Original Research Article

UNRAVELLING THE CHALLENGES IN COTTON PROCESSING INDUSTRIES: A COMPREHENSIVE CONSTRAINT ANALYSIS

ABSTRACT

Aims: The study aimed to examine and record the challenges faced by the cotton processing industries.
Study Design: Study employed purposive and random method of sampling for the selection of districts and respondents respectively.
Place and Duration of Study: The study was carried out in Adilabad and Nalgonda districts of Telangana state in the year 2021-22.
Methodology: The required data was gathered from a sample size of 10 ginning mills, 10 spinning mills, 10 weaving mills, one dyeing and printing mill and one garment manufacturing by utilizing the personal interview. To analyze the collected data Garrett ranking methodology was employed.
Results: The research found that, higher cost of machinery, higher rate of interest, exorbitant prices of raw material, underutilization of installed capacity, higher working capital requirement, shortage of electricity, lack of technical human resource, competition from the big and organized sector and lack of marketing cooperatives were the major problem faced by the processing units of cotton.
Conclusion: In light of this, the report suggests that the government provide subsidies for the purchase of machinery, at least for small-scale businesses, impart training to the youth and establishment of marketing cooperative at every successive stage of the cotton processing.

Key words: Cotton processing, Constraint, Garrett ranking, Ginning, Weaving

INTRODUCTION

India is the largest producer of cotton in the globe. The crop which is vital to both economy and the life of cotton farmers. [1]. Cotton in India is grown on more than 13.06 million hectares compared to 32.21 million hectares worldwide [2]. After agriculture, second largest employment is generated by the cotton textiles sector in the nation, supporting the livelihoods of an estimated 6.5 million cotton farmers and also contributing to sizable export market [3&4].

During the cotton season 2022–2023, an estimated 343.47 lakh bales were produced. Domestic consumption was estimated at 311.17 lakh bales in the financial year 2022-23. By 2030, India's anticipated cotton production would be 423.52 lakh bales, spurred by rising consumer demand. Gujarat, Maharashtra and Telangana are the three major cotton producing states in the country. Telangana state producing the highest cotton in the Southern Zone and the third largest in the country, contributing 53.13 lakh bales [2&5].

Cotton supplies two important products namely, cotton fibre and cotton seed. Separation of cotton fibre from the seed takes place at the ginning stage [6]. It is the first stage of the cotton processing. The obtained fibre from the ginning process is called as lint. The percentage of lint obtained from the seed

cotton is called as ginning out turn ratio, which ranges from 33-42 per cent and it depends on cotton cultivar and environmental conditions [7,8]. After ginning process, the leftover seed is called as fuzzy cotton seed which may be used directly for feeding of adult cattle or further processed into different by-products like seed meal (45%), hull (26%), oil (16%) and linter (9%) while remaining 4 per cent is lost during processing [9].

Following the ginning process, the next processes are spinning (the process of turning lint into yarn), weaving (the process of turning yarn into greige fabric), dying and printing (the process of turning greige fabric into finished fabric), and lastly garment manufacture (the process of turning finished fabric into various readymade garments). These processing plants are crucial links in the cotton industry's value chain [10].

However, the low productivity, which is primarily the result of subpar farming practices, limits the total expansion of the cotton business. Due to a shortage of seed cotton, processing units are forced to work below capacity, which negatively impacts every step of the value chain. Currently ginning units are working only for 4-7 months in a year. Thus, increasing the cost of processing and lowering the competitive edge of processing units. Due to these complexities and interdependence, processing units are facing some constraints. Therefore, it is necessary to research, record, and identify every constraint faced by the processing units in order to come up with a solution.

2. MATERIAL AND METHODS

The study was carried out in Adilabad and Nalgonda districts of Telangana state. The districts were specifically chosen because the concentration of processing units was more in these areas. To gather the required primary data, a sample of 10 ginning mills, 10 spinning mills, 10 weaving mills, 1 dyeing and printing mill, and 1 garment production unit were chosen. All of these respondents were interviewed in-person utilizing a carefully prepared schedule to collect the data.

