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Analysis of Constraints Faced by Sugarcane Growers in Haryana, India

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Authors' contributions

This work was carried out in collaboration among all authors. Author DA conceptualized, analysed and interpreted the data. Author PKC encouraged, supervised the findings and finalized the manuscript. Author Shubham reviewed the final manuscript. The authors approve of the content of the manuscript and agree to be held accountable for the work. All authors read and approved the final manuscript.

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ABSTRACT

Sugarcane is one of the most important cash crop globally. In Haryana, particularly in the districts of Yamuna Nagar, Kaithal, and Rohtak, sugarcane production is significant. However, the adoption of production technology among sugarcane growers in these areas faces various constraints, impacting productivity and profitability. This study aims to identify the constraints faced by sugarcane growers in adopting production technology in Haryana. In order to gather information about the difficulties sugarcane growers had in implementing the production technique, structured interviews were conducted in 2023. The findings indicate that a majority of sugarcane growers

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(56.70%) experienced medium constraints, while 22.50% and 20.80% faced high and low constraints, respectively. Key constraints identified include high labor charges during harvesting, elevated transportation costs, labor shortages during peak periods, variability in agro-climatic conditions, and high prices of plant protection chemicals. The findings underscore the need for targeted interventions, such as awareness campaigns, improved supply chains, affordability of inputs, and pest management strategies, to enhance sugarcane production in Haryana.

Keywords: Constraints; sugarcane production technology; sugarcane growers; challenges.

1. INTRODUCTION

Sugarcane (*Saccharum officinarum*) is one of the most significant crops in the world, producing a substantial amount of sugar, bioenergy, and other byproducts. Although sugarcane is cultivated in numerous countries throughout the world, Brazil, India, China, and Thailand are the top producers. India's largest agro-industrial crop, sugarcane, takes up a staggering 4.85 million hectares of the nation's land [1]. The average cane yield in India is approximately 73.00 tonnes per hectare, with a sugar recovery rate of around 10.00 per cent. However, there is potential for increasing the average cane yield to 100 tonnes per hectare and the sugar recovery rate to 11.00 per cent through the transfer of new technologies to farmers' fields [2]. Due to the enormous potential for generating sugar and other byproducts of sugarcane for the domestic market, it is the most important cash crop in the nation.

Haryana, located in northern India, is known for its agricultural productivity, and sugarcane is an important crop in the state with an average yield of 86.18 tonnes per hectare of sugarcane despite of having harsh weather conditions in the state [3]. Haryana comprises a total area of 99.00 thousand hectares under sugarcane with a reported production of 858.00 thousand tonnes in the year 2020-21 [1]. There is potential to increase the sugarcane production in Haryana, but the trend has rather been constant over the years showing no drastic increase. Hence, there was a necessity to examine the issues and hurdles encountered by sugarcane growers, which could then serve as a valuable asset for researchers, extension personnel, and policymakers aiming to enhance sugarcane production in Haryana.

The goal of this study is to identify the many obstacles that Haryana's sugarcane producers face while using new technologies for sugarcane production. The objective is to successfully overcome these barriers in order to promote higher adoption rates and increase the state's sugarcane production and productivity.

2. METHODOLOGY

Among the 22 districts in the state of Haryana, the study purposively chose three districts namely Yamuna Nagar, Kaithal, and Rohtak. One block was chosen at random from each of the three selected districts and further, two villages from each block were selected randomly.

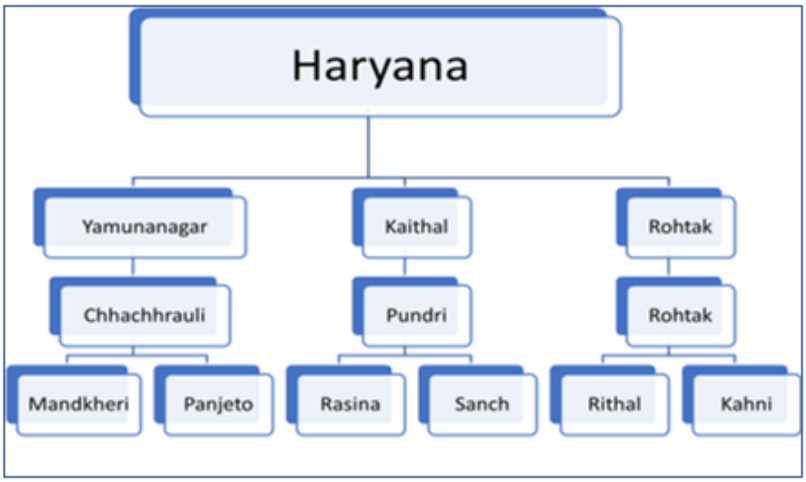

Fig. 1. 22 districts in the state of Haryana

Mand Kheri and Panjeto selected from Chhachhrauli, Rasina and Sanch selected from Pundri, Rithal and Kahni selected from Rohtak block. Twenty farmers from each of the six villages were randomly selected as shown in Fig. 1. Hence, a total of 120 farmers were selected as a sample for the present study and interviewed to gather data on the constraints they faced in adopting sugarcane production technology.

The operational definition of constraints is the challenges farmers face while using new technologies for sugarcane production. A total of 16 constraints faced by the farmers were taken in the present study which were related to inputs, marketing, production, technical guidance etc. Each constraint was categorized in three categories. Constraints perceived by the farmer as 'not so serious' were awarded a score of 1, 'serious' constraints were awarded a score of 2, and 'very serious' were awarded a score of 3. To analyse the constraints statistical tools like total weighted score and weighted mean score were used.

