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Constraints and suggestions of cotton growers on farm mechanization

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Abstract

The present study was conducted in Western Vidarbha of Maharashtra state to analyze the constraints faced by the farmers in use of farm machinery and suggestions to overcome the constraints. The study was conducted with a sample of 200 farmers. cotton picking operation is still not mechanized, lack of suitable machines for different farm operation, care and maintenance facilities are not available at local place, farm machinery and equipment not suitable to diverse soil type and farm size, despite financial support under various schemes, improved farm implements and machineries are expensive to buy and maintain, intercultural operation like hoeing is not possible in full grown crops through, mechanization, heavy machinery can compact soil, harming soil health and crop yields and poor field road prevents the use of machinery in rainy season. Regarding suggestions machinery for cotton picking need to be developed, provision of more subsidies and high credit at low interest rate for buying tractors and power tillers should be made, customized machineries are needed for intercultural operation, there is need to encourage of repair centers by providing proper training and financial support, availability of fuel in the vicinity may facilitate the use of tractors and machineries, taxes on purchase of tractors and machineries should be waived off, number of custom hiring centre should be increased, training and workshops need to be organized to increase awareness and adoption. These recommendations highlight the urgent need for improved machinery, financial support, and infrastructure in cotton farming with significant barriers needing to be addressed.

Keywords: Mechanization, cotton growers, constraints and suggestions

Introduction

Agricultural mechanization implies the use of various power sources and improved farm tools and equipment, with a view to reduce drudgery of human being and draught animals, enhance the cropping intensity, precision and timeliness of efficiency of utilization of various crop inputs and reduce the losses at different stages of crop production According to Dr. V. Narayanasamy (2013) ^[10], in his book "Farm Machinery and Equipment," farm mechanization refers to the application of engineering principles to agricultural production systems in order to make farming operations more efficient, productive, and sustainable."

Mechanization offers several advantages, including a reduction in inputs like seeds and fertilizers by 15-20%, a decrease in labour requirements and operational time by 20-30 percent, an increase in cropping intensity by 5-20 percent, and a boost in crop productivity by 10-15 percent. Indian farmers are currently adopting farm mechanization at a faster rate compared to the recent past. (Nagraj *et al.* 2013) ^[11].

The end objective of farm mechanization is to enhance the overall productivity and production with lowest cost of production. It is one of the good alternatives to farmers, who aim to get a higher income. Apart from the increase in

production from farm mechanization sector is plagued by various challenges related to timeliness of operation labour scarcity, labour wages, time saving, efficiency and effectiveness in work, increasing farming expenditure and drudgery faced by farmers in performing different farm operation.

Material and Methods

The study was conducted with an exploratory research design to assess the constraints and suggestions perceived by the cotton grower to overcome the constraints on mechanization. The western Vidarbha region of Maharashtra state comprises five districts of namely Buldana, Akola, Amravati, Washim, Yavatmal were selected. The list of talukas were obtained from district superintendent agriculture officer in which the area under cotton cultivation was more and where tractors, machineries and improved tools were distributed through various schemes was selected. On the basis of maximum beneficiaries 2 talukas were selected from each district. The list of villages were obtained from the Taluka Agricultural Officer (TAO) which is the beneficiaries of various schemes under mechanization and possess more area under cotton cultivation likewise forty villages were selected from ten

talukas. Selection of farmers on the basis, farmers using improved farm & machineries from last 3 years either benefitted under the scheme or using it on hiring basis were selected as user of mechanized farming. Five cotton growers

from each village, likewise 200 user respondents were selected for the study.

