L), chilies and brinjal (*Solanum melongena* L) are grown in Kharif season (Government of Punjab, 2016). The main vegetables grown in Pakistan are potatoes, onions, peppers, tomatoes, radishes, ginseng, cauliflower, peas, and pumpkin, which make up 78% of the total area of vegetables and 81% of the total production. With normal metabolic activity, minerals are very much needed dietary ingredients, and vegetables are an excellent source of minerals. Vegetables also contain other valuable ingredients that can strengthen and restore your body. Their parts, such as leaves, stems, fruits and edible roots, have different uses. These vegetables are "natural nutrients given to mankind by the Almighty God" (Hanif et al., 2006).

In recent years, Pakistan has increased its dependence on imported vegetables, especially those imported from India, which imports $200 million annually (Abbasi, 2014). Pests and diseases are important factors restricting the production of vegetables in Pakistan. The incidence of disease varies with changes in the environment. Because farmers prefer to grow vegetables in the dry season rather than the rainy season, farmers usually spray pesticides in the dry season. Compared with pests and diseases, many sprays are used to control insects, which indicates that dry season pests are more serious. Nevertheless, about 90% of the interviewed farmers use chemical pesticides, which confirms that they are not proficient in pesticide treatment. Lack of knowledge about pesticide management can be even more dangerous, as most farmers who grow vegetables have low education and most of them come from rural areas with limited resources (Abang et al., 2013).

When farmers use pesticides, they do not understand the effects on human health and the environment (Mathews, 2008; Ngowi et al., 2007). Modern technologies and trainings provided to the farmers enhance their capacity building in growing the vegetables which increases their awareness and decreases the problems regarding quality and production of heavily contaminated vegetable crops (Al-Shadiadeh, 2007).

The marketing margins of several vegetables shows that the net margin available to the farmer is very low. On the other hand, the middleman involved in various marketing activities earn more than the farmers. The direct marketing of vegetables by the farmers can increase their share in the consumer rupee (Khan et al., 2005).

Therefore, in view of the above facts, the current study was conducted to evaluate i) the problems faced by vegetable growers in production, protection, and marketing, ii) to determine the grower's priority in order to resolve production, protection and marketing constraints, and iii) to compile suggestions for policy recommendation of problems in production, protection, and marketing for extension organization.

2. Materials and Methods

Faisalabad is recognized as the third big city of Pakistan comprising six tehsils viz., Faisalabad Sadar, Faisalabad City, Chak Jhumra, Samundri, Tandlianwala, and Jaranwala (DOA, 2008). Due to limited budget and resources, this research was conducted in Tehsil Faisalabad Sadar. Six Union councils were selected through simple random sampling and from each union council, one village was selected. Twenty vegetable growers were selected on random basis, thus making a sample size of 120 respondents. An interview schedule was prepared for data collection. The observation tool was adopted for studying qualitative analysis. The data were analysed through statistical package for social sciences (SPSS). Likert scale was used to draw conclusion and infer recommendations. The scale was divided into five levels viz., 1= very low, 2= low, 3= medium, 4= high and 5= very high.

3. Results

3.1 Constraints regarding land preparation, fertilizer application and marketing of vegetables

3.1.1 Land preparation

Land preparation is very important aspect in vegetable

production as it significantly influences yield. Respondents were asked about constraints regarding land preparation. Data revealed that expensive mechanization was ranked at 1st position (Table 1) having mean value 4.25 tending more towards high category in spite of very high and small land holding at 4th position (2.76) which existed in mid of low and medium category but tending more towards medium (Table 1). Labour shortage was ranked at second (3.92) while technical knowledge was ranked at third position (3.60).

Table 1: Ranking, score, mean and standard deviation of constraints regarding land preparation, fertilizer application and marketing of vegetables.

Problems	Ranking	Score	Mean	S.D
Land preparation				
Expensive mechanization	1	480	4.25	1.11
Labour shortage	2	357	3.92	1.19
Technical knowledge	3	270	3.60	1.22
Small land holding	4	47	2.76	1.03
Fertilizer application				
High prices of fertilizer	1	492	4.51	0.73
Finance shortage	2	457	4.27	1.03
Adulteration of chemicals	3	320	3.94	0.93
Monopoly of dealers	4	317	4.01	0.81
Availability of fertilizer	5	141	3.13	1.08
Marketing of vegetables				
Distant markets	1	371	4.17	1.06
Low storage facilities	2	324	3.56	1.43
Monopoly of middle man	3	322	4.08	1.03
Less price of vegetable in markets	4	302	3.87	1.38
Shortage of transport	5	300	3.70	1.17
High storage cost	6	292	3.36	1.37
High carriage and other handling charges	7	282	3.86	1.27
High market committee fee	8	250	3.21	1.23
Late payment by the dealers	9	242	3.36	1.41
Information about market prices	10	229	3.37	1.27

*Ranking: Shows priorities of farmers.

