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Research Article

Prospects and Constraints of Onion Production and Marketing: A Case Study of District Tando Allahyar, Sindh-Pakistan

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Abstract: This study aimed to identify the existing onion production practices and constraints at smallholder farms and profitability of onion in the Tando Allahyar district of Sindh during the year 2018-19. The primary data were collected from 24 randomly chosen onion-producing farmers in village Ibrahim Shah using a pre-tested systematic questionnaire. Descriptive statistics were used to evaluate percentages, frequency, and mean, while the benefit-cost analysis (BCA) method was used to determine onion growers' profitability. Results of the study revealed that the overall average total cost and gross revenue of onion production were (Rs. 115120/acre, Rs. 154875/acre) respectively. The benefit-cost ratio was found to be 1.52 for (variable costs) and 1.35 for (total cost), indicating that onion cultivation benefits farmers in the Tando Allahyar district. The most common and local onion variety grown was Nasarpuri, which was cultivated by 87 % of farmers, along with Hazari and Phulkara. However, the farmers were reluctant to use hybrid seeds due to their inability to withstand high temperatures. The main production constraints for onion growers were high input prices, particularly seed costs, and high labour charges for hoeing and weeding. Similarly, low product prices and high transportation costs were major marketing constraints. Due to a lack of technical expertise with current technology, such as a shortage of cold storage and skilled labor, the marketing of excess produce throughout the year was a significant problem for onion growers. It is therefore suggested that a comprehensive marketing capacity building and Global GAP will improve the quality, productivity and profitability of the farmers and open the channel of export for Pakistan.

Keywords: Onion Profitability, Production & Marketing, Constraints, Tando Allahyar

1. INTRODUCTION

The onion (*Allium cepa L.*) is a monocotyledonous crop that belongs to the Amaryllidaceae family. The onion has been a valuable vegetable crop for people all across the world from ancient times. Onions are seen in an Egyptian mural from around 3000 BC, so it may be concluded that onions were a key food source for Ancient Egyptians. The word "onion" is derived from Latin and means "large pearl." The onion was compared to a pearl not only because of its shape but also because of its high nutritional value [1]. The onion is a widely grown and popular vegetable crop around the world. It is one of the top 15 most widely produced vegetables on the planet [2]. The cultivated onion is one of the most extensively used spices in all households. It is grown in over 170 countries throughout the world and more than 90 % of onions are consumed in the countries where they are grown [3]. Overall onion production in Pakistan is rising; it increased by 35 % from 1.70 million tonnes in 2010 to 2.30 million tonnes in 2021. The major onion-producing districts are Khanewal, Rajanpur, Bahawalpur, Vehari, and Rahim Yar Khan in Punjab; Mirpur Khas, Umerkot, Jamshoro, Sanghar, Matiari, Shikarpur, Nawabshah, Ghotki, Noushero Feroz and Hyderabad in Sindh; Swat, Dir, and Malakand in Khyber Pakhtunkhwa and Nasirabad, Khuzdar, Awaran, Mastung, Kalat and Chaghi in Balochistan [4]. About 104.55 million tonnes of onions were produced worldwide, and Pakistan ranked sixth with a 2.03 % production share. The other seven top onion-producing nations with the production share were India (25.57 %), China (22.69 %), USA (3.65 %), Egypt

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(3.02%), Turkey (2.18%), Iran (1.97%), Bangladesh (1.87 %), Sudan (1.66 %), and Russian Federation (1.74 %) [3].

