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# REVITALIZING OLIVE AGRICULTURE IN PUNJAB, PAKISTAN: UNLEASHING POTENTIAL BEYOND MARKETING AND PRODUCTION CONSTRAINTS

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**ABSTRACT**

The purpose of this research is to find the foremost constraints that were involved in olive production as well as marketing. The present study is carried out in four districts of Punjab province, Pakistan with a focus on olive growers using cross-sectional data of 112 farmers. Our research findings showed that high nursery prices, high labour wages, limited access to the latest production technology, lack of technical workers and lack of water availability to olive growers were found most important production constraints in Pothohar, Punjab Pakistan. In the process of marketing olives, Lack of proper olive market information, lack of storage facilities, and high percentage of fruit losses during collection were the utmost marketing constraints of olive growers. The research put forward that to overcome these production and marketing constraints, to train the farmers and researchers/ extension agents with the production and marketing techniques, provide irrigation facilities at a subsidy rate and open information centres for prices should be available to them at the district level.

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## INTRODUCTION

Pakistan is bestowed with a diverse ecology, favourable conditions, and high-quality soil, a divine gift from Allah, ideal for the thriving commercial cultivation of olives. In Pakistan, about 10 million acres have been identified for suitable olive crops (Akhtar et al., 2021). The Pothohar region in the northeastern nook of the country is being developed as an “Olive Valley” after being recognized as an appropriate area for olive cultivation due to its topography and local weather. Growing olive crops has multiple advantages: olive trees work as a carbon sink to observe the carbon from the environment on one hand and fulfil the local consumption of edible oil on the other hand and tackle the water security challenges efficiently (Jan et al., 2021). By the production of local olive oil in Pothohar Punjab, Pakistan, olive farmers can get huge benefits by sale of olives and its products on the one hand while also contributing to Pakistan's foreign

exchange reserves on the other. Pakistani extra virgin oil is far better than the oil produced in Spain and Italy (Iqbal et al., 2019). Traditional crops in Barani areas of Pakistan are not so productive on barren land, but the olive crop has full potential on barren land due to its drought-tolerant nature and limited water requirements (Anwar et al., 2013).

Having only 20 percent of the domestic production of the total requirement, the country spends approximately US$ 4 billion annually on the import of edible oil to meet the pressing demand of its population (Haq et al., 2021; GoP, 2020). This increasing trend is because of continuous increases in the population and less oilseed crop production (Iqbal et al., 2019; Akhtar et al., 2019). Although the area of olive is increasing day by day the efforts of Pakistan and the Italian government. Still Production is quite low and at low pace due to facing of number of constraints of the olive community in the use of resources and production.

In addition to these constraints, farmers may experience several other challenges in the marketing of olives and their products. Therefore, the focus of this study is to gain a better understanding of the production and marketing constraints faced by olive farmers and feasible solutions can be offered to overcome the constraints in the production and marketing of olive in the study area.

## MATERIAL AND METHODS

### Study area

This research was conducted in four olive-growing district of Punjab province of Pakistan.; Chakwal, Jhelum, Rawalpindi, and Attock during 2020-21. Keeping in view the total share of olive production in Pakistan (Shoaib et al, 2019). These districts were purposefully selected as they constituted the initial areas where the Olive project, 'Developing Potohar into an Olive Valley' under the ADP project, was first implemented in 2015. These districts also ranked first in the province in terms of area under olive and amount of olive production in 2021 (Akhtar et al., 2021).

### Sample Selection

To fulfil the study objective, a multi-stage random sampling technique was used to select the study area and farm household. In first step, Punjab province was selected as the main study area. In the second step, four olive-growing districts were selected. In the third step, we choose 28 olive farms from each district. The total sample size was 112. Yamane's formula (Yamane, 1967) was used for farm household sample selection in the study area, which is given below;

$$n=N/((1+N.e^2)) \quad (1)$$

n = Sample size

N = Total number of farmers in the study area

e = Margin of error, used as ±15% (0.15)

The interview schedule included all the relevant information regarding the socioeconomic characteristics of the farm and farm household, production and marketing constraints faced by the olive farmers. Before the start of the survey, a pretesting was done to avoid missing any essential information. The marketing and production constraints faced by olive farmers were tabulated into frequency tables and expressed in % against each of them. The chi-square test was also applied to check the significance of production and marketing constraints of olive farmers.