3.1.2 Fertilizers application

The fertilizer data showed that high prices of fertilizer were ranked first with highest mean (4.51) (Table 1), which was in mid of high to very high category, but it was found that it tended more towards very high category. Awareness regarding recommendation lay at the bottom with rank order 7th and mean value 2.30 (Table 1) tended more towards medium category. Finance shortage, chemicals' adulteration, monopoly of dealers, availability of fertilizer and black marketing of fertilizer were ranked second to sixth (4.27 to 3.48) respectively. Use of chemical can possibly be avoided by replacing them with the organic manures which enhance the microbial intensity in the field to disturb the habitats for different pests while improving the soil fertility (Table 1).

3.1.3 Marketing problems

While studying the marketing problems, the relative rank order of different issues faced by the farmers and their relative scores were computed by multiplying the score value allotted to each category of scale with the frequency counts. This explained that the respondents identified many common problems, but their intensity was significantly varying from low to very high (Table 1). Abrupt changes in the market price (97.5 %), location of markets at longer distances (91.3%) and ever-increasing commission charges (88.1%) were the common as well as major problems witnessed by farmers on daily basis. Furthermore, approximately most of the farmers (88.7%) suggested to fix the minimum price for the produce of different crops.

The factor of distant markets was ranked at 1st position among all the major problems regarding marketing of vegetables with mean value of 4.17 which tended more to the high category (Table 1). Low storage facilities, middle man's role, decreased prices of vegetables and shortage of transport were ranked from second (3.56) to fifth position (3.70) respectively. Increase storage cost, increased transportation, increased handling charges, ever-increasing market committee fee, delayed payment by the dealers and information about market prices were ranked from sixth to tenth position having values (3.36 to 3.37) respectively. Information about market prices was laid at the bottom with rank order of 10th (3.37) which falls in medium to high category, but more tendency was witnessed to the medium category (Table 1).

3.2 Priorities to resolve production, protection, and marketing problems of vegetables

3.2.1 Production

The expensive mechanization was ranked at 1st position among all the major problems regarding production of vegetables with mean value of 4.30 and higher tendency was witnessed to the high category (Table 2). Soil salinity was laid at the bottom with rank order

of 11th and mean value of 2.00 with strong tendency towards low category. Finance shortage, high prices of fertilizer, less availability of high yielding varieties, non-availability of disease-free material, monopoly of dealers, lack of technical knowledge, black marketing of fertilizers, water logging and soil erosion were ranked at 2nd, to 10th position (Table 2).

Table 2: Ranking, score, mean and standard deviation of growers' priority to resolve production, protection and marketing problems.

Production constraints	Ranking	Score	Mean	S.D
Expensive mechanization	1	464	4.30	0.78
Finance shortage	2	433	4.12	1.03
High prices of fertilizer	3	432	4.15	1.04
Less availability of high yielding varieties	4	323	3.51	1.42
Non-availability of disease free material	5	307	3.53	1.40
Monopoly of dealers	6	267	3.93	0.87
Lack of Technical knowledge	7	229	3.32	1.16
Black marketing of fertilizers	8	98	3.38	0.82
Water logging	9	76	2.62	1.11
Soil erosion	10	65	2.50	1.30
Soil salinity	11	38	2.00	0.74
Protection constraints				
Higher cost of labour	1	331	3.80	1.35
High cost of pesticide spraying	2	327	3.63	1.24
Plenty of labour for controlling weeds manually	3	298	4.14	0.99
Less availability of insect resistant varieties	4	252	3.36	1.27
Health hazards	5	243	3.42	1.25
Less awareness about cultural control methods	6	167	3.63	1.32
Less adoption of intercropping	7	131	3.05	1.27
Excessive use of pesticides	8	110	3.24	1.02
Lack of awareness regarding chemical control methods	9	107	3.06	1.06
unnecessary use of chemicals	10	87	2.64	1.14
Lack of Information about cultural control methods	11	326	3.00	0.78
Less adoption of crop rotation	12	67	2.31	1.00
Marketing constraints				
Low storage facilities	1	341	3.92	1.22
Distant markets	2	340	3.58	1.36
Shortage of transport	3	319	3.75	1.24
Less price of vegetable in markets	4	317	3.91	1.06
High fluctuation in market prices	5	271	3.82	1.16
Late payment by the dealers	6	236	3.58	1.20

*Ranking: shows priorities of farmers.