Onion yield is known to be influenced by a variety of factors such as cultural practices, growing environment, insect pests, and diseases [5]. Poor transportation, a large number of middlemen, inadequate storage facilities, and a lack of farmer's organizations are some of the issues that prevent efficient onion marketing in the research area [6]. The lack of adequate storage facilities, high transportation costs, and market price fluctuations were all major issues in onion marketing [7]. Instability in onion production was caused by erratic weather, variable market prices, and a lack of suitable storage and market facilities, which prevented farmers from making the best decisions on area allocation and increasing farm productivity [8]. To maximize yield, onion seeds are often sown in a nursery and transplanted with a 15 cm row-to-row spacing and a 7.5 cm plant-to-plant spacing [9]. Because onion production is proportional to yield per hectare and area, efforts must be made to boost yields through the use of modern technologies and higher-quality seeds, fertilizers, and other inputs [10]. Onions are generally grown traditionally, with technology passed down from generation to generation. As a result, the focus should be placed on increasing production by replacing traditional processes with more advanced technologies [11]. *Thrips tabaci* (L.) is a significant pest of the crop whose control is necessary for the growth and profitability of onions. Damage from onion thrips can lower bulb output by 23-85 % if they are not removed. It attacks a variety of vegetable crops, inflicting significant economic harm to onion crops. Young leaves are usually chosen, but buds and blossoms are also affected [12]. The key issues of onion production are the absence of HYV onion seed at the appropriate time, onion growers' lack of technical expertise, high prices throughout the cultivation period, and the non-availability of certified fertilizer at the appropriate time [13]. The use of weedicides, better planting and harvesting tools, and other labor-saving techniques are all urgently needed due to the high cost of labor [14].

Tando Allahyar is one of the most fertile agricultural areas in the country. Farmers are crucial to the production of vegetables. Like other cash crops, onions are grown across a wide area, and this district has some of the highest yields in the province. Given the importance of onions in terms of crop output and area, the research was conducted in the Tando Allahyar district with the following specific goals in mind: (i) to identify the existing onion production practices and constraints at smallholder farms; (ii) to find out the costs of onion production and profitability at selected project sites; and (iii) to explore the marketing issues and opportunities of onion growers.

2. MATERIALS AND METHODS

2.1 Description of the study area

This research was conducted in the village Ibrahim Shah of Tando Allahyar district in Sindh province. Tando Allahyar is located 25 miles (40 kilometers) northeast of Hyderabad and serves as a railway hub for the Sindh region (Fig.1). According to the 2017 census, it is the 56th largest city in Pakistan in terms of population. The primary languages spoken are Sindhi, Siraiki, and Urdu. Mangoes are the most popular plantation in Tando Allahyar, and a vast variety of mangoes are grown here. It is one of the most agriculturally productive places in the country. Sugarcane, wheat, onions, and cotton are among the best yielding cash crops grown in the province.

2.2 Sample and sampling size

The sampled area was selected for the study due to a major onion growing area. MOJAZ Foundation (a local NGO), which was a partner in the project titled “Strengthening Vegetable Value Chains in Pakistan (SVVCP), has randomly selected 24 onion-producing farmers at the village, Ibrahim Shah, Tando Allahyar district of Sindh province. The social scientists conducted in-person interviews with the chosen onion farmers.

2.3 Data collection

The study is entirely based on primary data of the crop year 2018-19, which was gathered through personal interviews with chosen respondents using a pre-tested structured questionnaire to obtain the necessary information. Comprehensive data was gathered on production costs, ranging from land

Fig.1. Map of the study area (District Tando Allahyar, Sindh)

preparation to harvest, as well as the materials required in the process. Cultivation costs include both variable and fixed expenditures. Nursery preparation, land preparation, transplanting, farmyard manure, fertilizers, irrigation, plant protection material, and its application, picking, and operation-wise labour utilization are considered variable expenses, whereas land rents are considered fixed costs. Several questions about production and marketing difficulties that farmers face are also included in the questionnaire. Future crop development recommendations and grower appraisals of prospects are also sought.

2.4 Data analysis

The information gathered included both qualitative and quantitative information. The percentages, frequency, and mean were analyzed using descriptive statistics [15]. To achieve the study's aims, the obtained data was edited, summarized, tabulated, and evaluated. Onion production profitability was investigated using gross margin, net return, and benefit-cost analysis [16].

