OPEN ACCESS Int. J. Agr. Ext. 11 (02) 2023. 209-214 DOI: 10.33687/ijae.011.002.4831

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Available Online at EScience Press

International Journal of Agricultural Extension

ISSN: 2311-6110 (Online), 2311-8547 (Print)

https://esciencepress.net/journals/IJAE

# AN ASSESSMENT OF PRODUCTION ISSUES OF OILSEED CROPS IN SINDH PROVINCE OF PAKISTAN

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**ARTICLE INFO**

**Article History**

Received: March 26, 2023

Revised: June 21, 2023

Accepted: July 22, 2023

**Keywords**

Oilseed crops

Edible oil

Production

Consumption

Constraints

**ABSTRACT**

Pakistan is the third-largest importer of edible oil in the world after petroleum and machinery. Only 14% of the necessary oil is produced domestically in Pakistan, which is insufficient to meet the country's rising need for edible oils. A study was carried out with 300 farmers to examine the production of oilseed crops and their marketing challenges in Sindh province. According to the report, the oilseed crops grown by the respondents were mustard and sunflower, with mustard being more popular. The cultivated land was 41.82 acres larger than the average farm size of 46.76 acres, indicating a high cropping intensity. The average yields of oilseed crops were, however, lower than those of other crops, and farmers were especially concerned about the prices of oilseed crops. Based on the survey results, suggestions were made to increase the profitability of oilseed crops for farmers, including the provision of reasonably priced hybrid seeds, advancements in production technology, greater rates of output, the introduction of oilseed crop support pricing, and better water management. Additionally, it was advised to target coastal farmers for non-traditional oilseed crops, supply inputs for growing on uncultivated lands, and identify cropping zones for oilseed production.

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## INTRODUCTION

When taken in the right amounts, edible oils play a critical role in human nutrition by supplying the essential fatty acids required for normal, healthy growth and development. Particularly prized agricultural goods include plant oils (Sharma, 2017). Oilseed crops, which account for a sizeable fraction of the total output, are strongly reliant on the production of edible oil (Msanne *et al*., 2020). Mostly due to their economic importance, oilseed crops are a lucrative and widely grown commodity worldwide. These crops are primarily grown for their preparation of edible oils, and many oilseeds' meals can be used as a high-protein ingredient in animal, poultry, and fish feed. Due to the rising demand for vegetable oils, animal and poultry feed, drugs, biofuels, and oleochemicals, oilseeds have grown in popularity recently (Adeleke and Babalola, 2020). In Pakistan, cottonseed, rapeseed, mustard, canola, sunflower, and soybean are the main sources of cooking oil. Oilseeds play a vital role in domestic human nutrition, ranking only after grains and sugar crops, and providing 2.5 times the energy of proteins and carbohydrates. Edible oils are a crucial component of the human diet, containing essential fatty acids necessary for healthy growth and development. It is recommended that one-third of daily calories come from fats and oils for a

healthy lifestyle. Vegetable oils are derived from plants, with seeds being the primary source of these oils. Oilseed crops are a significant source of animal and human nutrition and industrial products, and biodiesel production has been increasing day by day (Ahmed *et al.,* 2021).

Pakistan ranks eighth globally in terms of cooking oil consumption, with per capita vegetable oil consumption rising from 5.31 kg in 1973-74 to 20 kg in 2018, and an expected further increase to 22 kg by 2028. The increase in per capita consumption of cooking oil can be attributed to population growth and changing dietary habits due to factors such as rapid urbanization, economic growth, and the popularity of fast food and hotel culture (Holmboe-Ottesen and Wandel, 2012). The high consumption of cooking oil in Pakistan is mainly due to its extensive use in the country's cuisine. Pakistan stands as the third-largest importer of cooking oil globally, with cooking oil ranking third on the country's list of imports, after petroleum, petrochemicals, and machinery. Until the 1960s, Pakistan had sufficient reserves of cooking oil (Aftab *et al*., 2021). Furthermore, it is estimated that 10 to 15 percent of all edible oil is utilized by industries that produce cosmetics, paint, and other related items. Afghanistan is the primary destination for more than 200,000 tons of cooking oil and vanaspati ghee exports, with smuggling through the borders not being accounted for in this estimate.

In Pakistan, only 14% of the total consumption of cooking oil in 2021 was produced domestically, while the remaining 86% had to be imported. During the July-March fiscal year of 2022, the total availability of cooking oil from all sources in Pakistan was estimated at 3.214 million tonnes, out of which only 0.460 million tonnes were domestically produced. To meet the demand, Pakistan imported 2.754 million tonnes of food and seed oil, incurring a cost of Rs. 662.657 billion (US$3.681 billion) (GoP, 2022). However, if the demand continues to rise by 5% each year, coupled with a 5% increase in world market prices, the cost of imports could escalate to Rs. 757 billion by 2025 (Aftab *et al*., 2021).