2.1 Garrett's Ranking Technique

To find out the most pressing constraints encountered by the cotton processing industries,Garrett's ranking method was used. Respondents were assigned ranksto the constraints faced by them, rank one meant most important and last rank meant least important constraint. Then, the rank assigned to each constraint by each individual processor was changedto percent position by make use of the percent position formula. The estimated percent positions were translated into scores using Garrett's table which was given by Garrett and Woodworth. Then the mean values of the scores were calculated. Then finally constraints were ranked according the estimated mean values [11,12]

$$\text{Percent position} = \frac{100 \times (R_{ij} - 0.50)}{N_j}$$

Where,

R_{ij}=Rank given for the i^{th} constraint (i= 1, 2……n) by the j^{th} individual (j = 1, 2 ….. n)

N_j = Number of constraints ranked by j^{th} individual.

3. RESULTS AND DISCUSSION

The basic details of sample processing units such as recovery percentage of main and by-product, actual production and average capacity utilization are given in the Table 1. The constraints faced by the different processing units, ginning, spinning weaving, dyeing and garment manufacturing were depicted in the Table 2.

3.1Details About Sample Processing Units

As depicted in the Table 1 during the ginning process the percentage of lint recovery from the seed cotton is called as ginning out turn ratio which was about 33.00 per cent and sees recovery was about 65.00 percent and the remaining 2 percent is the wastage. Actual production of the sample ginning mills was 375 bales per day and average capacity utilization of the mills was 42.73 percent. During spinning process 75.00 percent of fine yarn and 25.00 per cent of yarn wastage obtained and actual production of the sample spinning mills was 135.29 q yarn/day and average capacity utilization was 83.15 percent.

Table 1 Details of processing units of cotton

S. No	Particulars	Ginning mill	Spinning mill	Weaving mill	Dyeing mill	Garment manufacturing unit
1	Main product recovery (%)	33.00%	75.00%	97.00 %	100 %	99 %
2	By product recovery (%)	65.00%	25.00%	3.00%	-	1%
3	Actual production	375 bale/day	135.29 q yarn/day	635.12m fabric/ day	-	165 shirts/day
4	Average capacity utilization	42.73 %	83.15%	53.28 %	24.66%	27.39 %

Whereas during weaving process, 97.00 percent of fabric and 3.00 percent of wastage was obtained during the weaving process. The actual production of the sample weaving mills was 635.12 meters fabric per day and estimated average capacity utilization was about 53.28 percent and during dyeing and printing the product recovery is 100.00 percent and capacity utilization of the selected dyeing mill is only 24.66 percent. While during garment production 99 percent of the main product was obtained and 1 per cent was the wastage. Actual production of the selected garment manufacturing unit was 165 shirts per day and capacity utilization was just around 27.39 percent.

3.2. Constraints Perceived Cotton Processing Units in The Study Area

The constraints were studied under 5 different categories starting from plant installation to marketing of the product which they have produced. Under each category respondents assigned ranks to the constraints faced by them and the same was analyzed by employing Garrett ranking technique. The results of the analysis are depicted in Table 2

3.2.1Constraints Faced at The Time of Plant Installation

Majorly five constraints were listed under this category and ranked based on the Garrett means score. The data in the Table 2 reveals that high cost of the machinery observed as the most serious constraints for all processing industries namely ginning, spinning, weaving and dyeing and garment manufacturing with the mean score of 60.50, 62.50, 69.00, 75.00 and 75.00 respectively. The next main problem for ginning, spinning and weaving industries was high price of the land with the mean score of 60.50, 62.50 and 66.00 respectively, while dyers and garment manufacture ranked lack of technical know-how and problem in getting the power connection as their second major constraints respectively. The constraint cumbersome procedure for getting licence is considered as lower order constraint by the processing industries.