To estimate the cost of onion production, the following equations were used:

$$VC = \sum (X_i P_i)$$
$$TC = TVC + TFC$$

Where,

TC = Total cost of production (Rs. /acre)
TVC = Total variable costs (Rs. /acre)
TFC = Total fixed costs (Rs. /acre)
Xi = Quantity/Number of inputs per acre
Pi = Price of inputs (Rs. /acre)

To estimate the profitability of onion production, the following equations were used:

$$GR = \sum Y_i P_i$$
$$NR = GR - TC$$
$$GM = GR - VC$$

Where,

GR = Gross return (Rs. /acre)
NR = Net return (Rs. /acre)
GM = Gross margin (Rs. /acre)
Yi = Quantity of output (Kg/acre)
Pi = Price of onion (Rs. /kg)

Benefit-cost ratio (BCR)

The benefit-cost ratio (BCR) is a metric that quantifies the relationship between the financial costs and benefits of a project. It is determined by dividing total revenue by total expenditures.

A higher BCR indicates a higher rate of return on investment. If the BCR exceeds the cost, the project is considered a profitable investment. The benefit-cost ratio was calculated using the following formulas.

When we use the total cost,

$$BCR = TR/TC \quad (1)$$

When we use the variable costs,

$$BCR = TR/VC \quad (2)$$

3. RESULTS AND DISCUSSION

3.1 World onion production status

Around 170 countries cultivate onions for domestic use, with some also growing onions for trade. On a global basis, around 5.48 million acres of onions are harvested each year, with just 8 % of this production being traded internationally. The top-ten producing countries contribute 67 % of global production, with Pakistan ranking sixth while India, China and the United States of America produce about 54 % of the world's total onion production followed by Egypt, Turkey, Pakistan, Iran, Bangladesh, Sudan, and the Russian Federation. The world's highest yield per hectare is in the United States of America, followed by Iran and Egypt (Table 1) [3].

3.2 Pakistan onion production status

During 2020-21, Pakistan produced approximately 2305.7 thousand tonnes of onion on 153.8 thousand hectares of land which is higher than in the past, and the production of onion increased by 8.7 percent over the last year [17]. However, the average yield per hectare is still lower than in the past. The main causes of low yield per hectare are low planting density, insufficient fertilizer use, weed infestation, poor seed quality, and low output prices. Similarly, the absence of plant protection measures exacerbates the situation by lowering yields and lowering quality. Pakistan's climatic conditions have a significant impact on onion farming and despite seasonal changes; the overall acreage and production of onions in Pakistan have increased during the last 12 years (Table 2).

Table 1. Leading onion-producing countries in the world

Rank	Country	Area (Million Hectares)	Production (Million Tonnes)	Yield (Tonnes/ha)
1.	India	1.434	26.738	18.6
2.	China	1.085	23.724	21.9
3.	United States of America	0.054	3.821	70.8
4.	Egypt	0.089	3.156	35.5
5.	Turkey	0.07	2.280	32.6
6.	Pakistan	0.148	2.122	14.3
7.	Iran	0.053	2.064	38.9
8.	Bangladesh	0.185	1.954	10.6
9.	Sudan	0.106	1.950	18.4
10.	Russian Federation	0.06	1.738	29.0

Source: FAOSTAT, 2020

Table 2. Status of onion in Pakistan (2010-2021)

Year	Area (000,ha)	Production (000,tonnes)	Yield (tonnes/ha)
2009-10	124.7	1701.1	13.6
2010-11	147.6	1939.6	13.1
2011-12	129.7	1691.8	13.0
2012-13	126.0	1660.8	13.2
2013-14	143.9	1740.2	12.1
2014-15	130.5	1671.0	12.8
2015-16	136.0	1736.5	12.8
2016-17	137.9	1833.3	13.3
2017-18	149.0	2115.2	14.2
2018-19	148.4	2076.0	14.0
2019-20	148.2	2122.0	14.3
2020-21	153.8	2305.7	15.0
Average	**139.6**	**1882.8**	**13.5**

Source: Agricultural Statistics of Pakistan, 2020-21

3.3 Province-wise onion yield status

Table 3 shows the onion yield by province based on ten years of average data (2010-2021). Balochistan has the highest annual onion output, averaging 18.0 tonnes per hectare, followed by Khyber Pakhtunkhwa, Sindh, and Punjab, which had yields of 16.9, 13.0, and 8.7 tonnes per hectare, respectively [17].