## MATERIALS AND METHODS

### Study Area

The present study was selected from three zones of Sindh province based on upper, middle, and lower Sindh. One district in each zone was selected for the study. Shikarpur, Naushahro Feroze, and Thatta were chosen as the three districts after considering the acreage and output of oilseed crops in Sindh in general and specific zones in particular. According to the Government of Pakistan's report for the year 2021-22, the cultivation of rapeseed and mustard crops resulted in a production of 457 metric tons from an area of 430 hectares in Shikarpur district. In Naushero Feroze district, the crop was cultivated on 1,235 hectares, yielding 1,216 metric tons, while in Thatta district, it was cultivated on 2,749 hectares, with a yield of 2,380 metric tons. In the Shikarpur district, the sunflower was cultivated on 50 hectares and produced 61 metric tons, whereas, in the Naushero Feroze district, it was cultivated on 4 hectares and produced 5 metric tons. In Thatta district, sunflowers were cultivated on 17,529 hectares, yielding 18,331 metric tons (GoP, 2022).

### Targets, Samples, and Sampling Techniques

Multistage sampling was used to ensure the selection of representative samples of responders. In the first stage, three districts were selected from the upper, lower, and middle zones in Sindh province. The second stage involved the selection of one taluka in each district based on the area coverage of oilseed crops. In the third stage, two union councils were selected in each taluka, and five villages were selected in each union council in the fourth stage. Finally, a total of 10 farmers were scheduled to be interviewed in each village to gather insights into their production and marketing challenges. In total, 300 farmers were subjected to interviews. Data was collected between 2021-2022.

### Data Analysis

Initially, the data were arranged and organized in a coding system using the coding sheet and then summarized and analyzed using Microsoft Office Excel and SPSS (Statistical Package for Social Science) computer software. SPSS was used to analyze the data by determining the frequency, mean, standard deviation, standard error, and other ranks.

## RESULTS AND DISCUSSION

### Socioeconomic characteristics of the farmers

In Figure 1, the data indicates that the respondents' age distribution was as follows: 5.33% fell within the 15-30 years range, approximately 45.00% were aged between 31-45 years, 49.00% were in the 46-60 years age

bracket, and a mere 0.67% of participants in this survey were aged above 60 years. Most respondents (95.67%) were married, while the remaining 4.33% were single. Among the respondents, 11.00% had completed primary education, 18.67% had completed middle school, 22.33% had obtained a secondary school education, and 16.67% had completed intermediate education. Among the respondents, the highest educational achievement was graduation, representing 10.33% of the total. On the other hand, the second-highest proportion of farmers, accounting for 21%, were categorized as illiterate. In terms of occupation, self-cultivators made up the majority with 67.6% of the respondents, while 23.00% identified themselves as landlords. The remaining 9.33% of participants were classified as tenants. Due to agricultural and socioeconomic limitations, the expansion of oilseed crop cultivation in Pakistan has been uneven, despite its introduction 40 years ago (Rana *et al.,* 2022). The study focused on determining respondents' ages through birthdate calculations for interviews. It cautioned against generalizing foreign research findings on oilseed agricultural adoption due to varying socio-economic and cultural contexts. A comprehensive understanding of current oilseed adoption is crucial for promoting ecological agricultural practices. Recognizing influential variables on oilseed adoption is essential. Understanding the link between farmers' traits and adoption behaviour aids planners in encouraging technology-wary farmers to engage more actively (Dunford and Zhang, 2003).