3.2.2 Constraints Related to Financial Arrangement

The major financial constraints for the ginners were higher rates of interest followed by insufficient finance from the institutions with the means score of 67.90 and 55.80. While, for spinners the prime problems were lack of subsidies and grants by the government and higher tax rate on raw material with the mean score of 66.70 and 55.30 respectively. Again, higher interest rate was the most important constraint for weavers, dyers and garment manufactures with the mean score of 69.60, 73.00 and 73.00 respectively. Second major problem for the weavers was insufficient finance from the government (59.40) while for dyers and garment manufactures lack of subsidies and grants by the government (56.00) was the second major constraint. The above results were in accordance with the[13] reported insufficient investment, improper quality control system, high cost of production, high interest rate and souring electricity prices were the main constraints of the ginning mills.

3.2.3 Constraints Faced in Procurement of Raw Material

Table 2 highlights that the first major constraint for all processors, ginners, spinners, weavers, dyers and garment manufactures was high price of raw material with the mean score of 60.40, 67.90, 69.60, 73.00 and 73.00 respectively. The next vital problem for all processing units except spinners was lack of undisturbed supply of the raw materials while for spinners lack of quality raw material (57.00) was the second major problem. The problem of higher marketing charges and cost is perceived as least bothered constraint by the processing units. The similar results were observed in the research conducted by [14] reported fluctuation in the prices, raw materials shortage and liquidity problem were the significant problems of the spinning mills.

3.2.4 Constraints faced during processing

The results regarding the constraints faced during processing were evident in the Table 2. The data in the table shows that the major problems for ginners were underutilization of processing unit with the score of 68.00 followed by the high rate of electricity and fuel with the mean score of 66.00. However, the major problem for spinners were high working capital followed by the lack of technical human resource with the mean score of 70.50 and 62.00 respectively. While weavers confronted by shortage of electricity and lack of technical human resource with mean score 69.00 and 66.00 respectively. The dyers and garment manufacture majorly facing lack of technical human resources (75.00) and higher working capital (60.00) issues with the processing. The study conducted by [15] reported inadequate supply of properly trained staff, difficulties in obtaining work permits, and insufficient capital as a major problem for garment manufacturing units.

Table 2: Constraints perceived by the cotton processing industries in the study area.

S. No.	Constraints perceived by the cotton ginners and spinners	Mean score (Ginners)	Rank	Mean score (Spinners)	Rank	Mean score (Weavers)	Rank	Mean score (dyers)	Rank	Mean score (Garment manufacture)	Rank
Constraints faced at the time of plant installation											
1	High price of land	60.70	Ⅱ	62.50	Ⅱ	66.00	Ⅱ	40.00	Ⅳ	50.00	Ⅲ
2	Lack of technical know-how	44.70	Ⅳ	51.00	Ⅲ	48.00	Ⅲ	60.00	Ⅱ	40.00	Ⅳ
3	High cost of machinery	68.00	Ⅰ	70.50	Ⅰ	69.00	Ⅰ	75.00	Ⅰ	75.00	Ⅰ
4	Problem in getting power connection	47.30	Ⅲ	37.80	Ⅳ	38.80	Ⅳ	50.00	Ⅲ	60.00	Ⅱ
5	Cumbersome procedure for getting licence	28.80	Ⅴ	27.20	Ⅴ	27.20	Ⅴ	24.00	Ⅴ	24.00	Ⅴ
Constraints related to financial arrangement											
1	Higher rates of interest	67.90	Ⅰ	35.00	Ⅳ	60.00	Ⅱ	40.00	Ⅳ	50.00	Ⅲ
2	Insufficient finances from institutions	55.80	Ⅱ	43.00	Ⅲ	48.00	Ⅲ	60.00	Ⅱ	40.00	Ⅳ
3	Lack of subsidies and grants by government	35.00	Ⅳ	66.70	Ⅰ	69.00	Ⅰ	75.00	Ⅰ	75.00	Ⅰ
4	Higher tax rate on raw material purchased from market	41.30	Ⅲ	55.30	Ⅱ	38.80	Ⅳ	50.00	Ⅲ	60.00	Ⅱ
Constraints faced in procurement of raw material											
1	Lack of assured supply of raw material	58.70	Ⅱ	44.70	Ⅲ	59.40	Ⅱ	56.00	Ⅱ	56.00	Ⅱ
2	Higher rates of raw material	60.40	Ⅰ	67.90	Ⅰ	69.60	Ⅰ	73.00	Ⅰ	73.00	Ⅰ
3	Higher marketing charges and cost	35.00	Ⅳ	30.40	Ⅳ	33.80	Ⅳ	27.00	Ⅳ	44.00	Ⅲ
4	Lack of quality of raw material	45.90	Ⅲ	57.00	Ⅱ	37.20	Ⅲ	44.00	Ⅲ	27.00	Ⅳ