## RESULTS AND DISCUSSIONS

### Characteristics of Olive farm and farmers

Table 1 provides descriptive statistics of both olive farms and farmers. Two types of variables were involved in the research area: continuous variables and discrete choice dummy variables. The mean age of olive growers was 52.87, with a 12.7 average schooling year. Average olive orchard land holdings were 8.00 acres with an average of 7.00 years of olive farming experience. From the farm to the main market, the mean distance was 13 kilometres. Barani Agricultural Research Institute, Chakwal works day and night for the betterment of the olive community, and they have no barrier for any farmer to come and learn technical skills from well-trained researchers. Approximately 55 percent of farming communities have physically been in contact with BARI/CEFORT for upscaling of their farms. Barani area people have scattered and small land holdings for cultivation, so they mostly depend on other than agricultural sources of income services, and about 75% have off-farm income sources.

### Production Constraints Faced by Olive Farmers

The findings presented in Table 2 highlighted numerous production constraints associated with olive farming in the Potohar region of Punjab, Pakistan. The most frequent production constraints were high nursery prices (88.39 percent of survey growers) due to the high

demand for imported plants, low access to the latest production information (81 percent of respondents) and less access to technical labour (84 percent of olive farmers) and those who are technical they demand very high wages. Irrigation, the key element in the entire olive crop production strategy, was also found to be a serious problem of the area (73 percent of households) has no proper network of irrigation. This needs due consideration by the line department of the Govt and provision of subsidy on drip irrigation. Where most of the olive growers found these problems are utmost production constraints, followed by problems of Less Profitability in Olives with Competitive Crops (54 percent), Disease and Pest Attacks (54 percent) and Weak Linkages Between Research/Extension Agents and Olive Farmers (50.89 percent of the olive community). These findings are in line with (Bhat et al., 2015) (Bhat et al., 2015). Table 2 also represents the results of Chi-Square. The P-value results showed the significance of production constraints of the olive crops in the study. High Nursery Prices, high Labor Wages, lack of Technical Workers

Disease and Pest Attacks were found to be significant at a 1 percent level of probability whereas High Fertilizer Prices, lack of Irrigation Networks Requirements Water were found to be significant at a 5 percent level of probability and High Fuel Prices, Less Profitability In Olive With Competitive Crops, and Weak Linkages Between Research/Extension Agent And Olive Farmers were found to be significance at 10 percent level of probability results are matching with these studies (Bhat et al., 2015; Oyedele and Yahaya, 2010).

Table 1. Characteristic of Olive Farms and Households.

| Variables | Description | Average | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| Household Age | Age of respondent in years | 52.87 | 8.29 | 30.00 | 74.00 |
| Schooling Years | Years of schooling of respondent | 12.7 | 3.15 | 0.00 | 18.00 |
| Farming Experience | Olive Farming experience over the years | 7.29 | 2.46 | 3.00 | 13.00 |
| Distance from Market | Distance in kilometres | 13.42 | 5.15 | 6.00 | 27.00 |
| Olive Fruiting Orchard Size | Area in Acres | 8.00 | 15.81 | 0.25 | 100.00 |
| BARI /CEFORT/ extension | Dummy CEFORT /BARI services (if yes =1; otherwise = 0) | 0.55 | 0.47 | 0.00 | 1.00 |
| Off-farm income | Dummy off-farm income source (if yes =1; otherwise = 0) | 0.75 | 0.43 | 0.00 | 1.00 |

Table 2. Production Constraints faced by Olive Framers.

