RELATIVE PROFITABILITY ANALYSIS OF SUNFLOWER IN DISTRICT SWABI AND MARDAN

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ABSTRACT:- Sunflower is one of the most important among edible oil crops growing in Khyber Pakhtunkhwa. It was introduced in the province during 1976 but commercially adopted by a large number of farmers only by 1990's. Sunflower cultivation trend kept on increasing from the year 1990 to 1999. Since then a continuous decreasing trend in adoption of sunflower has been observed. The present research work was planned to estimate the relative cost effectiveness of sunflower with competing crops like sugarcane and tobacco to find out the major factors which caused the decreasing trend of sunflower in the area. Primary data of 100 respondents was collected and analyzed in SPSS (Special Package for Social Scientists) software. Estimated results revealed that there was a key difference among target three crops profitability such as revenue per crop day of tobacco, sugarcane and sunflower were rupees 285.61, rupees 158 .93 and rupees 82.64 respectively. On the whole tobacco and sugarcane both of these crops were more profitable for the farmers. As study results showed that output-input ratio of tobacco were 3.09 followed by 3.01 of sugarcane. While sunflower's output-input ratio was only 1.86, which was very low than both of the competing crops (tobacco and sugarcane). In terms of net profit non-adopters of sunflower were earning more income than adopters of sunflower with lesser profit. This economic benefit in other crops was the major reason for sunflower non-adoption in selected districts of Khyber Pakhtunkhwa.

Key Words: Sunflower; Tobacco; Sugarcane; Profitability; Khyber Pakhtunkhwa

INTRODUCTION

Sunflower (*Helianthus annuas* L.) is one of the most important among edible oil crops. Khyber Pakhtunkhwa (KP), the province of Pakistan has huge area of irrigated and dry land in the high rainfall zones is open for the cultivation of sunflower in the month of June to October. It has an exclusive agronomic atmosphere where growing of double harvests of sunflower in a single year are conceivable by adopting appropriate tradit-ional practices. Some land remains fallow after tobacco, barley, wheat, rapeseed and mustard. Sunflower is the suitable substitute which can fill up this gap as hybrid varieties of sunflower are obtainable that can matured in 90 to 110 days (Bakht et al., 2006).

In Khyber KP sunflower was introduced in the year 1976 but commercially it was adopted by a large number of farmers only by 1990's. During the year 1990 there was an increasing trend of cultivating

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sunflower up to the year 1999. During 1990's the area under sunflower in KP was 2562 hectares with upward and downward trend it reached 5096 hectares during 1999. While after 1999, there was a continuous decreasing trend in adoption of sunflower resulting in just 527 hectares under the crop in the year 2010 (GoP, 1995-96, 2005-06 and 2009-10). However, in case of yield sunflower has a great potential. The yield of sunflower in KP is almost equal to that of Punjab and higher than Sindh for the last ten years. However, in case of area under sunflower, Punjab and Sindh areas are leading (GOP, 2009-10). Currently, Dera Ismail Khan, Swabi and Mardan are leading districts for area and production of sunflower in the province. Considering major producing areas, Swabi and Mardan districts were focused during current study. During the year 2009, the average yield of sunflower in D. I. Khan, Swabi and Mardan districts was 602, 660 and 655 kg/ha respectively (Govt. of KP, 2009). A number of hybrid sunflower varieties such as Hysun 33, SF 187, NKS 278 and NK 265 have been introduced and grown in major sunflower growing districts of Khyber Pakhtunkhwa (Govt.of KP, 2011). Although, numbers of hybrid varieties have been reported in these districts, but the productivity statistics indicate that the adoption of hybrid is unsatisfactory. People used low standard seed that resulted in low productivity despite the fertile land and sufficient water availability (SMEDA, 2009). The specific objective of the study is to find out the comparative profitability of sunflower with competing crops of the selected districts of Khyber Pakhtunkhwa.

MATERIALS AND METHOD

The study was based on primary data source. Swabi and Mardan districts of Khyber Pakhtunkhwa were selected for data collection of 100 respondents. A purposive sampling technique was applied and 100 respondents were interviewed from study area. The reason for purposive sampling was gaining access to respondents who could be interviewed in depth.