3.4 Province-wise share of onion production, yield, and area

Onion is an important crop in all continents with a world area of about 5.48 million hectares and a production of 104.55 million tonnes per year respectively [3]. In Pakistan, when compared to the previous year, there has been a slight decrease in the area but an increase in onion production. In terms of area and production, Sindh has the highest proportion of onions. The average shares of the provinces in the overall area and production are given in Table 4.

3.5 Socio-economic characteristics of onion growers

Farmers' socio-demographic characteristics have a significant impact on farm performance. Age is a very important demographic factor that shows the ability to do work and willingness to make progress and an attitude towards various social and economic aspects of life. Table 5 shows that the average age of farmers was 36.5 years, implying that the majority of farmers in the study area were youths. However, the literacy rate among farmers was extremely low, with the majority (54.2 percent) of onion growers in the study area being illiterate, with an average formal education of 4.9 years. In agriculture, experience is crucial for making the best use of resources, and onion growers had an average of 13.9 years of farming experience. Household size is one of the most important indicators of a farmer's social status, which influences his or her ability to adopt modern farming practices. In the study area, it was discovered that the majority of onion growers had a large family size (12.5 people). The size of a farm has an impact on the efficient use of resources and cropping patterns; 20.8 % of sampled farmers were tenants with no land of their own, while 45.8 % had farms of less than 5 acres, with an average farm size of 4.96 acres. The majority of respondents (67.7 percent) were living in a joint family system, while farming is the mainstay of the people living in the rural areas. Similarly, the

Table 3. Province-wise yield of onion in Pakistan (2010-2021)

(Yield in tonnes per hectare)

Year	Punjab	Sindh	Khyber Pakhtunkhwa	Balochistan
2009-10	8.0	13.4	17.0	18.7
2010-11	8.2	13.6	16.5	18.4
2011-12	8.4	13.3	16.6	18.2
2012-13	8.7	13.9	16.6	18.1
2013-14	7.7	9.4	16.7	21.0
2014-15	8.6	14.0	16.8	18.0
2015-16	6.8	12.9	15.1	18.9
2016-17	8.1	12.1	17.0	18.5
2017-18	7.1	12.4	18.5	14.4
2018-19	8.1	13.6	15.3	14.9
2019-20	10.3	13.5	17.6	19.2
2020-21	14.1	13.5	18.5	17.2
Average	**8.7**	**13.0**	**16.9**	**18.0**

Source: Agricultural Statistics of Pakistan, 2020-21

Table 4. Share of onion acreage and production by province (2020-2021)

Province	Area		Production	
	(000, ha)	(% share)	(000, tones)	(% share)
Punjab	41.7	27.1	587.6	25.5
Sindh	61.2	39.8	826.7	35.9
Kyber Pakhtunkhwa	11.8	7.7	219.3	9.5
Baluchistan	39.1	25.4	672.2	29.2
Pakistan	**153.8**	**100.0**	**2305.7**	**100.0**

Source: Agricultural Statistics of Pakistan, 2020-21

majority (83.3 percent) were full-time farmers while others engaged in occupations aside from farming, such as laborers (12.5 percent) and traders (4.2 percent) respectively.

3.6 Varieties planted by onion growers

Table 6 shows that 87.5 % of onion growers in the study area grew Nasarpuri, followed by Hazari (8.33 percent), and Phulkara (4.6 percent). Due to high consumer demand, as well as high yielding and heat resistance, growers preferred the Nasarpuri variety for cultivation in the study area.