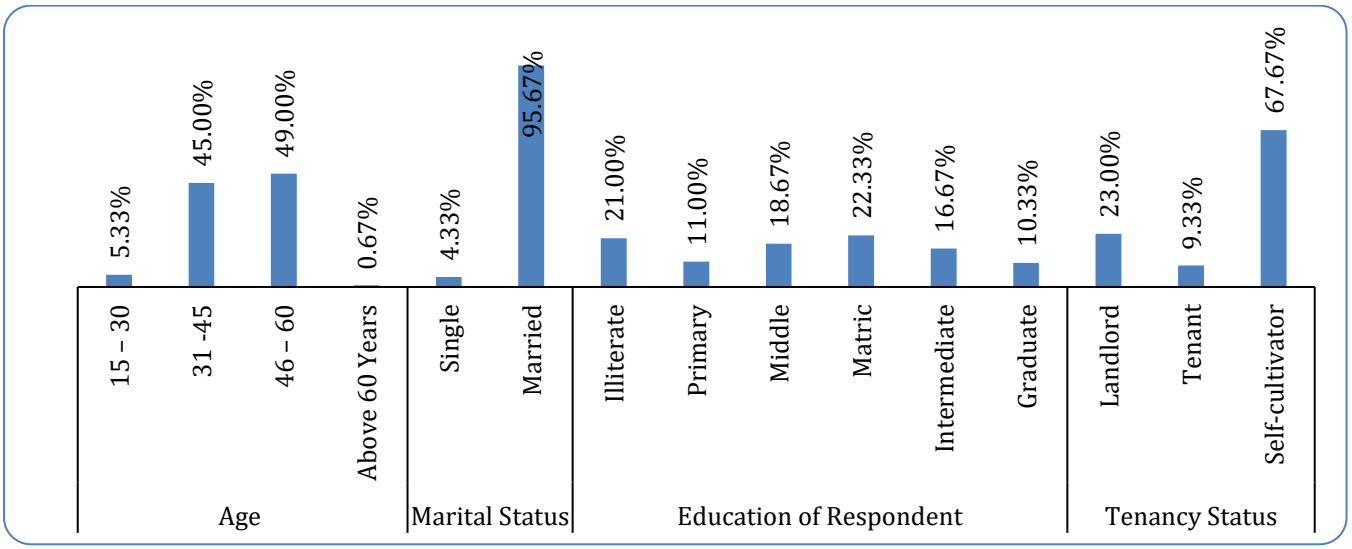


Figure 1. Socio-economic characteristics of respondents.

**Cultivation of Oilseed Crops in Comparison to Other Rabi Crops**

The crops cultivated in the study areas are presented in Table 1. In general, the average cultivated area for the mustard crop was approximately 21.17 acres, while the cultivated area for the sunflower crop was calculated to be 37.50 acres. Cultivated area for wheat was estimated 18.68 acres, and 7.50 acres for sugarcane. In the study area, the total cultivated land for mustard amounted to 6317 acres, while sunflowers occupied 150 acres. Additionally, wheat cultivation covered 4384 acres, and sugar cane crops occupied an area of 90 acres.

Table 1. Cultivation of oilseed crops in comparison to other rabi crops.

| Crop Cultivated | N | Total Cultivated Area | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|---|
| Mustard | 297 | 6317 | 1 | 460 | 21.17 | 43.689 |
| Sunflower | 4 | 150 | 20 | 70 | 37.50 | 23.629 |
| Wheat | 238 | 4384 | 2 | 200 | 18.68 | 27.734 |
| Sugarcane | 12 | 90 | 2 | 20 | 7.50 | 6.599 |
| Total | 552 | 10941 | 1 | 460 | 19.91 | 36.995 |

**Low Rates**

Low rates can indirectly affect crop production by influencing borrowing, spending, and investing, which can impact the profitability of the agricultural sector. Figure 2 depicts that around 52.7% of the participants assigned a "mostly" rating, while 30.7% assigned a "sometimes" rating, and 16.7% of the respondents gave a "not at all" rating about the low rates, which served as a reason for not cultivating oilseed. Consequently, a notable portion of farmers refrained from engaging in oilseed cultivation owing to the issue of low rates, potentially affecting the agricultural sector's profitability. Cultivating oilseed crops holds significance as they serve as a substantial source of oils and proteins, catering to various nutritional and non-edible applications (Kugbei and Shahab, 2007).According to a study conducted by Aftab *et al*. (2021), it was found that the cost of cultivating sunflower is relatively high, while the selling price of the produce is low. As a result, farmers are discouraged from adopting this crop. Farmers are known to be the best economists and tend to choose crops that offer higher returns.

**Low Yield**

Low yield can reduce the profitability and sustainability of oilseed production, as well as the supply and quality of edible oils. When asked about the reasons for farmers neglecting the cultivation of oilseed crops, 59.3% of the respondents answered "mostly," 27% responded with "sometimes," and 13.7% stated "not at all." The primary factor mentioned by the respondents was the low yield of these crops. Oilseed crop growers encounter the task of swiftly improving both their yields and quality, all the while ensuring greater sustainability in crop production to meet the needs of the expanding global population (Attia *et al*., 2021). Farooq *et al.* (2016) investigated that various biotic and abiotic stresses can cause low yield of oilseed crops, which can be a major problem.

**Lack of a Procurement System**

Without a procurement system, oilseed crop production can be significantly affected, and farmers can be deterred from oilseed cultivation due to uncertainty, price volatility, limited credit access, reduced economies of scale, and hindered market development. Most of the participants (45.3%) indicated that the absence of a procurement system played a significant role in their choice against cultivating oilseed crops. Roughly 34% identified it as an intermittent factor, and only 20.7% affirmed that it had no impact on their decision whatsoever. Willy and Njeru. (2014) concludes that procurement performance in institutions is positively influenced by the existence of procurement portfolio, logistics management and compliance with procurement plans. Planning aims to use the available resources to attain the overall goals.