3.2.2 Protection

The higher cost of labour was ranked at 1st position among all the major problems regarding protection of vegetables with mean value of 3.80 along with tendency to high category (Table 2). Less adoption of crop rotation was laid at the bottom with rank order 12th and mean value 2.31 with tendency to low category. High cost of pesticide spraying, plenty of labour for manual control of weeds, less availability of insect resistant varieties, health hazards, less awareness about cultural control methods, less adoption of intercropping, excessive use of pesticides, educational lacking to use chemical control methods, injudicious use of chemicals and absence of information about cultural control methods were ranked at 2nd to 12th position with mean value 3.63 to 3.00 respectively (Table 2).

3.2.3 Marketing

The low storage facilities were ranked at 1st position among all the major problems regarding marketing of vegetables with mean value of 3.92 while higher tendency was to be considered in high category (Table 2). Late payment by the dealers was laid at the bottom with rank order 6th and mean value 3.58. Distant markets, shortage of transport, fewer prices of vegetable in markets and high fluctuation in market prices were ranked at 2nd to 5th (Table 2).

4. Discussion

Major problems in land preparation of vegetable production were expensive mechanization and small land holding. There is lack of government funded subsidized vegetable farm mechanization. The farmer land holdings are small, and the mechanization was much expensive owing to which the farmers are unable to adopt the latest technologies regarding the vegetable production (Din, 2011). Problems regarding vegetable protection were finance shortage which was at highest rank and at the bottom was shortage/black marketing of chemicals.

Moreover, major problem in vegetable production was finance shortage along with the issue of inadequate contact with experts. In addition to this, the other major problems of vegetable production were the non-affordability of farmers to purchase fertilizers owing to high cost and awareness regarding recommendation of fertilizer application. These owed to lack of

government subsidies for fertilizers and less access of farmers to agriculture extension and lack of knowledge about emerging technologies of vegetable production as reported by Khan (1998) that the agriculture productivity is low due to the lack of contact and communication of farmers with extension workers.

The farmers again put shortage of financial aid on first regarding soil preparation and management problem due to which farmers are not able to properly analyse the fertility and productivity status of their land. According to a survey, farmer put salinity problem of soil on its least priority in presence of other problem thus shortage of financial resources stands the leading barrier regarding production of vegetables in small land holding and poor farmers (Shahbaz et al., 2010).

The major problem of vegetable marketing was location of markets as most of markets are located at far distant owing to which farmers are bound to involve middle-men in the selling their produce. In Pakistan, agricultural marketing system involve multiple players (seven to eight) until the produce is delivered to final consumer (Mohy ud Din, 1998). The second most important factor in the marketing was information about the prices of markets as there is no definite system of price display in markets owing to which farmers are defrauded. The middlemen exploit the resources of poor/marginal farmers and handicap them from their legitimate share.

Conclusions and Recommendations

Keeping in view of financial conditions of farmers' government should give subsidy and launch credit schemes (like Bangladesh's Gramin Bank) so that the on-time availability of quality seeds, fertilizers, and pesticides should be ensured to the farmers.

Government should introduce the concept of state-owned agri. input stores. Every person should obtain inputs as per recommendations from agriculture professionals. By this, there will be analysis of land before land preparation which will result in pin point recommendations. At the end, farmer will apply input as required not as per their own desires or malpractice. These stores will significantly help in on time availability of inputs as well as price stability. There will be no involvement of stockists which will eventually help in market regulation.

Illegal compulsory deduction like 'chung', 'munshiana' and waterman charges etc. are made from the sale proceeds of growers. Market committees should effectively and efficiently check these malpractices. To promote the export of vegetable commodities the proper processing, storage, and packaging should be provided. For these measures, government can develop the purchase centres alongside input stores, where produce can be purchased at government rates. Collected produce can be shifted to cold storages at divisional level and market can be regulated for managing supply-demand curve which will favour market price stability. Measures suggested or the other, not taken in history, are need of the hour which are necessary to enhance per capita income in the country.

Authors Contributions

Muhammad Raheel Faiz and Ijaz Ahraf designed the study. Haq Nawaz and Sajid Hussain along with Muhammad Raheel Faiz executed the study. Abdul Qadeer and Muhammad Sajid Mahmood wrote the manuscript. Muhammad Zubair reviewed the manuscript and finalized.

Conflict of interest

The authors have declared no conflict of interests.

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