3.7 Onion growers' primary seed sources

Table 7 presented that 37.5 percent of sampled farmers purchased onion seeds from a local market, followed by 29.2 % who obtained seeds from their harvest, and 33.3 % percent who purchased onion seeds from co-farmers in the study area.

3.8 Onion growers' planting and harvesting schedules

Planting time has a big impact on crop yield and growth. The onion crop is sensitive to temperature and rainfall, and the farmers in this study grow onions during the Kharif (rainy) season. Table 8 depicts the study area's nursery sowing, transplanting, and harvesting months. Farmers planted onions in May and June, transplanted them in July and August, and harvested them from October to December. Farmers harvest onions in December to get better prices when market prices for onions are low.

3.9 Onion growers' information sources

The main information sources used by the sampled farmers are depicted in Table 9. More than half of

Table 5. Socio-economic characteristics of onion growers

Variables	Categories	Frequency	Percentage	Mean
Age (years)	≤ 30	08	33.3	36.5
	31-40	11	45.8	
	41-50	02	8.3	
	Above 50	03	12.5	
Educational Level	Illiterate	13	54.2	4.9
	Primary School	02	8.3	
	High School	04	16.7	
	Graduate	05	20.8	
Farming Experience (yrs)	≤ 10	13	54.2	13.9
	11-20	06	25.0	
	Above 20	05	20.8	
Household Size (no.)	≤ 5	05	20.8	12.5
	6-10	07	29.2	
	Above 15	12	50.0	
Farm Size (acres)	Nil	05	20.8	4.96
	≤ 5	11	45.8	
	6-10	04	16.7	
	10 -15	03	12.5	
	Above 15	01	4.2	
Family Type	Joint Family	16	66.7	-
	Single Family	08	33.3	
Occupation	Farming	20	83.3	-
	Laborer	04	16.7	

Source: Field survey data, 2019

Table 6. Percentage distribution of onion growers by variety planted

Onion Varieties	No. of Farmers	Percentage
Nasarpuri	21	87.5
Hazari	02	8.33
Phulkara	01	4.16
Total	**24**	**100**

Source: Field survey data, 2019

Table 7. Percentage distribution of onion growers by seed sources

Source of Seeds	Frequency	Percentage
Own seed	7	29.2
Fellow farmers	8	33.3
Local market	9	37.5
Total	**24**	**100.0**

Source: Field survey data, 2019

the farmers (58.3 %) indicated that they get their information from fellow farmers for agricultural and marketing purposes. Pesticide companies and middlemen were also significant sources of information for the farmers, accounting for 25 % and 16.7 % of the total, respectively.

3.10 Economic analysis of onion production

All forms of costs, such as fixed and variable costs, are included in the cost of production. The level of production/output affects these variable costs. They rise in response to rising output and fall in response to falling output. Fixed costs do not fluctuate in response to changes in output. They only change when the output increases significantly.

3.10.1 Variable costs

Variable costs account for the vast majority of the total cost of any agricultural production system. This includes expenses such as land preparation, seed or seedlings, plant protection materials, manure and fertilizers, harvesting, and labour. All of the inputs were calculated on a per-acre basis. Total variable costs (Rs. 102120/acre) accounted for 88.7 % of the total cost of production, while fixed costs (Rs. 13000/acre) accounted for 11.3 percent. The total cost of production includes land preparation (6.91 percent), seed and sowing operations (9.27 percent), farmyard manure (4.35 percent), fertilizers (12.35 percent), hoeing and weeding (8.95 percent), pesticides and insecticides (5.61 percent), irrigation (7.83 percent),

Table 8. Percentage distribution of onion growers by planting & harvesting months

Months	No of Farmers	Percentage
Nursery Sowing		
May	6	25
June	18	75
Total	**24**	**100**
Transplanting		
July	14	50.0
August	10	41.7
Total	**24**	**100**
Harvesting		
October	10	41.7
November	10	41.7
December	04	16.7
Total	**24**	**100**

Source: Field survey data, 2019

accounting for 25% and 16.7% of the total, respectively.