**Shortage of Irrigation**

Water stress is one of the most significant factors influencing plant growth and yield. Approximately 44% of the participants cited a shortage of irrigation water as the primary cause, while an equal percentage of respondents indicated it as occurring occasionally. Additionally, 12% of the participants attributed the absence of irrigation water as not influencing their decision. Many respondents believed that a lack of irrigation water was to blame for the decline in agricultural production and farming. Particularly in arid and semi-arid locations, where irrigated agriculture is necessary for crop development, a lack of irrigation can have a substantial impact on the production of oilseed crops (Rathore *et al.,* 2021). Ebrahimian. *et al.* (2019) examined that the seed yield and oil quality of oilseed crops were affected by the lack of irrigation water.

**Lack of Knowledge**

Due to a lack of information about soil health, crop rotation, managing pests and diseases, and other best practices, farmers may have difficulty putting optimal cultivation practices into effect. In general, 56% of the respondents did not think that a lack of knowledge was at all a factor. Additionally, according to 40% of the respondents, ignorance is sometimes a contributing factor. Only 4% of the respondents thought that the drop in the production of oilseed crops was mostly due to a lack of knowledge. We can conclude that although ignorance influences the choice to grow oilseed crops, it is not seen as the main cause of the decline. The vast majority of responders do not consider it to be a significant constraint.

**CONCLUSION AND RECOMMENDATIONS**

Farmers encounter challenges such as water scarcity and ineffective irrigation methods, leading to adverse effects on oilseed crop yields. Additionally, accessing credit and financial assistance for oilseed cultivation

proves to be problematic for them, challenges in accessing markets and receiving fair prices for oilseed crops can discourage farmers from investing in oilseed cultivation. Many farmers in Pakistan may lack access to modern agricultural practices, techniques, and technology, leading to suboptimal oilseed crop cultivation. Addressing the production issues of oilseed crops requires a holistic approach that includes improving water management, promoting the use of high-quality seeds, enhancing technical knowledge through training and extension services, implementing effective pest and disease control, and ensuring sustainable soil management practices. Enhancing farmers' access to financial resources and markets, along with adopting modern agricultural machinery and techniques, can contribute to the overall improvement of oilseed crop production in the country. The government is advised to offer special incentives to coastal farmers to encourage the cultivation of non-traditional oilseed crops such as coconut and oil palm.

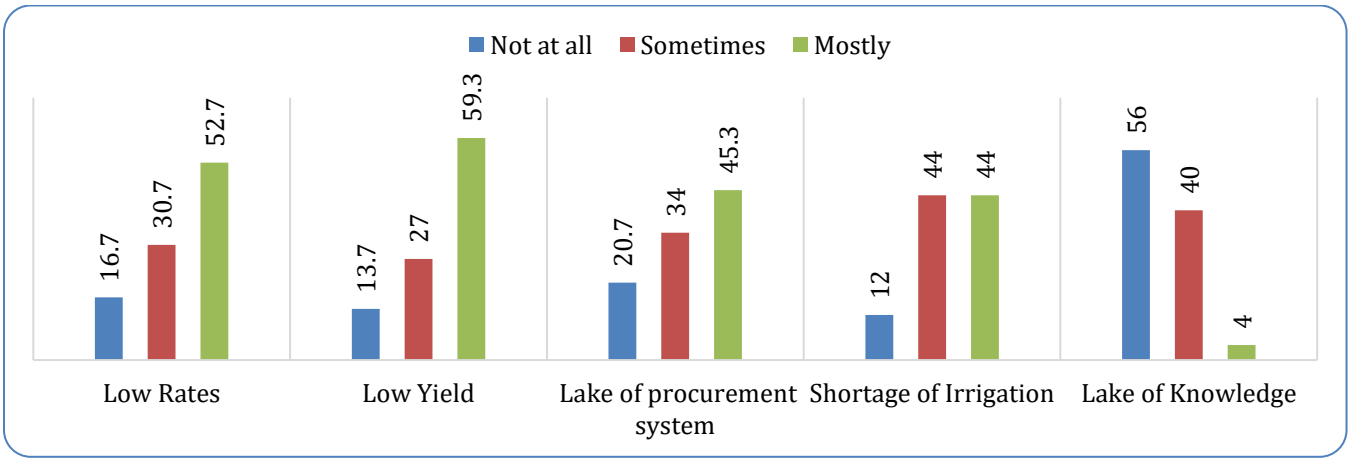


Figure 2. Factors that influence farmers' decisions to cultivate oilseed crops.

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