Table 2. cont…

S. No.	Constraints perceived by the cotton ginners and spinners	Mean score (Ginners)	Rank	Mean score (Spinners)	Rank	Mean score (Weavers)	Rank	Mean score (dyers)	Rank	Mean score (Garment manufacture)	Rank
Constraints faced during processing											
1.	Shortage of electricity	40.20	Ⅳ	27.20	Ⅴ	69.00	Ⅰ	24.00	Ⅴ	40.00	Ⅳ
2.	Underutilization of installed capacity of unit	68.00	Ⅰ	37.80	Ⅳ	30.40	Ⅴ	40.00	Ⅳ	24.00	Ⅴ
3.	Higher rate of electricity and fuel	66.00	Ⅱ	51.50	Ⅲ	50.00	Ⅲ	50.00	Ⅲ	50.00	Ⅲ
4.	Higher working capital	44.40	Ⅲ	70.50	Ⅰ	33.60	Ⅳ	60.00	Ⅱ	60.00	Ⅱ
5.	Lack of technical human resource	30.40	Ⅴ	62.00	Ⅱ	66.00	Ⅱ	75.00	Ⅰ	75.00	Ⅰ
Constraints faced in marketing of final products											
1.	Lack of efficient market for final produce	50.50	Ⅲ	58.70	Ⅱ	51.20	Ⅲ	44.00	Ⅲ	44.00	Ⅲ
2.	Competition from big players and organized	63.80	Ⅰ	51.70	Ⅲ	63.80	Ⅰ	73.00	Ⅰ	73.00	Ⅰ
3.	Lack of marketing cooperative	58.70	Ⅱ	62.60	Ⅰ	60.40	Ⅱ	56.00	Ⅱ	56.00	Ⅱ
4.	Non-availability of efficient transport by road	27.00	Ⅳ	27.00	Ⅳ	27.00	Ⅳ	27.00	Ⅳ	27.00	Ⅳ

3.2.5 Constraints Faced in Marketing of Final Products

It is apparent from the Table 2, The first major problem for ginners, weavers, dyers and garment manufactures was competition from big players and organized sector with the mean score of 63.80, 63.00 73.00 and 73.00 respectively followed by absences of marketing cooperative with the mean score of 58.70, 60.40,56.00and 56.00 respectively. However, for the spinners,absence of marketing cooperatives and lack efficient market for the final produce were the crucial problem with the mean score of 62.60 and 58.70 respectively. The constraint non-availability of efficient transport by road was given last rank by the processing industries.The study done by [16] reported the major challenges of power loom industry were lack of proper marketing facilities, lack of management skills, irregular power cuts and shortage of raw material.

4. CONCLUSION

Every processing units of cotton reported high-cost machinery and high price of land as the major constraints at the time of plant installation. Therefore, the government should provide subsidies for purchase of the machinery at least for small sized units and allocate the site on rent basis for establishment of these units. Also train the youth to develop the skillset for running the established plants and bankable projects to encourage youth to start up local processing units.

Liberal credit policy with lesser interest rate needs to be taken up to enable processing units to tackle any unforeseen situations. Marketing cooperative can be established at every successive stage of the processing for hassle free marketing of their final good and increase the bargaining capacity of the processors. The database of processing industries which engaged in the value chain of cotton should be strengthened through regular surveys, so that suitable input for policy framework can be obtained by the government whenever it is necessary.

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