Table 9. Percentage distribution of onion growers by sources of information

Sources of Information	Frequency	Percentage
Fellow farmers	14	58.3
Pesticides companies	06	25.0
Middle-men	04	16.7

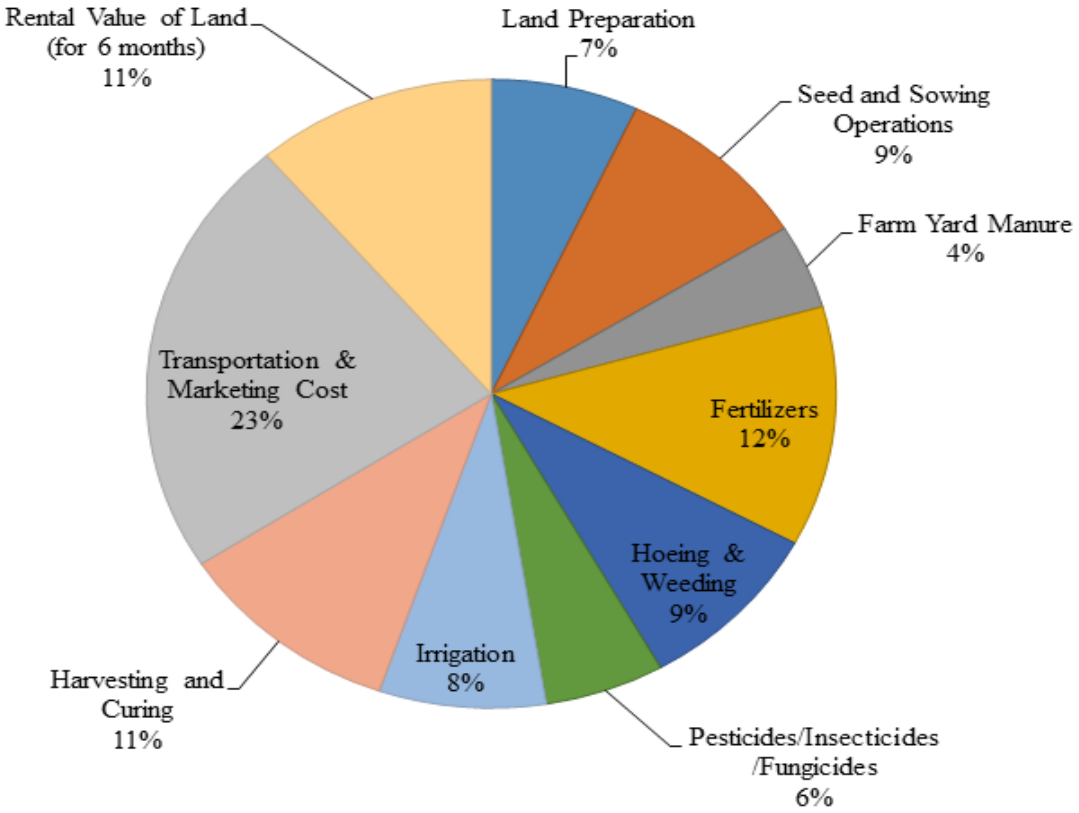

Fig. 2. Percentage distribution of production cost (Rs. /acre) by ingredients Source: Field survey data, 2019

transplanting (5.06 percent), harvesting and curing (10.64 percent), and transportation and marketing cost (22.80 percent). Farmers' highest cost of cultivation was Rs. 14215/acre for fertilizer purchases, followed by Rs. 12250/acre for harvesting and Rs. 10674/acre for seed and sowing operations (Table 10).