| Production Constraints | | Chakwal | Jhelum | Rawalpindi | Attock | Total Observation | |
|---|---|---|---|---|---|---|---|
| | | Frequency | Frequency | Frequency | Frequency | Freq (%) | Chi-square (p-value) |
| High Nursery Prices | Yes | 26 | 22 | 27 | 24 | 99 (88.39) | 3.124*** |
| | No | 2 | 6 | 1 | 4 | 13 (11.61) | (0.000) |
| High Labor Wages | Yes | 22 | 18 | 21 | 27 | 88 (78.57) | 4.543*** |
| | No | 6 | 10 | 7 | 1 | 24 (21.43) | (0.000) |
| Access to the Latest Production Information | Yes | 26 | 22 | 20 | 21 | 91 (81.25) | 8.96* |
| | No | 2 | 6 | 8 | 7 | 21 (18.75) | (0.10) |
| High Fertilizer Prices | Yes | 12 | 8 | 18 | 27 | 65 (58.04) | 10.230** |
| | No | 16 | 20 | 10 | 1 | 47 (41.96) | (0.020) |
| High Fuel Prices | Yes | 25 | 8 | 10 | 15 | 58 (51.79) | 3.542* |
| | No | 3 | 20 | 18 | 13 | 54 (48.21) | (0.053) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Lack Of Technical Workers | Yes | 26 | 25 | 20 | 22 | 95 (84.34) | 43.234*** (0.000) |
| | No | 2 | 3 | 8 | 6 | 17 (15.17) | |
| Lack Of Irrigation Networks Requirements Water | Yes | 22 | 27 | 18 | 15 | 82 (73.21) | 7.689** (0.0512) |
| | No | 6 | 1 | 10 | 13 | 30 (26.78) | |
| Less Profitability in Olive with Competitive Crops | Yes | 20 | 12 | 16 | 13 | 61 (54.46) | 32.798* (0.10) |
| | No | 8 | 18 | 12 | 15 | 51 (45.54) | |
| High Climatic Variation | Yes | 12 | 8 | 7 | 10 | 37 (33.04) | 5.412 (0.84) |
| | No | 16 | 20 | 21 | 18 | 75 (66.96) | |
| Disease And Pest Attack | Yes | 20 | 12 | 16 | 13 | 61 (54.46) | 52.333*** (0.0005) |
| | No | 8 | 18 | 12 | 15 | 51 (45.54) | |
| Poor Knowledge of Extension Agents | Yes | 6 | 1 | 8 | 10 | 25 (22.32) | 5.980 (0.832) |
| | No | 22 | 27 | 20 | 18 | 87 (77.68) | |
| Weak Linkages Between Research/Extension Agents and Olive Farmers | Yes | 22 | 8 | 10 | 15 | 57 (50.89) | 10.22* (0.189) |
| | No | 6 | 20 | 18 | 13 | 55 (49.11) | |

***significant at 1%, **significant at 5%, *significant at 10% level of significance.

**Marketing Constraints Faced by Olive Farmer**

Table 3 findings revealed that due to a lack of market information and a lack of proper market of olives (84% and 73% respectively) farmers could not get the maximum benefit from their crops. Still, Potohar regions have no technical labour, and due to this they lose a high percentage of their crop. They have no storage facilities to store the perishable nature of crops (69%, and 83% respectively) (Dagnew et al., 2014; Sharif et al., 2005). Table 3 further revealed that the variable like High percentage of fruit losses during collection, Lack of Packaging material (29.345), Lack of processing units and cooperative (0.567) societies were found to be positive and highly significant at 1 percent level of probability whereas Lack of olive presses (7.883), Lack of storage facilities (9.987), Perishable nature of the product (9.044) were found to be positive and significant at 5 percent level of probability.

Table 3. Marketing Constraints Faced by Oliver Farmers.