3. RESULTS AND DISCUSSION

Constraints faced by sugarcane growers: Analysis of the data presented in Table 1 shows that 56.70 percent of the respondents were classified under the medium constraint category, while 22.50 percent encountered high levels of constraints. A smaller proportion, 20.80 percent, experienced low constraints. These results suggest that a significant number of sugarcane growing farmers encounter moderate to high levels of challenges in their cultivation practices. Addressing these constraints through targeted interventions, such as providing improved access to resources, training on pest and disease management, promoting risk mitigation strategies, and facilitating market linkages, can help alleviate the challenges faced by sugarcane growing farmers and improve their overall productivity and profitability. Godara et al. [4] also obtained similar results.

Input constraints as shown in Table 2 clearly shows that high labour charges and unavailability of labour at peak time were the key problems faced by the farmers which were followed by high prices for plant protection chemicals and a lack of funding for input purchases. The respondents ranked the lack of quality seed and delayed input availability as the least important constraints they encountered. The results are found in line with Nirmala & Muthuraman [5], Lahoti et. al. [6], Desai et. al. (2020), Godara et. al. [4], Vishwakarma et. al. [7] and Noopur et. al. [8].

Table 3 shows that the biggest marketing constraints were either high transportation costs or a lack of facilities for the produce, followed by a lack of guidance regarding the best time and location for marketing, and the least effective marketing constraints were low support prices and low produce returns. Similar results are obtained by Katke & Deshmukh (2012), Rai et. al. [9], Ahmed et. al. [10] and Kandpal [11].

Among the constraints related to production (Table 4), uneven agro-climatic conditions, followed by lack of skill-based trainings were main constraints, while lack of proper cropping sequence, problem of stray animals were the least serious constraints. These findings are in line with the findings of Rai et. al. [9] and Vishwakarma et. al. [7].

In case of constraints related to technical guidance (Table 5), lack of knowledge about the current advances in sugarcane cultivation ranked I which was followed by lack of guidance for pest and disease control and lack of guidance for selecting cultivars and fertilizer application. Similar results were obtained by Singh et. al. [12], Lahoti et al. [6], Khandre et al. [13], Ahmed et. al. [10], Vishwakarma et. al. [7] in their respective studies regarding sugarcane production technology.

Suggestions to mitigate the problems faced by the farmers: Several strategies can be employed to address the challenges encountered by the sugarcane growers. Addressing labor constraints requires a multifaceted approach. Skill development programs can enhance labor efficiency [14] while mechanization can reduce the reliance on manual labor. Forming labor cooperatives allows for resource-sharing during peak seasons. High input costs can be mitigated through government subsidies on seeds, fertilizers, and pesticides. Measures can also be taken to raise awareness [15] and adoption of bio-pesticides and insecticides for sustainable sugarcane production. Promoting organic farming methods, which often require fewer inputs, is also beneficial. Appropriate supply and value chain measures such as good transport and market facilities should be created for farmer to fetch higher prices and reduce wastage. Tackling marketing challenges will include establishing better market linkages and providing

Table 1. Distribution of the respondents on the basis of overall constraints perceived (n=120)

S. No.	Categories	Frequency	Percentage
1	Low (<26.27)	25	20.80
2	Medium (26.27-30.48)	68	56.70
3	High (>30.48)	27	22.50

Table 2. Constraints related to inputs

S. No.	Particular	TWS	WMS	Rank
1	High labour charges during harvesting	354	2.95	I
2	Labour shortages at peak time	294	2.45	II
3	High price of insecticides/pesticides and fungicides	240	2.00	III
4	Lack of finance for purchase of inputs	222	1.85	IV
5	Non availability of quality seed	150	1.25	V
6	Non availability of inputs at proper time	120	1.00	VI

Table 3. Constraints related to marketing

S. No.	Particular	TWS	WMS	Rank
1	Lack of transport facilities and disposal of produce/ High transportation charges	300	2.5	I
2	Lack of guidance for proper time and place for marketing	234	1.95	II
3	Low FRP and SAP for the produce/ Low returns	228	1.90	III

Table 4. Constraints related to production

S. No.	Particular	TWS	WMS	Rank
1	Uneven agro-climatic conditions	246	2.05	I
2	Farmer and labour are not skilled due to lack of trainings	156	1.30	II
3	Lack of proper cropping sequence followed by farmers	139	1.16	III
4	Problem of stray animals	133	1.11	IV

Table 5. Constraints related to technical guidance

S. No.	Particular	TWS	WMS	Rank
1	Lack of knowledge of current advances for sugarcane cultivation	234	1.95	I
2	Lack of guidance for controlling insect-pest and disease and application of insecticides/pesticides and fungicides	201	1.67	II
3	Lack of guidance for selecting cultivars and fertilizer application	154	1.28	III

real-time price information to farmers. Given the agro-climatic variability, encouraging crop diversification and promoting climate-resilient varieties can mitigate risks associated with changing weather patterns. Measures should be taken to improve technical guidance by strengthening agricultural extension services, educating farmers about integrated pest management, and emphasizing soil health management. Additionally, ensuring financial inclusion through accessible credit facilities [16-18] and promoting crop insurance schemes is crucial. Collaborative efforts from policymakers, experts, and farmers are essential for effective implementation of these suggestions.

4. CONCLUSION

Addressing the problems faced by sugarcane farmers needs a big plan that covers everything from how they grow crops to how they sell them. By teaching farmers new skills, using machines more, and providing subsidies on seeds and fertilizers, we can make sugarcane farming better. Also, helping farmers find better ways to sell their crops and dealing with changes in weather can make a big difference. It's important

for everyone involved like government, experts, and farmers to work together to make these changes happen. This will help sugarcane farming become stronger and more successful in the long run.

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DATA AVAILABILITY

Data would be made available on request.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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