3.10.2 Fixed costs

The major component that was considered a fixed cost was the rental value of owned land. Fixed costs are costs that are not affected by the quantity of goods or services produced. They are usually time-related, such as taxes and rent that are paid once a year. Variable costs, on the other hand, are volume-dependent. The average fixed cost of onion production was Rs. 13000/acre in land rent (Table 10).

3.10.3 Total cost

The entire cost of producing onions includes both fixed and variable expenses. The total average cost to produce an acre of onions was Rs. 115120. The average fixed cost was 11.3 %, and the average variable cost made up 88.7 % of the overall cost of producing onions. In per acre onion production, variable costs were eight times higher than average fixed costs (Table 10).

3.11 Gross return, gross margin, net return, and benefit-cost ratio

Table 11 revealed that the total revenue per acre was Rs. 154875 whereas; the total cost amounted to Rs.115120/acre. The average onion yield in the study area was 8260 kg/acre (20.4 tons/ha), which was nominally less than the potential yield (22 tons/ha). The gross margin was found at Rs. 52755/acre while the net return on the total cost per acre was found at Rs. 39755. The gross profit margin was 34 %, which means that for every rupee generated, Rs. 0.66 would go into the cost of goods sold while the remaining Rs. 0.34 would be used to pay back expenses, taxes, etc. The benefit-cost ratio over variable cost was found to be 1.52 and the over total cost was found to be 1.35, indicating that the

onion crop is a profitable enterprise for the farmers and emphasis should be laid on overcoming the constraints impeding the growth of the enterprise. Other researchers discovered similar results with benefit-cost ratios of 1.30 and 1.43 respectively [18, 19].

3.12 Problems and constraints of onion production

The onion growers face some problems with the production and marketing of onion in the study area. To identify the relative importance of the problems and constraints in onion production and marketing, the Simple Ranking Technique has been applied. All the 24 sampled farmers were asked to assign ranks to these problems in order of importance. Each farmer was instructed to indicate the importance of the problem by giving Rank-I to the most important problem, rank II to the second important one, and so on.

3.12.1 Production constraints

During onion cultivation, the farmers in the study areas encountered a variety of issues. To examine the production constraints, eight factors are taken into consideration. Table 12 (a) shows that three major production constraints are high prices of seeds and fertilizers, high labor costs, and weeds mentioned by sampled farmers representing 83.3 %, 79.2 %, and 62.5 % respectively. The other problems faced by onion growers were infestation of insects/pests and diseases, lack of storage facilities, availability of quality seed, lack of technical knowledge, and availability of canal water.

3.12.2 Marketing constraints

The producers' top eight marketing constraints have been identified and presented in Table 12 (b). The problems were ranked based on their priority. The three major marketing constraints are low prices of onions, high charges for transportation, and lack of market information indicated by onion growers representing 95.8 %, 70.8 %, and 54.2 % respectively. The other problems were high packing material cost, exploitation by a middleman, perishability of the product, lack of markets, and transportation problems.

Table 10. Costs of onion production (Rs. /acre)

S. No.	Operations/Inputs	Cost /Acre	Percent
A	**Variable costs**		
1	Land preparation	7956	6.91
2	Seed and sowing operations	10674	9.27
3	Farmyard manure	5007	4.35
4	Fertilizers	14215	12.35
5	Hoeing & weeding	10306	8.95
6	Pesticides/insecticides/fungicides	6458	5.61
7	Irrigation	9010	7.83
8	Harvesting and curing	12250	10.64
9	Transportation & marketing cost	26244	22.80
	Total variable costs (item 1 to 9)	**102120**	**88.71**
B	**Fixed costs**		
1	Rental value of land (for 6 months)	13000	11.29
	Total fixed cost	**13000**	**11.29**
C	**Total cost of production (C= A+B)**	**115120**	**100.00**

Source: Field survey data, 2019

Table 11. Profitability of onion production (Rs. /acre)