Profitability Analysis

To compare the net benefit / income of adopters and non-adopters profitability analysis was employed as was used by Ali (2004). Regarding profitability analysis a number of measures were estimated for sunflower crop like gross revenue, output-input ratio, revenue per rupee of input cost and revenue per crop day per acre. For the comparison the competing crops profitability analysis was also carried out. The gross revenue per acre was calculated as under:

Gross Revenue =
(Yield per Acre * Product Market Price) + (Value of by Products)

The output-input ratio was calculated according to following formula:

Out put-input Ratio =

$$\frac{\text{Gross Reve-nue (Rs/Acre)}}{\text{Gross Cost (Rs/Acre)}}$$

Revenue per Rupee of Input Cost =

$$\frac{\text{Gross Revenue (Rs/Acre)}}{\text{Variable Cost of Input}}$$

Revenue per Crop Day (Per Acre) =

$$\frac{\text{Net Revenue (Rs/Acre)}}{\text{Crop Duration (days)}}$$

RESULTS AND DISCUSSION

Area Allocation to Different Crops

Availability of irrigation water had great expand in the farm activity in the Swabi and Mardan districts of Khyber Pakhtunkhwa. Majority of the farmers have changed their traditional cropping pattern with the high value crops like tobacco, sugarcane, wheat and maize and ignoring minor crops like sunflower. Generally farmers were allocating, major share of their land to tobacco and sugarcane. The sampled growers cultivated 51.75 percent of total area under tobacco and maize, 35.57 percent area was cultivated under sugarcane and wheat, 10.69 percent area under sunflower and remaining 1.99 percent area was for vegetables. Average farm size of sample respondent was reported 3.84 acres. Intercropping sugarcane with wheat is also recorded in data from sampled growers of the study. Details are presented in the table 1.

Table 1. Area Allocation to Different Crops of Sample Respondents (Acres)

Crop	Area	Mean	Percent
Tobacco and maize	198.72	1.98	51.75
Wheat and sugarcane	136.58	1.36	35.57
Sunflower	41.05	0.41	10.69
Vegetables and other	7.64	0.08	1.99
Total	384	3.84	100

Profitability Analysis

Although sunflower is agronomical suitable to all type of soil and climatic conditions, yet farmers were facing problems in adjusting it in their existing cropping pattern. The nature of this problem was purely based on economic benefits of other crops which existed and were capturing the major land such as tobacco, maize and sugarcane. Sowing of sunflower crop started in March and harvested in first week of July. This period overlaps with the sowing and harvesting time of tobacco crop, due to the more profitable venture of tobacco farmers ignore sunflower.

Profitability Analysis of Sunflower

The cost of production of sunflower was lower than other two crops which was rupees 12798 per acre and average income per acre was rupees 23915 per acre. Net profit per acre of sunflower was rupees 11116 per acre. Output/input ratio was 1.86 and revenue per rupee of input cost was 1.97. Revenue per crop day was rupees 82.64 per acre. The average area of sunflower was also lower than other two competing crops of these districts. Details are presented in the table 2.

Table 2. Sunflower Profitability Analysis

Sunflower	Values
Cost of production per acre (Rs.)	12798.04
Income per acre (Rs.)	23915
Net profit per acre (Rs.)	11116.96
Output-input ratio	1.86
Revenue per rupee of input cost	1.97
Revenue per crop day (Rs.)	82.64

Profitability Analysis of Tobacco

Tobacco was major crop of Swabi and Mardan districts of Khyber Pakhtunkhwa. The cost of production was rupees 41316 per acre. Gross revenue was rupees 109862 per acre and net profit was rupees 68546 per acre. Output-input ratio 2.65 and revenue per rupee of input cost was 3.09. Revenue per crop day was rupees 285.61 per acre. Details are presented in the Table 3.

Table 3. **Tobacco Profitability Analysis**

Tobacco	Values
Cost of production per acre (Rs.)	41316.12
Income per acre (Rs.)	109862.20
Net profit per acre (Rs.)	68546.12
Output-input ratio	2.65
Revenue per rupee of input cost	3.09
Revenue per crop day (Rs.)	285.61

Profitability Analysis of Sugarcane

Sugarcane was widely adopted crop in Mardan district of Khyber Pakhtunkhwa. The cost of production was rupees 41822 per acre. Gross revenue was rupees 94269 per acre and net profit was rupees 52446 per acre. Output-input ratio 2.25 and revenue per rupee of input cost was 3.01. Revenue per crop day was rupees 158.93 per acre. Details are presented in the table 4.