| Marketing Constraints | | Chakwal | Jhelum | Rawalpindi | Attock | Total Observation | Chi square (p- value) |
|---|---|---|---|---|---|---|---|
| | | Frequency | Frequency | Frequency | Frequency | Freq (%) | |
| Lack of proper olive market | Yes | 21 | 23 | 18 | 20 | 82 (73.21) | 3.356 (0.000) |
| | No | 7 | 5 | 12 | 8 | 30 (26.78) | |
| Lack of market Knowledge | Yes | 17 | 26 | 25 | 27 | 95 (84.82) | 4.567 (0.109) |
| | No | 11 | 2 | 3 | 1 | 17 (15.17) | |
| High percentage of losses during collection | Yes | 25 | 21 | 15 | 17 | 78 (69.63) | 5.222*** (0.000) |
| | No | 3 | 7 | 13 | 11 | 34 (30.35) | |
| Lack of olive presses | Yes | 12 | 8 | 18 | 27 | 65 (58.08) | 7.883** (0.05) |
| | No | 16 | 20 | 10 | 1 | 47 (41.96) | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Lack of storage facilities | Yes | 26 | 24 | 21 | 22 | 93 (83.03) | 9.987** (0.054) |
| | No | 2 | 4 | 7 | 6 | 19 (16.96) | |
| Lack of Packaging material | Yes | 20 | 27 | 25 | 22 | 94 (83.92) | 29.345*** (0.000) |
| | No | 8 | 1 | 3 | 6 | 18 (16.07) | |
| Reliance on traditional methods of collection | Yes | 22 | 27 | 18 | 15 | 54 (48.21) | 0.345 (0.987) |
| | No | 6 | 1 | 10 | 13 | 58 (51.17) | |
| Exploitation of the middlemen | Yes | 20 | 18 | 18 | 15 | 71 (63.39) | 0.734 (0.345) |
| | No | 8 | 10 | 10 | 13 | 41 (36.60) | |
| Lack of processing units and cooperative societies | Yes | 8 | 10 | 7 | 10 | 35 (31.25) | 0.567*** (0.000) |
| | No | 20 | 18 | 21 | 18 | 77 (68.75) | |
| Perishable nature of the product | Yes | 20 | 12 | 16 | 13 | 60 (53.57) | 9.044** (0.045) |
| | No | 8 | 18 | 12 | 15 | 52 (46.42) | |

**Suggestions to Overcome Olive Productions and Marketing**

The distribution of olive farmers by their suggestion to overcome the Production and marketing constraints faced by the Pothohar region (Table 4). Government should train the master trainer and farmers about the new production technology and techniques through training cum demonstration was the most important suggestion made by 80 percent of olive farmers. For every crop water is the most important element for proper growth and production, availability of water in the barani area is a critical issue. The government should address this issue and provide subsidies for it. They were 70 percent of farmers demanded drip irrigation facilities and subsidy on it. Also, 67 percent of olive grower shown their interest the government should provide olive mechanical harvesting tools and packing material at a cheap rate. About 66 percent of olive growers demanded the government should provide good quality seedlings at a cheaper rate. The above finding and in close conformity with (Bhat et al., 2015; Oyedele and Yahaya, 2010).

Table 4. Production and Marketing Constraints-Suggestions.

| Suggestions | Frequency | Percentage |
|---|---|---|
| To train the master trainer and farmers about the new production technology and techniques through the training cum demonstration | 93 | 80.03 |
| The government should take the initiative to provide a drip irrigation facility | 79 | 70.53 |
| Harvesting tools and Packing materials should be made available at a reasonable rate | 75 | 66.96 |
| Produce up-to-the-mark olive nurseries to provide the farmers with reputed Research institutes/ Registered nurseries and reduce the volume of imported seedlings. | 74 | 66.07 |
| The government should motivate the farmers to adopt the group market | 67 | 59.82 |
| Government control on middlemen | 58 | 51.78 |
| The government should provide olive presser at the tehsil level | 44 | 39.28 |

**CONCLUSION**

Despite efforts by the Center of Excellence for Olive Research and Training (BARI), Chakwal, to support olive growers and enhance their technical skills, challenges persist. Olive growers in Potohar continue to grapple with significant production and marketing issues. Key constraints include high nursery prices, elevated labour wages, limited access to up-to-date production information, a shortage of technical workers, and inadequate water availability. The biggest marketing constraints they faced were a lack of market information, fruit losses during collection, and the lack of

storage facilities. So that's the Center of Excellence for Olive Research and Training (BARI), Chakwal/ Extension agents should conduct a series of technical training/workshops and farmers' field schools to update and improve the knowledge of olive growers and overcome these constraints.

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