Result

Table 1: Constraints faced by the cotton growers on mechanization

Sr. No	Constraints	Frequency & Percentage	Rank
1	Cotton picking operation is still not mechanized	134 (67.00)	I
2	Lack of suitable machines for different farm operation	122 (61.00)	II
3	Care and maintenance facilities are not available at local place	114 (57.00)	III
4	Farm machinery and equipment not suitable to diverse soil type and farm size	105 (52.50)	IV
5	Despite financial support under various schemes, improved farm implements and machineries are expensive to buy and maintain	101 (50.50)	V
6	Intercultural operation like hoeing is not possible in full grown crops through mechanization	87 (43.50)	VI
7	Heavy machinery can compact soil, harming soil health and crop yields	154 (38.50)	VII
8	Poor field road prevents the use of machinery in rainy season	77 (30.50)	VIII

From the Table 1, it is noticed that, 67.00 percent of non-users encountered challenges because cotton picking operations had not yet been mechanized. As a labor-intensive process, cotton picking was especially difficult due to labor shortages during the peak season. These delays in harvesting often led to a decline in cotton quality. Moreover, 61.00% of respondents pointed out the lack of appropriate machinery for various farm tasks like rotary weeder for weeding, which require labor to keep fields weed-free for up to two months. The availability of maintenance and repair services was a concern for 57.00 percent of respondents, as these facilities were not available locally. Most repair centers were outside the villages, making them difficult to reach during emergencies, especially with poor infrastructure. 52.50 percent of respondents noted that farm machinery and equipment were not suitable for different soil types and farm sizes.

Additionally, despite with financial assistance from various schemes, 50.50% of respondents found that the high cost of improved farm implements and machinery made them too expensive to purchase and maintain, due to non availability of capital to buy them. 43.50 percent of the respondents were having constraints like intercultural operations like hoeing were also challenging to mechanize in fully grown crops due to the potential risk of damaging the cotton crop at later stages. 38.50 percent experience heavy machinery further posed issues by compacting the soil, which could harm soil health and crop yields. The weight of the machinery could reduce soil porosity, affecting the germination rate of cotton crops. Lastly, 30.50 percent of them faced difficulties due to poor field road conditions, which hindered the use of machinery during the rainy season.

Table 2: Suggestion given by cotton grower to overcome constraints

Sr. No.	Suggestions (User)	Frequency & Percentage	Rank
1	Machinery for cotton picking need to be developed	148 (74.00)	I
2	Provision of more subsidies and high credit at low interest rate for buying tractors and power tillers should be made	129 (64.50)	II
3	Customized machineries are needed for intercultural operation	114 (57.00)	III
4	There is need to encourage of repair centers by providing proper training and financial support	88 (44.00)	IV
5	Availability of fuel in the vicinity may facilitate the use of tractors and machineries	62 (31.00)	V
6	Taxes on purchase of tractors and machineries should be waved off	58 (29.00)	VI
7	Number of custom hiring centre should be increased	55 (27.50)	VII
8	Training and workshops need to be organized to increase awareness and adoption	26 (13.00)	VIII

From the Table 2, the data highlights key suggestions from respondents to improve cotton farming. A significant 74.00 percent were emphasized the need for specialized cotton-

picking machinery. Additionally, 64.50 percent called for more subsidies and low-interest credit for tractors and power tillers, addressing financial barriers to acquiring

essential equipment. Customized machinery for intercultural operations was prioritized by 57.00 percent of respondents, reflecting the need for equipment tailored to specific crops and soil conditions. Moreover, 44.00 percent suggested establishing more repair centers with proper training and financial support, underscoring the importance of maintenance services. Fuel availability was a concern for 31.00 percent of the respondents, while 29.00 percent recommended waiving taxes on machinery purchases to make equipment more affordable. Additionally, 27.50 percent advocated for increasing custom hiring centers to provide access to machinery on a rental basis. Finally, 13.00 percent of them were suggested conducting training and workshops to raise awareness and adoption of new technologies. Overall, the suggestions highlight a strong demand for better machinery, financial support, and infrastructure to enhance cotton farming, with significant barriers needing to be addressed.

Conclusion

The study revealed that, during peak time of farm operations, such as cotton weeding and harvesting, there is a lack of developed farm implements and machinery. Farmers also often do not have the capital to invest in advanced equipment. To address these issues, the government should prioritize the development of cotton-picking machinery and rotary weeder, increase subsidies, and provide high credit at low-interest rates for purchasing tractors and power tillers. Additionally, there is a need for customized machinery for intercultural operations and support for repair centers through proper training and financial assistance. These recommendations highlight the urgent need for improved machinery, financial support, and infrastructure in cotton farming with significant barriers needing to be addressed.

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