S. No.	Particulars	Mean
A	Total cost (Rs./acre)	115120
B	Total variable Cost (Rs./acre)	102120
C	Returns/yield (kgs/acre)	8260
D	Average sale price (Rs./Kg)	18.75
E	Gross returns (Rs./acre) **(C*D)**	154875
F	**Gross margin** (Rs./acre) **(E-B)**	**52755**
G	Gross profit margin (%) **(E-B/E)*100**	34 %
H	**Net return** (Rs./acre) **(E-A)**	**39755**
I	**Benefit-cost ratio** (over variable cost) **(E/B)**	**1.52**
J	**Benefit-cost ratio** (over total cost) **(E/A)**	**1.35**
K	Unit cost of production (Rs./kg) **(A/C)**	13.94
L	Profit (Rs./kg) **(D-K)**	4.81

Source: Field survey data, 2019

Table 12 (a) Onion production constraints faced by onion growers

Production Constraints	Respondents (N=24)		
	Number	Percentage	Rank
High price of seed and fertilizer	20	83.3	1
High labor cost	19	79.2	11
Weeds	15	62.5	111
Infestation of insect/pest and diseases	12	50.0	1V
Lack of storage facilities	10	41.7	V
Availability of quality seed	9	37.5	VI
Lake of technical knowledge	7	29.2	VII
Availability of canal water	7	29.2	VIII

Source: Field survey data, 2019

Table 12 (b) Onion marketing constraints faced by onion growers

Marketing Constraints	Respondents (N=24)		
	Number	Percentage	Rank
Low price	23	95.8	1
High charges of transportation	17	70.8	11
Lack of market information	13	54.2	111
High packing material cost	12	50.0	1V
Exploitation by brokers/middlemen	10	41.7	V
Perishability	10	41.7	VI
Lack of markets	9	37.5	VII
Transportation problems	2	8.3	VIII

Source: Field survey data, 2019

4. CONCLUSION & RECOMMENDATIONS

Pakistan ranked sixth in terms of onion cultivation with about 148.2 thousand hectares and contributes 2.7 % of the onion area and 3.1 % of onion production worldwide. Sindh produces 36 % of the nation's total onion output, followed by Balochistan and Punjab with 29 % and 26 %, respectively. Onions make up less than 10 % of all exports from Pakistan, indicating a large amount of untapped potential.

The majority of farmers grew native varieties, with Nasarpuri being the most common in the study area. Onion growers avoided using hybrid varieties because these varieties were less heat resistant. Despite the outstanding onion yield in the study area, the farmers' ability to keep a high-profit margin was limited by the lower output prices. According to the benefit-cost ratios of 1.52 (for variable costs) and 1.35 (for fixed costs), indicated that onions is advantageous for the farmers in Tando Allahyar district of Sindh.

Production and marketing are difficult for onion growers and the marketing of onions was also hampered by low product prices, high transportation expenses, and a lack of market knowledge. Similarly, weed infestation, labor costs, and fertilizer costs were all mentioned as significant productivity challenges. Furthermore, the growers had no interaction with extension agents and were reliant on the information and advice of other farmers and pesticide agents. The following recommendations can be made based on the study's findings:

1. Market pricing uncertainty contributes to regional instability; the government should intervene to alleviate it.
2. New hybrid varieties that can thrive in hot climates and are pest resistant should be developed.
3. Onion growers must be trained in storage facilities to improve their technical expertise.
4. Comprehensive capacity building program on marketing and Global GAP standards will improve productivity and profitability of the farmers by fetching high prices in the market and leads to export oriented product for Pakistan.
5. Developing smart value chain for onion producers coupled with global market integration will increase efficiency and ultimately profitability.

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6. DECLARATION

The study findings are original; the same material is neither published nor under consideration elsewhere, and if the article is approved for publication, its copyright will be assigned to the Pakistan Academy of Sciences.

7. CONFLICT OF INTEREST

There is no conflict of interest among the authors.

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