Table 4. **Sugarcane Profitability Analysis**

Sugarcane	Values
Cost of production per acre (Rs.)	41822.31
Income per acre (Rs.)	94269.23
Net profit per acre (Rs.)	52446.92
Output-input ratio	2.25
Revenue per rupee of input cost	3.01
Revenue per crop day (Rs.)	158.93

Profitability Comparison of Sunflower with Tobacco and Sugarcane.

In table 5, sunflower was compared with tobacco and sugarcane. The net profit of tobacco was comparatively greater than sunflower and sugarcane. On the whole tobacco and sugarcane both of these crops were more profitable for the farmers. As study results showed that output-input ratio of tobacco were 3.09 followed by 3.01 of sugarcane. While sunflower's output-input ratio was 1.86, which was very low than both of the competing crops (tobacco and sugarcane). Revenue per crop day of tobacco was rupees 285.61 followed by rupees 158 .93 of sugarcane, While sunflower revenue per crop day was just rupee 82.64 which was three times lesser than tobacco and two times lesser than sugarcane.

The above cited description led to the conclusion that major factors which were contributing towards non-adoption of sunflower in Swabi and Mardan districts of Khyber Pakhtunkhwa were the net profits of tobacco and sugarcane that were greater than net profit of sunflower. Revenues per rupee of input cost of tobacco and sugarcane were also providing great venture for farmers compared to sunflower revenue per rupee of cost. In terms of net profit non-adopters of sunflower were earning more income and were at better economic condition compared with the adopters of sunflower with lesser profit that will lead to increase

Table 5. **Profitability Comparison of Sunflower with Tobacco and Sugarcane**

Specification	Sunflower	Tobacco	Sugarcane
Cost of production per acre (Rs.)	12798.04	41316.12	41822.31
Incom e per acre (Rs.)	23915	109862.20	94269.23
Net profit per acre (Rs.)	11116.96	68546.12	52446.92
Output-input ratio	1.86	2.65	2.25
Revenue per rupee of input cost	1.97	3.09	3.01
Revenue per crop day (Rs.)	82.64	285.61	158.93

poverty level in adopters.Details are presented in the table 5.

In district Swabi farmers were growing tobacco and earning enough profit from it. They were not interested in adopting sunflower on large scale due to its low profit margin; situation in Mardan districts was also the same, farmers were growing sugarcane as a cash crop, so the major constraint was profit difference. As profitability results showed rupees 285, 158, and 82 crop profitability per day for tobacco, sugarcane and sunflower respectively. A similar comparison of profitability has been shown by Ashiq and Ahmed (2001). The profitability difference arises due to the low, uncertain price and low yield of the sunflower as compared to other cash crops in the area. Profitability analysis provides influence on farmers for taking decision regarding adoption or non-adoption of crop (Paula et al., 2008). The higher profitability of other crops affects the adoption of sunflower. Similar results have been shown by other studies (Rehman, 1998; Khalil and Jan 2000; Ashiq and Ahmed, 2001).

CONCLUSIONS AND RECOMMENDATIONS

As sunflower has history in this area, it was cultivated on large scale in these areas, so the purpose was to find out the constraints. The study results revealed that the major hurdle on adoption of sunflower was the economic reason. Farmers were earning more profit in tobacco and sunflower and the market price of sunflower was quite low in the area. While there was no market t structure for sunflower output in the area. So, technically, cultivation of sunflower

in these areas is only possible if government provide incentives in economic form for the adoption of sunflower. Research efforts should be made to overcome the problems faced by sunflower growers and increase the area under sunflower. Farmers are not fully aware of the production proficiency of the sunflower which affects yield of sunflower. Therefore, Extension department should deliver technical assistance to the farmers concerning to the production technology.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

S.No	Author Name	Contribution to the paper
1.	Ms. Nusrat Habib	Concived the idea, Overall management of the article, Technical input at every step, Wrote Abstract, Methodology, Did SPSS Analysis, Data Collection, Result and Discussion, Introduction References